

Bernardsville Master Plan Components

Comprehensive Master Plan - Adopted 9/28/00, Amended 10/28/04

Stormwater Management Plan Amendment - Adopted 3/3/05

Resolution amending Master Plan - Adopted 3/3/05

2006 Master Plan Reexamination - Adopted 1/25/07

Housing Plan Element and Fair Share Plan - Adopted 5/20/10

**COMPREHENSIVE MASTER PLAN
BOROUGH OF BERNARDSVILLE
SOMERSET COUNTY, NJ**

Prepared by:

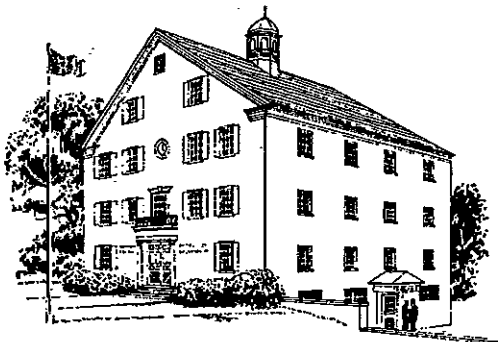
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Borough Planner**

For:

**Bernardsville Borough
Planning Board**

**Adopted:
September 28, 2000**

**Amended:
October 28, 2004**



BOROUGH OF BERNARDSVILLE

INCORPORATED JUNE 2, 1924

SOMERSET COUNTY

ROUTE U.S. 202, P.O. BOX 158

BERNARDSVILLE, NEW JERSEY 07924

EXECUTIVE OFFICE (201) 766-3000

Residents:

This 2000 Master Plan for the Borough of Bernardsville presents the findings and recommendations of your Planning Board concerning the future of our community. This plan is a continuation of the planning process in Bernardsville and represents an update of the Master Plan Reexamination which was adopted in 1996. One recommendation presented in that reexamination was to prepare a new comprehensive master plan. The last complete Master Plan was undertaken in 1978, or 22 years ago.

This 2000 Master Plan strikes a balance between the need to protect our environment, respect our history, preserve the suburban/estate character of the Borough, enhance the downtown and provide for reasonable uses. It is our guide into the 21st century.

We appreciate the cooperative efforts of public agencies, private groups and individual citizens who assisted in preparation of this Comprehensive Master Plan.

Donald Knudsen, Chairman
Bernardsville Borough Planning Board

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Somerset County, NJ**

Comprehensive Master Plan - 2000

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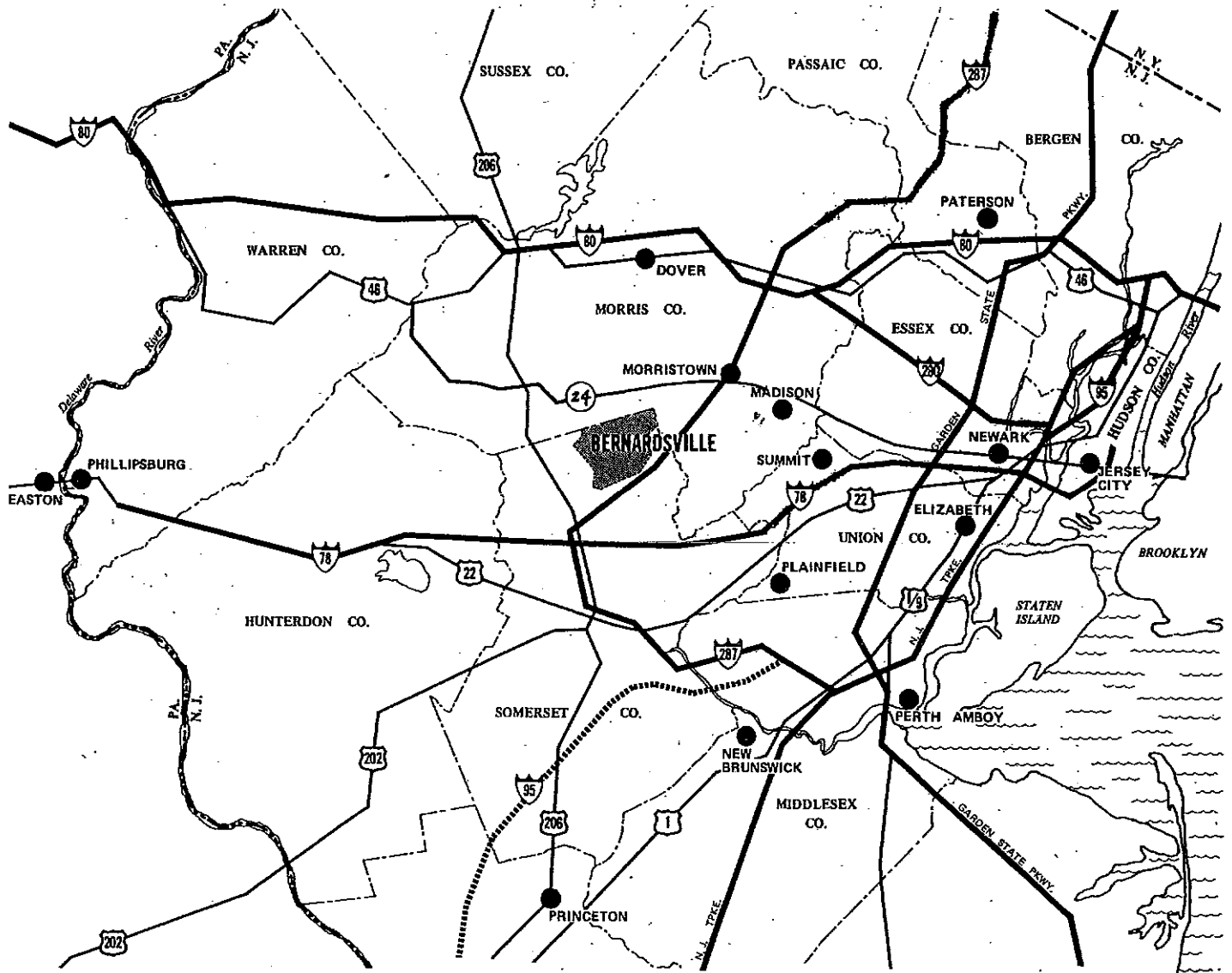
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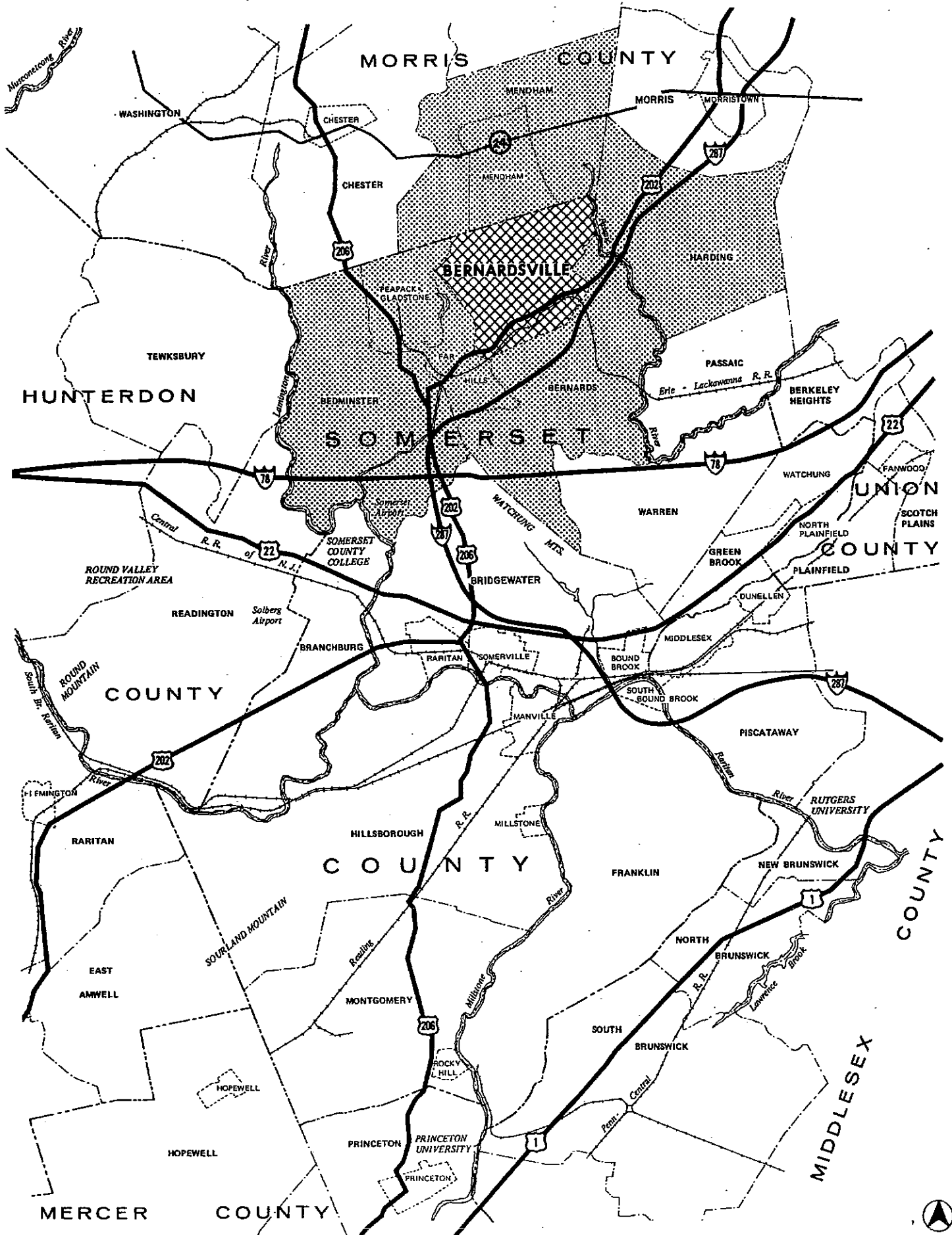
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REGIONAL LOCATION MAP



BERNARDSVILLE'S SUBREGION



BERNARDSVILLE COMPREHENSIVE MASTER PLAN

Purpose Of The Master Plan

The Master Plan is a document that explicitly states the policies for land development and redevelopment in Bernardsville Borough. As such, it is intended to guide the public and private sectors in making decisions on projects involving land use and improvements. Through its goals and objectives statement, the comprehensive master plan sets out a vision for the community in the coming years.

A Master Plan forms the legal foundation for the zoning ordinance and zoning map. New Jersey, among a handful of other states, explicitly ties the planning of a community as embodied in the Master Plan and Land use Plan Element to the zoning ordinance and zoning map, which is the primary law governing the use of land. Consequently, the zoning ordinance must be substantially consistent with the municipality's land use and housing policies in its Master Plan. In the same fashion, the zoning map must be substantially consistent with the land use plan element that is a part of the Master Plan.

The process of adopting a Master Plan provides a periodic opportunity to develop a shared consensus that balances many factors, including the needs of government, residents, property owners, the environment, economic influences, the business community and real estate development. Every six years the Master Plan is reviewed to determine if the goals and objectives for land development and redevelopment remain valid. The reexamination of the previous Master Plan in 1996 by the Planning Board led to the conclusion that a new Master Plan - this document - should be prepared and adopted.

Planning Goals And Policies

The goals and policies for the future of Bernardsville and for this Master Plan are best described by the following statement from the 1978 Comprehensive Master Plan (page 3):

Bernardsville has developed a series of general policies over the past few decades that have guided its past development and remain valid for the future. This Master Plan's constituent policies, proposals and plans are based on the following general premises:

- To preserve the residential and open character of the community.

- To allow non-residential forms of land use, especially commercial, to the extent that they serve residents of the Greater Somerset Hills Sub-region.
- To protect Borough residents and their property from negative environmental, financial and other impacts of development.
- To provide community facilities, services and utilities to the extent they are practically feasible.
- To promote the conservation of natural systems, environmental resources, rural appearance and the natural amenities that characterize Bernardsville.

In addition to reaffirming these longstanding goals and policies of the Borough, recent activities and improvements in the Town Center or downtown have introduced new goals and policies particular to this area.

- To promote the downtown as the commercial and civic center of the Borough,
- To enhance the physical characteristics of the downtown through sign, facade, architecture and streetscape improvements,
- To improve the circulation patterns into and through the downtown,
- To create a pedestrian-friendly atmosphere in the downtown, and
- To provide sufficient parking in the downtown by rationalizing land use with parking needs.

Lastly, more detailed goals, policies, objectives and recommendations are contained in each of the chapters or elements of this Comprehensive Master Plan document.

Bernardsville Planning History

Bernardsville last adopted a Comprehensive Master Plan in 1978. It adopted reexamination

reports in 1982, 1988 and 1996. Additionally, the Borough prepared Housing Plan Elements And Fair Share Plans in 1988 and 1995. Based on each of these housing plans, the Borough received substantive certification from the New Jersey Council On Affordable Housing ("COAH").

Immediately following the 1978 Comprehensive Master Plan, the Borough prepared and adopted the Development Regulations Ordinance (1979) which continues today to serve as the zoning, subdivision and site plan ordinance for Bernardsville. Since 1979 numerous amendments have been adopted which both implement recommendations of reexamination reports and Fair Share Plans and respond to particular needs and issues.

Lastly, Bernardsville has petitioned and has been granted Town Center designation by the State Planning Commission (April 28, 1999). This action creates a partnership between the Borough and State agencies with the principal aim of enhancing the center or downtown area of the Borough. It also outlines general land use policies for the center's environs or areas outside the Town Center.

The Region

Bernardsville is one of 21 municipalities in Somerset County. It is located in the northeastern section of the County and borders Morris County to the north.

Somerset County had a 1990 population of 240,279 persons of which Bernardsville with a population of 6,597 represents 2.7 percent. Bernardsville contains 8,384 acres, or 13.1 square miles, representing 4.2 percent of the County's land area.

Somerset County has experienced significant population growth as suburbanization moves westward from the more built-up areas to the east. The County's population jumped from 143,913 in 1960 to 240,279 in 1990; an increase of almost 100,000 persons. A sizeable portion of this increase is due to in-migration of families seeking single-family housing in a rural/suburban setting. As witness to this trend, in 1960 the County had 29,761 owner-occupied dwelling units which increased to 66,561 such units in 1990 (+123.7 percent). Of that 66,561 number, 48,739 were single-family detached units (73.2 percent).

Traditionally, access to and through the County was via Route 22 (east-west) and Route 202/206 (north-south). While these two routes still are important corridors, the introduction of I-287 (north-south) and I-78 (east-west) have had a major impact upon the County. The two interstates intersect in the northern part of the County, in Bedminster, and Routes 22, 202/206, 28 and I-287 intersect in the middle of the County: proximate to Somerville. These highways and in particular the new interstates have made the County more accessible and have ushered in both population growth and retail commercial development.

Somerset County is one of the more affluent areas of the State. In 1989, the median family income was \$62,255. Of the 21 municipalities in the county, Bernardsville had the second-highest

median family income of \$81,778.

The major planning issues within the County are protection of critical environmental features, managing growth and mitigating traffic congestion.

Somerset Hills Region

Bernardsville is geographically part of the Somerset Hills group of communities, as defined by their hills and steep slopes. These municipalities include Far Hills (named for these hills), Peapack-Gladstone (part), Bedminster (part), Bernards Township (part) in Somerset County and the Mendhams (part) in Morris County.

A number of significant factors have contributed to the special character of the Somerset Hills. While they can be separately identified and listed, it is noted that these are interacting elements that took place extended over a considerable period of years.

In the historic westward expansion of the Greater New York/Newark Region, there were two major impediments, the Watchung Mountain Range and the Great Swamp. Thus, development occurred along two corridors around these impediments, creating a triangular effect. The Route 22 corridor between Newark and Somerville became the southern leg, Route 24 from Newark to Morristown became the northern leg, and Route 202 from Somerville to Morristown going through Bernardsville became the third leg. Development along Route 202 was less intense than along the other legs.

The Somerset Hills region is located between two historic centers: Somerville and Morristown. Somerville, located on the Raritan River, a county seat and a major commercial center and industrial area, was also well served by Route 22 to Newark, Route 28 to Elizabeth and Route 206 to Trenton. Morristown, the county seat of Morris County, connecting to the eastern centers via Route 24, Columbia Road/South Orange Avenue and Route 10, has dominated the north central area of the State.

The headwaters of the Passaic River and the Raritan River originate in the Somerset Hills region. In combination with the pattern of rolling hills and frequently steep slopes, the physical features of the area did not lend themselves to industrial or commercial development. Such potential development was, of course, further inhibited by distances to metropolitan centers.

Today, there are two new regional features that affect the accessibility of the Somerset Hills region: Route I-287 and Route I-78, parts of our national interstate system. Route I-78 traverses the center of the State from the Newark Airport to Phillipsburg. Route I-287 is a circumferential arterial road extending from Perth Amboy through the Somerville-Bridgewater area, around the Watchung Mountain Range and then northward through Morristown to a northern termination point in New Jersey at the Mahwah/Suffern state border. These interstate routes have made the Somerset Hills

region more accessible and as a result housing and population have grown.

The Borough of Bernardsville

The Borough of Bernardsville is not traversed by either of the two arterials, although I-287, located immediately south of the Borough is readily accessible. Historically, Bernardsville did not have the utilities, road network or environment that typically supports large-scale development of industrial and commercial uses. Rather, it is a community in which the form of land development has closely followed the natural terrain and the network of local roads that interconnect Bernardsville to its neighbors. Large-scale land use changes relating to the recent changes in accessibility to the metropolitan centers have not occurred and would be viewed locally as inconsistent with the historic pattern of development and the suburban/rural character of the community. Such changes would have major adverse environmental impacts.

Bernardsville remains a modest-sized municipality with a diversity of housing types and land uses. Within the Borough, most housing is single-family detached (81.4 percent) but there also are single-family attached (3.7 percent), multifamily units (14.0 percent) and low- and moderate-income housing. In 1990, the Census counted 2,561 total units.

This diversity of housing corresponds to the Borough's residential zoning. There are multifamily units in and around the downtown, small-lot homes also near the downtown, one-acre zoning ringing the downtown area and finally larger-lot zoning and estates in the Mine Mountain sector of Bernardsville.

The land use pattern is reflective of the zoning and historical development. First, Bernardsville has a defined downtown, consisting of stores, shops, offices and two major supermarkets. These commercial uses serve Bernardsville residents as well as residents of abutting communities.

The downtown and its surrounding concentration of housing is identified as a Town Center in the State Development and Redevelopment Plan (1992). The Town Center has a population of 2,618 persons (1990) and contains 918 acres or 1.43 square miles.

Serving these land uses and residents are public facilities, schools and parks. There is very little industrial land use in the Borough. The one exception is the quarry property to the immediate west of the Town Center.

The circulation patterns fall into three categories. First, the Bernardsville railroad station affords rail and bus commuting to eastern employment centers, primarily New York City. Second, the proximity to I-287 provides a convenient commuting route to regional employment areas. Local roads provide access to residential neighborhoods and interconnect to collector roads leading to Routes 202 and I-287.

The major planning concerns facing Bernardsville are:

- Traffic congestion during the peak commutation and other periods,
- Truck traffic through the downtown and on local roads,
- Limited sewer capacity due to serious infiltration during storm periods,
- Subdivision of heritage estates in the Mine Mountain sector,
- Overbuilding in residential zones,
- Insuring development is environmentally appropriate,
- Improving pedestrian access and safety,
- Providing for open space and recreation areas, and
- Enhancement of the downtown.

As is shown on Table 1: "Analysis of Development Potential In Bernardsville Center and Environs" only modest housing development is anticipated in most zones of the Borough. One exception is in the large-lot R-1 (5.0 acre) zone district, where the potential subdivision of estates and a portion of the Somerset Hills Country Club could generate $200 \pm$ new single-family houses. Similarly, in the R-1A zone, potential subdivision of a large farm and the remaining portion of the Somerset Hills Country Club properties could generate another $200 \pm$ new single-family houses.

These R-1 and R-1A areas are characterized by streams, steep slopes and substantial natural vegetation. The large lot requirement, 5.0 acres in the R-1 zone, and a relatively new steep slopes constraints ordinance, which prevents disturbance of steep slopes, are directed at promoting environmentally sound development.

**TABLE 1: ANALYSIS OF DEVELOPMENT POTENTIAL
IN BERNARDSVILLE TOWN CENTER AND ENVIRONS**

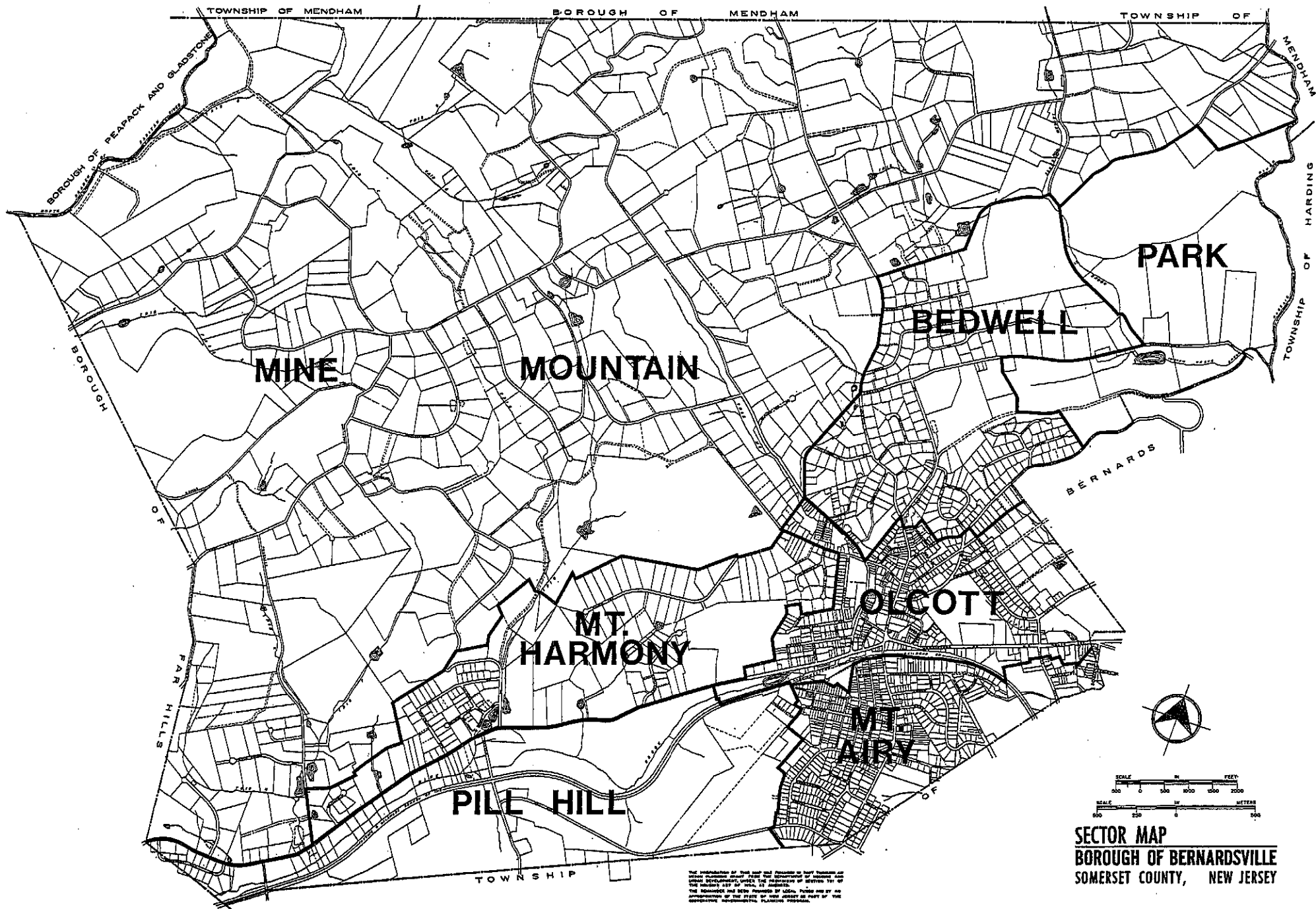
<u>Zones Within Town Center</u>	<u>Permitted Density</u>	<u>Development Status</u>	<u>1998 Housing Units</u>	<u>Final Buildout Housing Units</u>
1. R-8	7/ac	Small zone already developed for 56 townhouse units.	56	56
2. R-5	5,000 s.f./lot 0.11 acres/lot	Fully developed single family zone district Future development will consist of infill, redevelopment and attempts at multifamily conversions.	238	275
3. R-4	11,250 s.f./lot 0.26 acres/lot	Fully developed single family zone district. Future development will consist of infill, redevelopment and attempts at multifamily conversions.	514	550
4. R-3	20,000 s.f./lot 0.46 acres/lot	Fully developed single family zone district. Future development will consist of infill.	185	200
5. R-2	50,000 s.f./lot 1.15 acres/lot	Fully developed single family zone district. Future development will consist of infill.	56	65
6. B-1	Business	Apartments are permitted in this business zone over shops and stores. Future development will consist of redevelopment of older and underutilized buildings as the B-1 zone is substantially developed.	48	65
7. O-B	Office Building	Housing is not permitted in this office building zone and none is present. Zone is almost fully developed for office use.	--	--

<u>Zones Within Town Center</u>	<u>Permitted Density</u>	<u>Development Status</u>	<u>1998 Housing Units</u>	<u>Final Buildout Housing Units</u>
8. C-1	Commercial	Housing is permitted over shops in this commercial district but there are very few present in this zone.	10	10
9. I	Industrial	Housing is not permitted in the industrial zone. Zone has potential for light industrial, warehouse and storage uses.	--	--
10. I-2	Light Industrial	Housing is not permitted in this zone which is fully developed for light industrial uses.	--	--
11. HD	Highway	Housing is not permitted. District has developed for shopping center/supermarket use.	--	--
<u>Zones Outside Town Center</u> (Environs)				
R-2	50,000 s.f./lot 1.15 acres/lot	Fully developed single family zone district. Future development will consist of infill	312	350
R-1A	137,500 s.f./lot 3.17 acres/lot	Partially developed single family zone district. Somerset Hills Country Club and large farm offer substantial single family development potential.	86	275
R-1	218,750 s.f./lot 5.02 acres/lot	Developed with single family homes and estates. Subdivision of estates and vacant land into 5.0 acre lots is occurring and will continue. Potential subdivision of Somerset Hills and Roxiticus Country Club.	1,274	1,475
Total			2,779	3,322

Town Center¹

The Bernardsville Town Center has traditionally existed as the location for the area's commercial activity and diverse housing stock. The central business district and strip commercial along Route 202 serve a retail market that includes not only the Borough but also surrounding communities. Proximate to this area is mixed housing including small apartment complexes, 2-4 family structures, rental apartments over stores and shops, and single family homes on smaller sized lots. Also, within this Town Center are industrial, government and high school uses. The Center is served by public water and sewers. Access is principally provided by Route 202, a Federal highway, and County Route 525, a collector roadway.

¹ "Town Center" is defined in the State Development And Redevelopment Plan (1992) as "existing places that are traditional centers of commerce or government... They provide a core of commercial services to adjacent residents and provide employment in their regions. Towns contain several neighborhoods that together provide a highly diverse housing stock in terms of types and price levels." (p. 95)



SOCIO-ECONOMIC CHARACTERISTICS

Population

The population of Bernardsville steadily rose to reach a peak in 1980 with 6,715 persons. The largest increase in the population of Bernardsville was between 1950-1960 when the population rose 28.27 percent. This increase was due to family formation and population relocation to suburban communities following World War II. This growth continued into the 1960-1970 decade and in 1970 there were 6,652 residents in the Borough. Since then there have been only minor fluctuations. In 1990 the population was 6,597, only 55 persons different than the population in 1970.

The Somerset County Planning Board envisions only minor changes to Bernardsville's population. They project a 2010 population of 6,715 or 118 more persons than in 1990. While the numbers of housing units show modest increases in the Borough, these housing unit increases are offset by declines in family and household size.

This conclusion is verified by a review of household size in Bernardsville. Since 1970, the size of households has steadily declined: 1970 - 3.30, 1980 - 2.90, 1990 - 2.67 and is projected to be 2.47 in 2010.

**TABLE 2:
POPULATION HISTORY
BERNARDSVILLE BOROUGH, NJ
1930 - 1990 AND 1998**

<u>Year</u>	<u>Population</u>	<u>Numerical Change</u>	<u>Percent Change</u>
1930	3,336	--	--
1940	3,405	69	2.07
1950	3,956	551	16.18
1960	5,515	1,559	39.41
1970	6,652	1,137	20.62
1980	6,715	63	0.95
1990	6,597	-118	-1.76
1998*	6,931	334	5.06

* Estimate by the Somerset County Planning Board (1999)

Age of Population

Between 1980 and 1990 there were substantial and interesting changes in the age composition of Bernardsville's population. First, the total population did not change substantially in the 1980-

1990 decade: a loss of 118 persons or only 1.8 percent. In contrast, there was a dramatic drop in the school age population cohort: ages 5-18. This decline of 508 persons represents a decline of 31.1 percent, from 1,634 in 1980 to 1,126 in 1990. There has also been a very modest decline in the 55-64 age cohort of 63 persons or 7.5 percent.

The dramatic decline in persons in the 5-18 age cohort is predominantly due to the shrinking size of families caused by lowering birth rates. The impact of these figures is upon the local school system which experienced lower enrollments during the 1980-1990 years.

All other age cohorts have experienced population increases. Reflecting state and national trends, the largest increase was with the 65-and-over cohort which increased 15.5 percent. The second largest was a 15.0 percent increase with the 4-and-under cohort. Third largest increase was 11.7 percent in the 25-34 cohort.

A large part of these age-of-population facts is explained by tracing baby boom events since 1946. The first baby boom was between 1946-1964, immediately following World War II. These persons are now (2000) 39-54 years old. They in turn are having their own families and children.

As these age cohorts "age" they have their impact upon schools, for example, with current modest increases in enrollment projected to continue to the year 2007, and continued demand for single-family dwellings. As the World-War-II baby boomers further continue to age, there will soon be demands for senior housing.

**TABLE 3:
POPULATION CHANGE BY AGE
BERNARDSVILLE BOROUGH, NJ
1980-1990**

<u>Age Cohort</u>	<u>1980 Population</u>	<u>1990 Population</u>	<u>Numerical Change</u>	<u>Percent Change</u>
4 and Under	273	314	41	15.02
5-18	1,634	1,126	-508	-31.09
19-24	487	506	19	3.90
25-34	792	885	93	11.74
35-44	914	997	83	9.08
45-54	999	1,095	96	9.61
55-64	835	772	-63	-7.54
65 and Over	<u>781</u>	<u>902</u>	<u>121</u>	<u>15.49</u>
Total	6,715	6,597	-118	-1.76

Source: US Bureau of the Census: 1980 and 1990.

Regional Population Trends

Comparison of the 1980-1990 population of Bernardsville to other municipalities in Northern Somerset County shows a division into two categories of municipalities. Communities like Bernardsville, Bound Brook, Somerville and Watchung have had little growth or may have actually lost population. In contrast, communities like Branchburg, Far Hills, Green Brook, Bernards and Bridgewater have gained population.

In these communities, gains or losses in population are a function of development or lack thereof. The older built-up communities, with little or no vacant land available for new housing, are not growing. However, other communities with vacant land are still developing and growing.

Population throughout Somerset County is projected to continue to grow. In the 1990-2000 decade it is estimated County population grew 20,590 persons and is projected to increase another 36,000 by 2010. Some of that growth will be accommodated in Northern Somerset County communities with vacant developable land: Bridgewater and Bernards Townships for example.

There will be development pressures on Bernardsville but with scant vacant developable land the population changes will be quite modest. These pressures will be manifest in further subdivision of large estates, demand for multifamily housing and senior citizen housing.

**TABLE 4:
REGIONAL POPULATION TRENDS
IN BERNARDSVILLE BOROUGH,
NORTHERN SOMERSET COUNTY MUNICIPALITIES
AND SOMERSET COUNTY 1980 - 2000**

<u>Municipality/Area</u>	<u>Population 1980</u>	<u>Population 1990</u>	<u>Projected 1990-2000 2000</u>	<u>Projected Changes Population Numerical</u>	<u>Projected Population 2010</u>
Bedminster Township	2,469	7,086	7,689	603	11,372
Bernards Township	12,920	17,199	19,603	2,404	24,733
Bernardsville Borough	6,715	6,597	6,690	93	6,715
Bound Brook Borough	9,710	9,487	9,338	-149	8,853
Branchburg Township	7,846	10,888	13,560	2,672	14,812
Bridgewater Township	29,175	32,509	36,298	3,789	41,525
Far Hills Borough	677	657	974	317	1,042
Green Brook Township	4,640	4,460	4,987	527	5,066
North Plainfield Borough	19,108	18,820	18,109	-711	17,507
Peapack/Gladstone Borough	2,038	2,111	2,175	64	2,274
Somerville Borough	11,973	11,632	11,473	-159	11,192
Warren Township	9,805	10,830	12,326	1,496	13,598
Watchung Borough	5,290	5,110	5,305	195	5,126
 Somerset County	 203,129	 240,279	 260,869	 20,590	 296,199

Source: Somerset County Data Book, 1996 and U.S. Bureau of the Census

Assessed Valuation

Analysis of assessed valuation of all property in Bernardsville shows very little change in the 1990-1999 time period studied. The total number of parcels has increased to 2,863 in 1999 from 2,623 in 1990: a 9.1 percent increase. Most of this 240 parcel increase is in the residential category. The largest valued property class is residential. In the nine year period studied, it has been consistently between 82 percent to 84 percent of total valuation.

The combined change in the farm category is 133 parcels in 1999 from 48 in 1990. This change reflects a substantial increase in farmland assessment. It does not, however, reflect a reversion to farming in the community. Rather, it reflects new farmland assessments on previously vacant properties and on properties greater than 5 acres in size seeking the tax advantage offered by this assessment. There is a consequent drop in vacant parcels to 164 in 1999 from 220 in 1990. In actuality, there are very few working farms remaining in the Borough.

Commercial, industrial and apartment parcels remain substantially unchanged in the nine years studied.

**TABLE 5:
COMPARISON OF TAX PARCELS AND ASSESSED VALUE
1990 AND 1999 - BERNARDSVILLE BOROUGH**

<u>Tax Class</u>	<u>1990 Number Of Parcels</u>	<u>1990 Valuation</u>	<u>1990 Percent Valuation</u>	<u>1999 Number Of Parcels</u>	<u>1999 Valuation</u>	<u>1999 Percent Valuation</u>
1 Vacant	220	\$ 60,282,400	5.16	164	\$ 33,068,200	2.71
2 Residential	2,204	964,070,500	82.46	2,401	1,034,877,800	84.71
3a Farm (Reg.)	16	17,411,600	1.49	45	51,657,700	4.23
3b Farm (Qual.)	32	17,500	-0-	88	662,896	0.05
4a Commercial	144	111,233,000	9.51	149	91,307,400	7.47
4b Industrial	2	11,943,300	1.02	3	5,509,800	0.45
4c Apartment	<u>5</u>	<u>4,193,400</u>	<u>0.36</u>	<u>12</u>	<u>4,624,800</u>	<u>0.38</u>
Total	2,623	\$1,169,151,700	100.00	2,863	\$1,221,708,596	100.00

Source: New Jersey Department of Community Affairs,
Borough of Bernardsville Tax Assessors Office

Covered Employment

Since 1980, covered employment* in Bernardsville has experienced modest growth. The change between 1980-1994 is an increase of 399 jobs or an increase of 19.8 percent. In contrast, the change in the county has been larger with employment numbers growing 69.8 percent in the same time interval (1980-1994).

The major employment category in Bernardsville is retail sales, with few jobs in office or light manufacturing categories. Somerset County has a more diversified economic base which includes not only retail but office and light manufacturing employment. Given the built-up character of the Borough, especially the commercial and industrial zone districts, the above employment figures are not expected to change significantly in the near future.

* Covered employment includes all employment or jobs that are "covered" by state unemployment insurance. The New Jersey Department of Labor collects and publishes this information.

**TABLE 6:
COVERED EMPLOYMENT 1980, 1990-1994
BERNARDSVILLE BOROUGH AND SOMERSET COUNTY**

<u>Year</u>	<u>Covered Jobs Bernardsville Borough</u>	<u>Annual Numerical Change</u>	<u>Covered Jobs Somerset County</u>	<u>Annual Numerical Change</u>
1980	2,020	--	79,234	--
1990	2,429	--	118,980	--
1991	2,509	80	119,461	481
1992	2,370	-139	123,918	4,457
1993	2,346	-24	129,066	5,148
1994	2,419	73	134,535	5,469

Source: New Jersey Covered Employment Trends 1980-1994
and Somerset County Data 1996.

Equalized Property Tax Rates

A comparison of the thirteen municipalities in Northern Somerset County, shows the equalized tax rate of Bernardsville to be approximately in the middle in 1993. However, by 1999 only two municipalities had lower tax rates, the other ten having equalized tax rates exceeding that of Bernardsville. The 1993 - 1999 change in equalized tax rate for Bernardsville was quite modest, only a 5.8 percent increase in the six-year interval.

The tax rate is not expected to change significantly in the near future. Bernardsville has little vacant land developable for either residential or other tax-rateable uses. Those properties that are developed for residential use are large lots with prestigious homes that pay taxes equal to their cost in services.

**TABLE 7:
EQUALIZED PROPERTY TAX RATES
NORTHERN SOMERSET COUNTY MUNICIPALITIES
BY RANK ORDER FOR 1993 AND 1999**

Municipality	Equalized Property Tax Rates	
	<u>1993</u>	<u>1999</u>
Bridgewater Township	1.20	1.819
Bedminster Township	1.22	1.375
North Plainfield Borough	1.47	3.329
Warren Township	1.50	1.765
Bernards Township	1.56	1.926
Bernardsville Borough	1.62	1.714
Watchung Borough	1.62	1.854
Branchburg Township	1.67	2.069
Far Hills Borough	1.72	2.442
Peapack/Gladstone Borough	2.29	1.667
Bound Brook Borough	2.50	3.238
Green Brook Township	2.71	2.029
Somerville Borough	2.71	3.374

Source: Abstract of Rateables, Somerset County Board of Taxation.

LAND USE CHARACTERISTICS

Bernardsville is a residential community characterized by low-density development with a developed Town Center containing stores, shops and offices. The Town Center is ringed by single family homes on smaller sized lots and a scattering of multi-family housing. Most of the Borough is devoted to residential use, parks, conservation and agriculture.

The Borough also contains industrial, commercial, and public/semi-public land uses. These uses are generally located in the Olcott Square area, the center of Bernardsville. They serve both the Borough and communities in the region. Residential and open-space uses surround this center area.

A summary of the existing land use follows. It reflects land use data and numbers shown on Tables 8 and 9. Also, contained in this element is a discussion of the limitations to development in Bernardsville by existing development and environmental constraints.

Residential-Single Family

The Borough tax records show the number of residential tax parcels (detached and attached single family housing) increased by 1999 to 2402 parcels from 1992 parcels in 1980, a 410 parcel or 20.6 percent increase. In this 19 year interval, there were 22 new parcels created, on average, each year.

Similarly, a comparison of residential land use area shows an increase from 1977 to 1997 of 741 acres. Analysis of this increase shows most development occurred in the R-1 (5.0 acre lots) and R-1A (3.2 acre lots) zone districts.

Today, single family residential land use area represents 51.6 percent or slightly more than half of Borough land, compared to 42.8 percent in 1977. The land absorbed for this new housing was categorized as undeveloped in 1977. Most of this undeveloped category of land use was in fact larger sized estates that had development potential. As implied in 1977, this potential for development has been realized.

There is, for all practical purposes, no vacant or undeveloped land existing in the denser residential zone districts: R-3 to R-5. Thus, in the last 20 years development in these zone districts merely consisted of sporadic infill and minor instances of conversion.

The rate of increase for single family units in 1980-1990 varied between 21 parcels or units per year (increase in tax parcels) and 36 units per year (increase in census of housing data). The latter figure includes not only single-family but also multifamily housing. Those numbers offer a range of growth that will probably continue for the next six years. Further, this residential growth will be in the low density districts containing larger sized properties.

Residential 2-4 Family

Only 24 acres were used for 2-4 family housing in Bernardsville in 1997. This is a small number and has changed very little since 1977. The minor change from 1977, only 3 acres, is due to isolated conversions and infill of housing in this district.

Residential - Multifamily

Although, this category is relatively small, amounting to 19 acres in 1997 it did witness a substantial change over the 1977 figure of 13 acres. Part of this increase is the Pine Street multifamily housing project of 26 units. Townhouse multifamily housing represents the remainder of the increase.

Future growth in this category will be small, if any.

Commercial

The number of commercial tax parcels increased to 149 in 1999 over 110 in 1977 for a 35.5 percent increase. However, the change in land area from 1977 to 1997 was very small; only 2.0 acres over the 1977 base of 22 acres. No significant changes in this category are expected in the next six years.

Industrial

The industrial land area has remained unchanged in the interval and will continue unchanged in the next six years. Recent subdivision of the quarry property has increased the number of industrial parcels, but does not change the total land area classified industrial.

Public/Semi Public

This category includes municipal land (except parks), Board of Education property, private schools, houses of worship and railroad property.

This land use category has changed very modestly to 1997 from 1977; only 10 acres or 4.5 percent. Little change is anticipated in the next six years.

Parks and Conservation

Two sub-categories fall under this heading: public and private/conservation. Modest expansion has taken place in the intervening years; in particular with the Audubon Society property in the northeast sector of the Borough. The Borough has witnessed a growth of 158 acres or 17.5 percent in the land use category in the last 20 years.

Growth in parks, open space and conservation may occur if the Borough uses local Open Space Tax and State Green Acres funds for acquisition of parks and open space.

Farm and Vacant

A very substantial increase was witnessed in this category in both number of farm parcels and acreage. The number of farm tax parcels went to 133 in 1999 from 25 in 1977. Similarly, the land use acreage rose to 1,120 in 1997 from 280 in 1977. The overwhelming number of these new "farms" are properties in the Mine Mountain sector of Bernardsville newly assessed as farms for tax reasons.

As a result of land use development and changes in assessment of vacant land to farm, the number of undeveloped parcels (or vacant) has declined to 164 in 1999 from 265 in 1980. The land area change is more dramatic going to only 764 acres in 1997 from a high of 2,536 acres in 1977.

Some of the land classified as vacant land today is part of subdivisions that are in the process of being developed. It is anticipated that in the next six years, subdivided vacant land will be built upon for new single family housing. The remaining vacant land is large estates that have hypothetical subdivision potential.

Considered together, the amount of land classified as agriculture or vacant has changed from 2,816 acres in 1977 to 1884 acres in 1997, a decline of 932 acres, or 33 percent. Continued decline at about the same rate is expected.

Roads And Rights-of-Way

The eight acres of new roads created between 1977 - 1997 in Bernardsville are new local subdivision streets.

**TABLE 8:
TAX PARCELS, 1980, 1990 AND 1999
BOROUGH OF BERNARDSVILLE, NJ**

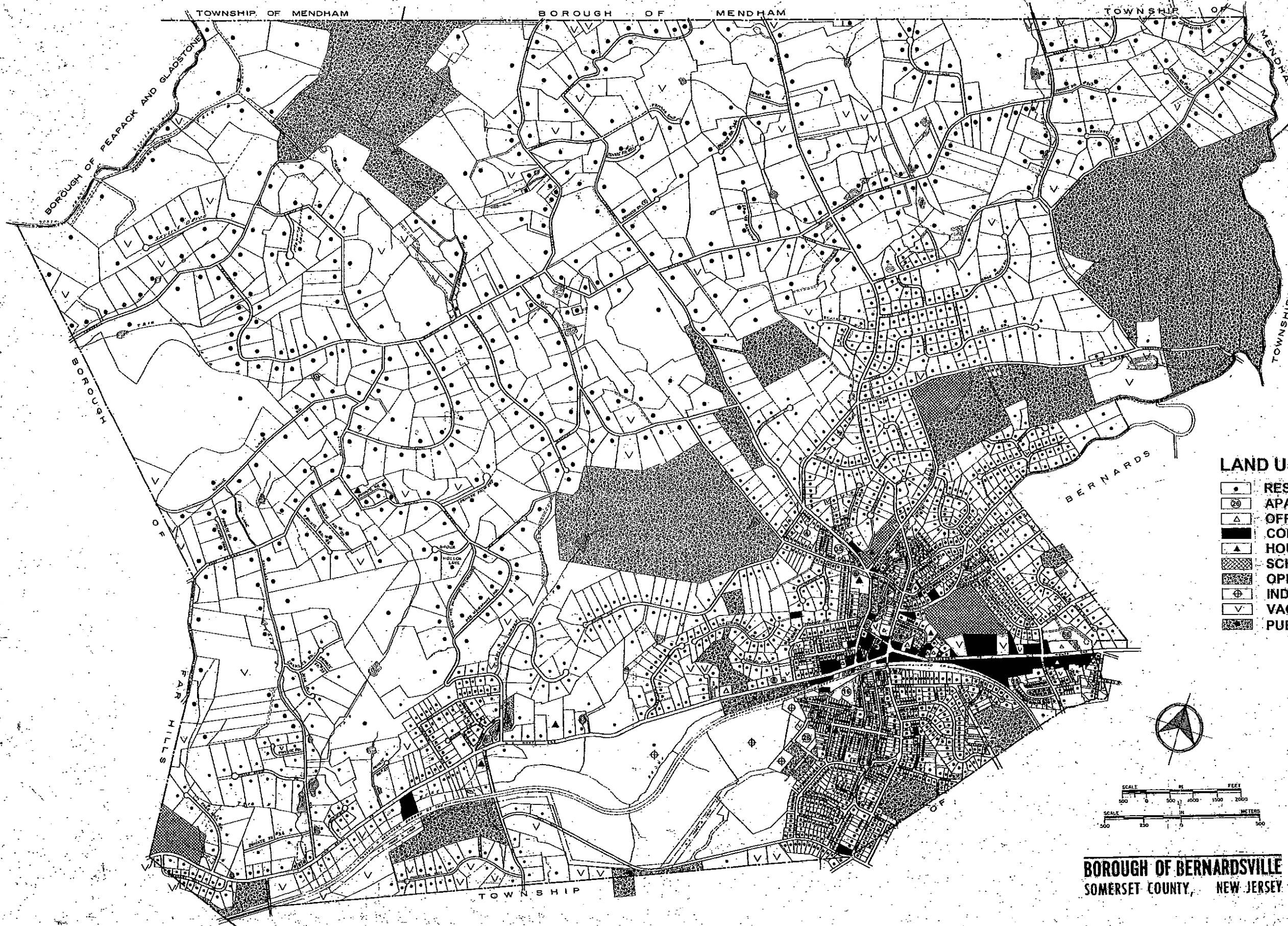
	<u>1980</u>	<u>1990</u>	<u>1999</u>	<u>1990 - 1999 Change Parcels</u>	<u>Percent</u>
1. Vacant	265	220	164	- 56	- 25.4
2. Residential	1,992	2,204	2,402	+ 198	+ 9.0
3. Farm	25	48	133	+ 85	+177.1
4A. Commercial	110	144	149	+ 5	+ 3.5
4B. Industrial	2	2	3	+ 1	+ 50.0
4C. Apartment	<u>4</u>	<u>5</u>	<u>12</u>	<u>+ 7</u>	<u>+140.0</u>
TOTAL	2,398	2,623	2,863	+ 240	+ 9.1

Source: Borough of Bernardsville Tax Assessor

**TABLE 9: LAND USE COMPARISON
1977 - 1997 BOROUGH OF BERNARDSVILLE, NJ**

	<u>1977</u>		<u>1997</u>		<u>1977-1997 Change</u>	
	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>	<u>Acres</u>	<u>Percent</u>
Residential						
Single Family	3,585	42.8	4,326	51.6	+741	+20.7
2-4 Family	22	0.3	24	0.3	+2	+9.1
Multi-Family	13	0.2	19	0.2	+6	+46.2
Commercial	67	0.8	64	0.8	+2	+3.2
Industrial	66	0.8	66	0.8	0	0
Public/Semipublic	212	2.5	232	2.8	+10	+4.5
Parks & Conservation						
Public	415	5.0	484	5.8	+69	+16.6
Private/ Conservation	488	5.8	577	6.9	+89	+18.2
Agriculture	280	3.3	1,120	13.4	+840	+300.0
Undeveloped	2,536	30.3	764	9.1	-1,770	-69.8
Subtotal	7,684	91.7	7,676	91.6	-8	-0.1
Roads and Rights- of Ways	<u>700</u>	<u>8.3</u>	<u>708</u>	<u>8.4</u>	+8	+1.1
TOTAL	8,384	100.0	8,384	100.0		

Source: 1977 Master Plan
1997 Consultant land use field survey



LAND USE

- RESIDENTIAL
- APARTMENTS / TOWNHOUSES
- OFFICE
- COMMERCIAL
- HOUSE OF WORSHIP
- SCHOOL
- OPEN SPACE / PARK
- INDUSTRIAL
- VACANT
- PUBLIC FACILITY



BOROUGH OF BERNARDSVILLE
SOMERSET COUNTY, NEW JERSEY

LAND USE SURVEY - 1997
UPDATE - 2000

PREPARED BY:
P. DAVID ZIMMERMAN, AICP / PP
BOROUGH PLANNER

HISTORIC PLAN ELEMENT

Bernardsville Borough is fortunate in that it still retains visible and tangible resources from the past. These resources are a continual reminder that the present physical appearance and character of the Borough has evolved over a time period of several hundred years. In the following pages a short synopsis of what is known about the history of Bernardsville Borough is presented consistent with the Municipal Land Use Law requirements for a historic preservation plan element.

Early Settlers

When the first Europeans arrived in the area they found members of the Lenni Lenape tribe. Probably 200 Indians from this tribe lived in the area at that time. One of the earliest records shows that in 1717 Lenni Lenape tribe sold for \$50 a total of 300 acres along the Passaic River (part in Bernardsville) to an agent of the Governor-Proprietor of East Jersey. While this land remained the property of the governing body, numerous squatters settled on it from time to time.

Alexander Kirkpatrick was the first permanent settler in Bernardsville about whom much is known. He arrived from Bound Brook in 1736, and settled at Mine Brook. Other settlers, largely Scottish, Irish, German and English, came and chose home sites along the streams whose water they used for power to operate mills. Cider mills and distilleries were in abundance because the early land grants required the planting of apple trees.

The Revolutionary Period

Until 1924, Bernardsville was a part of Bernards Township, hence its early history is also the history of that township. The settlement of Bernardsville was originally known as Vealtown, but the origin of the name is unclear. However, most historians state either that the name derives either from a family known as Veal or Vial living in the area, or that the area was possibly a center for calf slaughter.

Bernards Township at the time of the Revolution was comprised of small villages surrounded by farms.

In 1777, General Washington established his headquarters in Morristown, about ten miles to the north, with his troops quartered in Jockey Hollow. The people of Bernards became familiar with the sounds of the fife and drum as detachments of the Colonial army passed by daily on their way to and from their posts. To be within easy reach of the various outposts, the Continental officers were frequently quartered in the Lord Stirling residence.

With the main Colonial army quartered in Jockey Hollow the soldiers frequently visited the Vealtown tavern, which is now the Bernardsville Library. One story has it that the soldiers made so many excursions to the tavern that a road was developed through the woods over the hill from Jockey

Hollow to the village, hence the name Old Army Road. The original route began on the McAlpine property about two miles in from Route 202, on Tempe Wick Road. It proceeded across Hardscrabble Road through the woods and over the hill thence to the tavern.

Among the many heroes of the Revolution, the best known in the Bernards area was Major General William Alexander, also known as Lord Stirling. He built a lavish mansion in Basking Ridge on property left to him by his father, who purchased the first legally-held land in Bernards in 1719. At the beginning of the war Lord Stirling was commissioned as a Colonel in command of the 1st Battalion of the Somerset militia, the first body of troops raised in New Jersey. He supplied his troops with arms and ammunition at his own expense and throughout the war resupplied his troops from his own fortune.

He distinguished himself as an officer and tactician, which brought him to the rank of Major General. Early in the hostilities between the colonies and Britain he captured a British man-of-war laden with provisions. He took a prominent part in the battle of Long Island and in the battle of Brandywine Creek at Germantown, Pennsylvania. But his most distinguished action was at the battle on Monmouth where he commanded troops protecting Washington's flank and aided greatly in the success of that decisive battle.

In the early 1800's Vealtown continued as a peaceful farming hamlet. It was during these years that, as new homes continued to be built, an area generally referred to by its residents as "The Village" (Bernardsville) became distinct from "The Ridge" (Basking Ridge).

The Mountain Colony

In the early nineteenth century, Bernardsville had no magnificent estates, just a few rustic cottages and farm houses, surrounded by wooded hills made beautiful by wildflowers, dogwoods and orchards. Then quietly in the 1860's the change began from a small farming village to a prosperous residential community.

The first to come to the hills was Bishop Janes, who had a summer home where the Somerset Inn was later built. His son married a Bernardsville girl and kept the first boarding house for city people. Among the guests who came to the house was A. F. Stout, president of the Shoe and Leather Bank of New York.

In the mid 1860's, Stout settled on the outskirts of town on Mendham Road. A few years later he invited a close friend, George Seney, president of the Metropolitan Bank of New York, to his country home. Seney with the aid of the West Line Railroad (later the Erie-Lackawanna Railroad), was primarily responsible for the movement which in two decades transformed the surrounding farmlands into beautiful estates.

On his own property of 850 acres, Seney built the Somerset Inn. The huge four-story building

could accommodate as many as 500 guests. Before a fire destroyed the Inn in 1908, many of its visitors were captivated by the rolling hills and agreeable summer climate, and decided to build summer homes in Bernardsville and the surrounding countryside.

In the 1890's life in the mountain colony reached a peak, with polo matches, private race tracks, gardens, balls, and commuters racing coaches to and from the station. By that time, many leaders in industry and finance had established year-round residence in Bernardsville.

As large numbers of skilled workers were brought in to build and serve the great estates, Bernardsville grew in population and commerce. As life in the town centered around the big houses and the Somerset Inn, the greater part of the trade in the town lay in supplying the needs of the big houses, their grounds, livestock, and the inn.

By 1915, the estates were looking as if they had always been there. Bernardsville was a prosperous, flourishing town.

In the early 1920's the mountain colony began to wither. The first generation, the founders, died. Weakened by the income tax (1913) and World War I, their fortunes were divided, split into trust funds, with the principal protected and the income divided among the heirs. In most cases, this income was not sufficient to maintain the old standards.

In this already weakened state, the colony was not able to withstand the depression of the late 1920's. A few fortunes escaped serious damage, and those that did were so greatly reduced that it was necessary to sharply curtail expenditures. Big houses were closed; the owners moved into cottages.

Eventually the country recovered and the town filled with people who commuted by train and car to employment centers to the east. The baronial life style of the mountain colony was gone, but many of its estates and manor homes survive to preserve this unique character of Bernardsville.

As one passes through the town today reminders of those illustrious names may be seen on street signs and in the village square. Olcott Square is named for Frederick Olcott, a president of Central Trust Company, who held 238 acres in the area. George Post, the architect who designed the New York Stock Exchange building, the Wisconsin State Capitol Building, and the New York Produce Exchange, has several roads named for him.

Roebing Road is named for John A. Roebing, whose grandfather designed and built the Brooklyn Bridge. Some of the other familiar names from the era include Forrest Dryden, the founder and first president of the Prudential Insurance Company; Francis G. Lloyd who developed Brooks Brothers into a major store; J. Herbert Ballantine, the brewer; Percy R. Pyne and Robert P. Bliss, bankers; Robert L. Stevens, an inventor and founder of Stevens Institute; Charles Pfizer, a drug manufacturer; Richard Lindabury, a lawyer; J. William Clark, founder of the thread company; and Colonel Anthony R. Kuser, whose wealth came from coal and who donated the Polo Grounds to the

Borough.

Although a number of mountain colony estates have been subdivided, many are still present, on the mountain and in the hills around Bernardsville. Some of the big homes were converted into schools or country clubs.

Historic Structures, Houses And Districts

The physical legacy of the above described history is in part preserved today first by historic houses and structures most of which were built in the 1700's. Three of these historic structures are listed in the State and National Register of Historic Sites: John Parker Tavern (old library), Bernardsville Station, and Reynolds-Scherman House (private residence). There is one historic district also on the State and National Register: Morristown National Historic Park.

Manor homes and estates built on or around the 1890's in the Mine Mountain section of the Borough are an important part of Bernardsville's heritage and character. Additional historic structures and houses exist in the Borough but are not on the State or National Register.

The following is a list of historic sites and structures. The numbers correspond to their map location.

1. *Bernardsville Station*, Route 202, Bernardsville Borough. This one-story, hipped-roof structure includes notable interior Corinthian pilasters carved in oak. It was designed by Bradford Gilbert, in the Richardsonian Romanesque style, constructed in 1901-1902, and paid for by Grant B. Schley, founder of Far Hills Borough. It is now owned by NJ Transit. *It is listed in both the State and National Register of Historic Places.*
2. *The Kirkpatrick House*, 1765, Route 202, west of Bernardsville. The fine stone building was built by David and Mary Kirkpatrick, whose initials are chiseled in stone over the door, "D.M.K. 1765". The excellence of its craftsmanship can be seen in its hand-hewn beams, bakeoven and stone fireplaces. Although an addition has been made, the original structure stands unchanged.

Across the road and further west is a smaller stone house, built in 1742, in which the Kirkpatricks lived while building their home.
3. *John Parker Tavern* (aka Vealtown Tavern), about 1730, 2 Morristown Road. The interior structure and materials suggest that it was constructed prior to 1730. This structure is a fine example of a crossroads tavern constructed in the mid-18th century. During the Revolution, it was owned and operated by Captain John Parker of the 1st Battalion of Somerset County.

The Tavern was frequently used by Continental Troops, including General Anthony Wayne. A Tory spy, Aaron Wilde, was captured there. The building enlarged in 1970, was in use as the Bernardsville Library from 1903 through February, 2000, but has been sold for office use. The purchaser has received planning board approval for changes. The exterior of the historic portion will remain unchanged. *It is listed in both the State and National Register of Historic Places.*

4. *New Jersey Brigade Encampment, 1779 to 1780, Hardscrabble Road.* From 1779 to 1780, the New Jersey Brigade of the revolutionary forces under General Washington were camped in Log Town, the valley one and a half miles southwest of Jockey Hollow. The small but active community was equipped with a forge, grist mill, blacksmith shop and a small store. In April of 1780, the New Jersey Brigade joined the main body of soldiers at Jockey Hollow, leaving behind the traces of their short settlement which were rediscovered in 1968.
5. *Original Bernardsville Railroad Station, Route 202 east of Olcott Square.* Railroad depot used by the Erie-Lackawanna Railroad, built in 1822. Presently, a local newspaper office.
6. *Bunn's Mill, 1843, Mine Brook Road.* This building is now the Borough Hall and police station. John Bunn Sr. had his four story mill built in 1843 in the typical pattern of the day. It quickly became the center of considerable industry, as logging and grinding processes were undertaken in the principal structure, while a cider mill and distillery operated adjacent to it. All mill activity had ceased by 1913.
7. *The Jonathan Whitaker House, 1763, Mine Brook Road.* The first house built by Jonathan Whitaker was at the foot of what is now known as Page's Hill on the Bernardsville-Far Hills Road. A log cabin erected in 1745 was replaced by a frame house prior to 1763. The original property was obtained from the Penns of Philadelphia. The frame house was enlarged many years ago on its southern end.
8. *Dr. James Boylan House, 1777, Olcott Square.* Dr. James Boylan was a Vealtown physician who owned 135 acres of land locally. By 1777, he also owned a house and mill on Olcott Square. The mill has since been torn down, but the house is presently used for law offices.
9. *Old Army Road, improved road connecting Hardscrabble Road and Seney Drive bordering Sherman Wildlife Sanctuary.* Used by Washington's troops during the Revolutionary War.

10. *The Anderson House*, 1786, Anderson Hill Road. John Anderson built this white clapboard home on land given him by his father. It is a gracious house exhibiting quality workmanship in its masonry and large beam framing. The practicality of the era is epitomized by the large tree trunk which continues to support a beam in the basement. The house was enlarged in 1856, but the structure retains much of its original character.
11. *Olcott Building*, Olcott Avenue. Large stone building donated by Frederick Olcott to the Borough. Built in 1908. Presently used for offices by the Board of Education.
12. *Mullen House*, Childs and Mullen Lane. Constructed in 1763 it is presently a private residence.
13. *Reynolds-Scherman House*, 71 Hardscrabble Road. This picturesque stone house was originally constructed as a barn in the 18th century or early 19th century. It represents the area's regional vernacular architecture with its rubble stone walls, segmentally arched doorways, brick fireplace and simple interior woodwork. A 1928 remodeling shows the influence of the Colonial Revival style. Remnants of an old textile mill still exist on the site. The House was the summer home of Harry Scherman, principal founder of the Book of the Month Club (1924). It is now a private residence. *It is listed in both the State and National Register of Historic Places.*
14. *The Rennels House*, Hardscrabble Road. In 1723, an Englishman named Cantfield built a group of stone structures near the pond on Hardscrabble Road, starting the Log Town settlement. Samuel Rennels purchased the property sometime later turning the barn into his home and built a new barn on the corner nearby.

Rennels' son built another stone house on the same land, and operated a store and weaving shop. The property is now a part of the Scherman Wildlife Sanctuary.
15. *Morristown National Historic Park*, Hardscrabble Road. In the winter of 1779-80, the New Jersey Brigade of 1,300 men camped a few miles South of General Washington's main army camped at Jockey Hollow. This area was selected by Washington because of its strategic location and friendly New Jersey populace.

It is listed in both the State and National Register of Historic Places.

Historic Structures And Houses Recommendations

The sites discussed herein are of particular historic and/or architectural interest to Bernardsville Borough. It is recommended that the Borough encourage the continued use of historic properties in keeping with their original purpose or in the alternative a suitable and appropriate adaptive reuse. The Borough should explore means to implement this recommendation. The Borough should also encourage ways by which these historic structures and houses are not diminished by activities in the immediate environment within which they are located.

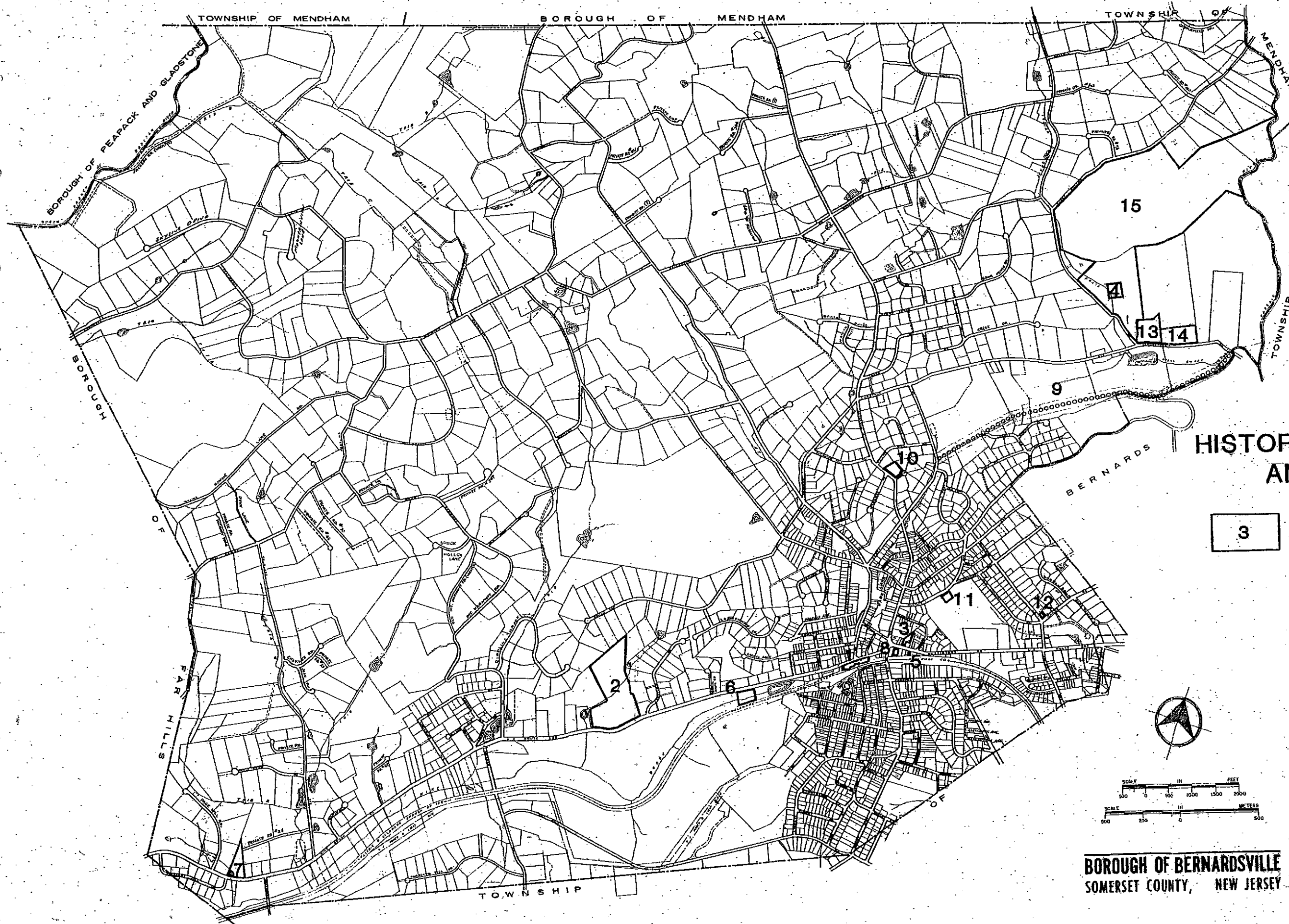
Heritage Estates And Mansions

The second category of the Borough's physical history is the heritage estates and mansions. These estates and mansions were created between 1870 and 1920 when Bernardsville became the fashionable haven for New York area industrial/banking magnates. Their planning significance was identified in the 1977 Master Plan which presented an inventory of these properties. At that time, the Plan identified 16 heritage estates and mansions. Since 1977, many of these homes and properties have changed. Some homes have been demolished and some properties subdivided. A few recently have been renovated and upgraded. Recently, several new mansions and estates are being established.

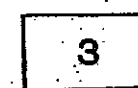
These estate mansions have current planning and zoning significance, in addition to their significance to the heritage and ambiance of the Mine Mountain sector. Estate mansions located on tracts of 20 acres or greater are allowed to be used for certain conditional uses. These uses include: a conference or management training center, a religious retreat, a private school or college, an art, antique or historic museum; or an arboretum or horticulture gardens, public uses and any combination of these permitted uses.

To date, no estate mansions have been converted to conditional uses except one to a private school, and that property has been reconverted to a residence. Upon review, several of these conditional uses, if developed as permitted, may have detrimental impacts upon their neighborhood. A conference center, for example, may generate traffic beyond the capacity of neighborhood and local roads. Other conditional uses are so undefined in scale as to potentially also be detrimental. It is therefor recommended that these conditional uses be eliminated.

However, the goal of preserving heritage estates and mansions remains a high priority for the Borough. Thus, to achieve or implement this goal, there may be certain types of very low density housing or even very low density uses, i.e., schools, retreats, recreation, etc. that may be appropriate to this sector of Bernardsville and individual heritage estates and mansions. It is difficult to legislate for these unique uses and insure reasonable density intensity of use standards. Implementation is best achieved on a property-by-property and use-by-use basis. However, evaluation of implementation strategies should be guided by the density objectives in this sector/district and commensurate levels of population activity and trip generation.



HISTORIC SITES, PLACES AND DISTRICTS



HISTORIC SITE, PLACE
OR DISTRICT

DATE: 1998

PREPARED BY:

P. DAVID ZIMMERMAN, AICP/PP
BOROUGH PLANNER

BOROUGH OF BERNARDSVILLE
SOMERSET COUNTY, NEW JERSEY

UTILITY SERVICE PLAN ELEMENT

The Municipal Land Use Law identifies a utility service plan element as follows:

A utility service plan element analyzing the need for and showing the future general location of water supply and distribution facilities, drainage and flood control facilities, sewerage and waste treatment, solid waste disposal and provision for other related utilities, and including any storm water management plan

In considering each of the above facilities, reference is first made to the 1979 Comprehensive Master Plan and subsequent relevant documents for background information.

Sewerage - The 1979 Master Plan stated the following:

Summary of Background Analysis

Bernardsville's provision of public utilities is in a constant state of expansion and improvement as the population grows. Generally, only the denser sectors (Bedwell, Olcott, and Mt. Airy) are served by municipal utilities; this situation is based on economic considerations (high densities allow economical service provision) and environmental factors.

The principal findings of the Background Report are as follows:

- (1) The municipal sanitary sewerage system is adequate at present, operating at slightly over 80% of capacity. As a result of recommendations of the Upper Raritan Regional 208 Wastewater Management Study, modification to the existing system may be required. (This Study is a federally-funded effort intended to improve quality of the surface waters of the area by changing, where needed, the methods of treating and disposing wastewaters.)*

Given existing growth projections, a need for some expansion is likely. The Borough has also defined several priority study areas for extending sewerage where a need and capability for service are present.

The population for the Borough, as seen in the late 1970's and reported in the 1979 Plan was on the upswing. These figures as contained in the 1979 Plan are shown below as:

<u>Year</u>	<u>Population</u>
1960	5,515
1970	6,652
1980	Unknown in the late 1970's

However, actual population in 1980 showed only a minor increase from 1970; 63 person increase or about one percent. The 1980 population of the Borough was 6,715 persons.

Since 1980 the population has not changed much as shown in the figures below. Nor, is population expected to change much in the foreseeable future.

1980	6,715
1990	6,597
2010	6,715 (county projection)

This leveling-off of population is mainly due to reductions in family size: (3.2 in 1970, 2.9 in 1980 and 2.7 in 1990) and lack of land for development.

Housing unit count has been, however, steadily increasing as witnessed by the Census figures below.

<u>Year Housing Built</u>	<u>Number of Units</u>	<u>Average Per year</u>
1960 - 1969	475	47.5
1970 - 1979	327	32.7
1980 - 1989	293	29.3

For the 10 year period 1984-1993, the average increase in housing is 21 units per year.* These figures show that while housing continues to be built in the Borough, the rate of development is clearly declining. This is due in large part to the lack of vacant developable land in the Borough.

Wastewater Management Study - 1987

In November, 1987 the Borough and its consultant (Malcolm Pirnie) published Wastewater Management Study. Again for background purposes the "executive summary" and other relevant sections are quoted herein.

* Based upon residential tax parcels as reported by the Tax Assessor.

Executive Summary

The existing wastewater treatment plant of the Borough of Bernardsville has inadequate capacity to treat current flows to required effluent limits for discharge to Mine Brook. The major deficiency is in the ability to satisfy nitrogen limits. Considering future needs, the best solution for the Borough based on the analyses of this report is a new treatment plant on the site of the old sludge drying beds. The existing plant would be used for sludge processing. The capital cost of this plan is \$3,400,000 in current dollars. The operating cost is \$219,000 per year in current dollars.

The treatment plant currently serves a population of about 3,900 in 1,345 dwelling units plus commercial and institutional facilities. Monthly average flows ranged from 200,000 gallons per day to 813,000 gallons per day from 1975 through 1983 and averaged 333,000 gallons per day over the same period. The wide range of monthly flows is caused by rain water and ground water leaking into the sewer system during wet weather.

A major problem discussed in the Wastewater Management Study is infiltration. The Study concluded: *"It would therefore appear that infiltration is entering throughout the collection system and, therefore, is most likely not cost-effective to remove".*

It appears that the Study's recommendation for expansion of the plant is in part motivated by peaking factors due to infiltration. For example, the future gallonage treatment is recommended to be 800,000 gallons per day of which 36 percent of the expected flow is infiltration/inflow.

The Current Sanitary Sewer System

The current sanitary sewer system was installed over a period of many years, however, the existing sewerage lines, pipes, and service area has remained little changed from at least 1979 to the present. Consistent with the recommendations of the 1987 Wastewater Management Study, the sewerage treatment plant was upgraded and presently the Borough is served by a modern 800,000 gpd facility.

In considering the relationship between the sewer system and planning, zoning and land use, the following observations are made.

1. Sewer service is provided in the denser developed and denser zoned areas of the Borough. Analysis of sewer service and zoning shows the following:

<u>Zones</u>	<u>Sewers</u>
C-1, OB and HD	Yes, eastern end of C-1 is not completely sewerred.
R-8	Yes
R-5	Yes
R-4	Yes, except small area fronting Mount Airy Road is not served.
R-3	Yes, except for Windwood Road and East of Finley Avenue.
R-2	Approximately 30% served and 70% not served.
R-1	No sewers, except in Brushwood.
R-1A	No sewers.
I	No sewers.

2. Extensions to the sewer system (since 1979) have from time to time occurred. Analysis of these extensions shows they have all been undertaken in conjunction with new development proximate to the existing sewerage system. Further, they have been constructed by the respective developer/builder of the subdivision. Examples are: Rolling Hills, Laurel Lane, Chestnut Ridge and Brushwood. In the Chestnut Ridge subdivision fronting Pill Hill Road, sewers will be installed by the builder.

3. There are no known recent extensions of the sewerage system into existing built-up areas.

Extension Of The Sewer System

From time-to-time, municipalities consider or are asked to consider extensions to the sewer system into existing built-up properties or neighborhoods. Traditionally, planning factors studied in evaluating extensions are as follows:

1. Status of the present sewer service. In most cases this involves analysis of septic systems in the neighborhood, i.e. age, failures, non-failures, etc.

2. Soil conditions. Analysis of soils in those areas experiencing septic problems will reveal whether the soil conditions are suitable or not for septic and/or replacement of septic. Although with significant advances in design of modern septic and greater flexibility now allowed in design of individual systems, soils have become less of a hurdle or an inhibiting factor.

3. The availability of public water to serve non-sewered areas. If a neighborhood is

experiencing septic failures but is served by public water, the health and safety issue while important, is less critical than if that same property or neighborhood relies on both individual wells for potable water and on individual septic systems.

4. The Wastewater Management Study - 1987 initially identified seven neighborhoods for possible extension of the sewer service system. For a variety of reasons as expressed in that Study, the extensions were finally not recommended and indeed have not taken place. Examination of extension into any one of these neighborhoods opens the door to extension into any or all these neighborhoods. Thus, any study or consideration for extension would of necessity have to be made not for just one neighborhood but for all seven and perhaps even more neighborhoods to arrive at a reasonable and coherent policy that is fair and applicable to all.

Recommendations - Sewer Service

Based upon the above information and most importantly the 1987 Wastewater Management Study, the following recommendations are established:

1. Presently, the existing sewerage treatment plant is plagued by serious infiltration during storm periods wherein capacity is exceeded. Despite numerous attempts to identify the source or sources of the problem, it remains undetected. The Borough should continue to study the problem.

Until this infiltration problem is solved, expansion of sewers is not recommended. As a general principle, single family residences on lots of one acre or greater are recommended to be served by individual septic systems.

2. The exceptions to this Borough policy are several fold, involving:

- a. Sewer service can be provided to infill development within the existing sewer service area. It is assumed this development will be housing on the few remaining vacant lots in the more densely developed neighborhoods of the Borough. Similarly, there are a small number of homes in the sewer service area that are not connected but should be connected. The Borough should require connection to the sewer system when these properties turn over from one owner to another.
- b. Extension is recommended to cover the few remaining C-1 properties east of Finley Avenue not presently served. This extension will preferably be undertaken by property owners when overall site improvements are proposed.

- c. Extension of sewer facilities in conjunction with new subdivision development at the fringes of the sewer service area is not recommended. Existing homes at the fringes of the sewer service area should be given priority as waste water treatment capacity becomes available. No sewer facility extensions are recommended for the R-1 zone district.

CIRCULATION PLAN ELEMENT

The Municipal Land Use Law identifies a circulation plan as follows:

A circulation plan element showing the location and types of facilities for all modes of transportation required for the efficient movement of people and goods into, about, and through the municipality, taking into account the functional highways classification system of the Federal Highway Administration and the types, locations, conditions and availability of existing and proposed transportation facilities, including air, water, road and rail;

Considering these issues, one of the principal problems which faces an older, established community is the utilization of a street pattern which so often was designed for the horse and buggy and not the automobile. With the overall pattern of street routes firmly established in Bernardsville which to a great extent has been dictated by the topography and physical conditions, the basic function of the Circulation Plan Element will be related primarily to traffic control and improvement. In order to achieve this, it is proposed that certain streets be designated in one of four classifications according to function. By doing so, the Borough will have a logical basis for traffic control and a program for improvement of those streets to accommodate both present and future traffic volumes.

Existing Traffic Circulation System

The Bernardsville traffic circulation system is oriented around the intersection of the two major thoroughfares, U.S. Route 202 and Mt. Airy-Anderson Hill Road. This intersection forms Olcott Square, a triangular-shaped area at the heart of the central business area of the Borough.

The system is classified into four categories: arterial roads, major collector and minor collector roads and local streets. A description of the function of each category, and the Borough roads falling into each category is presented below:

1. **Arterial Roads.** Arterial roads carry traffic to and through the Borough and are typically inter-regional roadways connecting abutting regions in the State. They also serve as feeder roads to regional highways. The one arterial road serving Bernardsville is:
 - U.S. Route 202 (Morristown Road, east of Olcott Square, and Mine Brook Road, west of Olcott Square)

This arterial actually runs through New Jersey from New York State to Pennsylvania.

Locally, it connects Bernardsville with Morristown to the north and Somerville to the south. For almost all of its length, it is a two-lane roadway. Although Route 202 is a Federal highway, its administration and maintenance is a State function.

2. Major Collector. Major collector roadways serve to collect traffic movements from residential, commercial and other land use areas of the Borough and connect to arterials and regional highways. Typically, in this area of the State, major collectors also serve to interconnect municipalities. Most major collectors in Bernardsville are County roadways.

- County Route 613; Finley Avenue connecting the east commercial area of Bernardsville with Basking Ridge and Bernards Township.
- County Route 525; Mendham Road connecting the Town Center of Bernardsville to Mendham Borough to the north. It continues south from the Town Center as Mount Airy Road to its intersection with I-287 in Bernards Township, I-78 in Warren Township and Route 22 and ends at Route 28 in Bound Brook.
- County Route 659; Claremont Road from its intersection with Route 525, Mendham Road at the horse trough, Turnbull Lane and Dryden Road north into Mendham Borough.
- Hardscrabble Road. This road was listed as a collector in the 1979 Comprehensive Master Plan. Since that date, it has gained heightened importance and traffic volumes as a major inter-municipal collector roadway between Mendham, Route 202, I-287 interchange, AT&T and Bernards Township.

Hardscrabble Road is typical of a number of roads in Bernardsville in which a narrow roadway combines with limited setbacks to restrict sight distance and thus restrict traffic flow. The lack of sight distance poses hazards for drivers and pedestrians alike.

The new classification as a major collector represents one of two municipal roadways that newly fall into the category and is the result of increases in commuter utilization during the AM and PM peaks traffic periods and its intermunicipal, I-287 and Route 202 interconnecting function.

- Anderson Hill Road. This roadway is an integral link between Route 525 (Mendham Road), the Town Center, Route 202 and the continuation of Route 525 (Mount Airy Road) south into Bernards Township. Currently, it is a municipal road. Its new classification as a major collector is due to its "missing link" position in what otherwise would be a continuous Route 525 through the Borough. Its increased

function as an interconnecting roadway between municipalities, I-287 interchange and heavy traffic volumes place it in the major collector category.

Both Anderson Hill and Hardscrabble Roads warrant study to identify improvements consistent with their function and substantially increased traffic volumes.

3. Minor Collector. A minor collector provides for traffic movement between major collectors and local streets, and provides direct access to abutting property. Typically, minor collectors are well traveled municipal roadways within the Borough that intersect with major collector or arterial roadway. The following municipal roadways function as minor collectors:

--	Liberty Avenue	--	Post Kennel Road
--	Pill Hill Road	--	Roebbling Road
--	Douglass Avenue	--	Ballantine Road
--	Mt. Harmony Road	--	Jockey Hollow Road
--	Campbell Road	--	Seney Drive
--	Old Army Road	--	Mullens Lane
--	Peachcroft Road	--	Mountain Top Road
--	Washington Corner Road	--	Lloyd Road
		--	Mine Mount Road

Many of the above roadways are characterized by narrow pavement widths, limited setbacks and winding alignment. For example, the hairpin turn on Mt. Harmony Road, and to a lesser extent, similar conditions elsewhere in Bernardsville, create hazardous movements. Traffic speed must be slow in order to traverse winding roads. Many of these roadways also have inadequate drainage which causes erosion during storm periods and icing during winter months.

There are few "solutions" to these long standing roadway issues. Substantial regrading and widening would "solve" the traffic problems but would seriously compromise the rural/suburban character of their respective neighborhoods.

4. Local Streets. Local streets provide direct access to adjoining properties, serve as easements for various public utilities, and provide light and air to adjacent buildings. They are not necessarily continuous for any length and comprise the bulk of the circulation system in the Borough. All Borough roads that have not been listed previously are local streets.

Borough. All Borough roads that have not been listed previously are local streets.

The primary reason for the reclassification of Hardscrabble and Anderson Hill Roads is the substantial changes in traffic flow due to I-287, its interchange location and the development of major employment centers immediately contiguous to Bernardsville's borders. The development of I-287 and its two major interchanges at North Maple Avenue and Mount Airy Road have added substantial traffic movements to, for example, Hardscrabble, Childs and Meeker Roads. The development of major office/employment centers at these same interstate intersection areas has also added significantly to peak hour commutation traffic on these same major and minor collector roadways.

Traffic Circulation Issues

1. Childs/Finley/Route 202 Intersection

The problems at this intersection include: sight distance difficulties caused by curves near the intersection on both Childs and Finley Avenues, a lack of similar alignment of both roads to Route 202, and heavy left turning movements from Route 202 westbound, and from North Finley. The intersection presently shows high numbers of accidents. Intersection redesign is warranted.

2. Truck Traffic.

There is a substantial amount of truck traffic generated by the quarry and plant located off Mine Brook Road (Route 202) west of the Town Center. This truck traffic conflicts with automobile traffic and congests the Town Center roadways and intersections. Trucks have a major problem turning right onto Mount Airy Road. Thus, reduction or elimination of this use should be encouraged as no longer appropriate. Lastly, introduction or expansion of uses in the quarry property which generate trucks should not be permitted.

There is also heavy truck traffic on Meeker Road which is a residential street. Traffic, and particularly truck traffic, is constricted by a one lane bridge on Meeker Road. Trucks also congest Mount Airy and North Finley Roads.

Much of this truck traffic arises from the quarrying of trap rock at the Millington Quarry on South Finley Road in Bernards Township and the conversion of the rock to asphalt at the former quarry in Bernardsville, plus later delivery of the same to highway construction sites elsewhere. Bernards Township refuses to permit removal of the asphalt-making equipment in Bernardsville to the active quarry in the Township. The consequence is the present distribution of the resulting truck traffic into Bernardsville over several inadequate

roads rather than to channel it onto a single artery.

3. Route 202 East.

Multiple commercial ingress-egress points, particularly in front of the two shopping centers, cause traffic congestion. There are numerous rear-end accidents, mostly at low speeds in front of these commercial driveways. The 1979 Comprehensive Master Plan proposed a jug-handle plus traffic light "solution" for this area and problem. That was not implemented and may have been an extreme remedy to the problem. The recent resurfacing and roadway striping by the State is a substantial improvement to the roadway, but has not "solved" the accident and congestion problem.

There are many left turning movements in and out of the Bernardsville Plaza Shopping Center and Shop-Rite supermarket on Route 202. As there is no left turn lane, however, these movements take place from the main roadway. Through-traffic must wait until the turning movements are completed.

The area needs further study. However, reducing driveways and creating "exit only" and "entrance-only" driveways are two short-term remedies. Access from the rear of the Shop-Rite property to N. Finley Avenue will remove south bound traffic from Route 202 and the Route 202/N. Finley Avenue intersection.

4. Claremont/Seney/Mine Mount/Intersection

This is a unique five-street intersection. It is the scene of accidents due to poor visibility and confusion due to the multiple intersections. It is particularly hazardous for students crossing to go to school. The intersection needs traffic control.

5. Olcott Square

During peak AM and PM commutation periods the center of the Borough at Olcott Square is congested. Part of this congestion is due to heavy truck traffic. As a consequence, vehicles are avoiding the square and using local streets and the new library driveway as a bypass.

6. Accessibility

Bernardsville lacks an alternate, continuous east-west thoroughfare to Route 202. The Campbell/Mountain Top/Post/Ballantine/Washington Corner sequence of roads performs this function in the Mine Mountain Sector. However, these roads are not completely aligned with each other, thus limiting the ease of movement from one part to another.

The steep grades from the Mine Mountain and Park Sectors to the rest of Bern-

ardsville also slow circulation. In winter especially, these differences create hazardous driving conditions.

These residential roads were not designed to carry the significant traffic volumes which they are presently experiencing; especially during AM and PM peak traffic periods

Traffic Circulation Issues As Identified By Bernardsville Traffic Officer

1. There are significant backups on Route 202 during the AM peak commuting hour. To avoid these backups, vehicles are utilizing other roadways in the Borough as a bypass. These roadways include Woodland, Essex, Claremont, Childs and Finley.
2. There are AM traffic backups on Anderson Hill Road. Vehicles are experiencing difficulties and long wait times to make the left turn onto Route 202. As a bypass, traffic is using Old Army Road and other residential streets.
3. The reverse patterns are observed during the PM evening peak hour.
4. Claremont, Seney and Mine Mount Roads converge at a 5-way intersection. Due to this convergence and poor visibility, accidents occur. There is a problem also when students seek to walk through the intersection and are required to cross four traffic conflict points. A traffic control device incorporating a traffic light at certain hours may be appropriate.
5. Truck traffic experiences extreme difficulty making a right turn from Route 202 onto Mt. Airy Road. Currently, Borough ordinance requires trucks to use Quimby Lane, Mill Street and Anderson Hill Road in order to make such a turn.
6. Meeker Road is experiencing heavy truck traffic from the quarry. The bridge over the Mine Brook is narrow creating difficulty for two large vehicles to pass.
7. In general, truck traffic throughout the Borough is problematic. Truck traffic is particularly high on North Finley, Meeker and Mt. Airy Roads. Heavy truck traffic creates a washboard pavement effect on portions of Route 202.
8. Route 202 in front of the shopping centers is characterized by multiple driveway entrance/exit points which cause low speed rear-end accidents.

9. Parking in the downtown is inadequate at peak periods. There are conflicts between parking of commuters, businesses, customers and residents.
10. There is a need for left turn signals at the two traffic lights in Bernardsville.
11. Narrow roads in the mountain area of the Borough experience drainage problems and icing during winter months.
12. Hardscrabble Road experiences significant traffic volumes going to and from AT&T and the I-287 interchange.

Sidewalks

Sidewalks function to provide pedestrian access to commercial uses, public facilities and importantly access to schools by students. Research of prior planning documents and in particular the 1979 Comprehensive Master Plan show that Plan presented specific sidewalk proposals and identified priority sidewalk locations. Review of this earlier Plan shows portions of the plan have been implemented. For example, sidewalks have been installed along Route 202 from the Town Center to North Finley Avenue and to the Town Center from the Borough pond. Recent site plan improvements to properties fronting Route 202 (east of North Finley Avenue) will complete pedestrian access along the entire length of this section of Route 202. The 1979 Plan for sidewalks yet to be completed, includes safe student access to Bedwell Elementary, the Middle School and Polo Grounds.

Installing new sidewalks along existing residential streets can cause concern as the residents may see the sidewalks as an urban element coming into their suburban neighborhood. To address this concern, not all sidewalks need be concrete. Macadam walkways can meander within the right-of-way and thereby provide pedestrian and student safety while retaining the ambiance of the neighborhood.

The installation of sidewalks, where needed, clearly addresses the primary goals of health, safety and general welfare for the Borough.

Assistance from the Board of Education in this process will be extremely helpful. Its data reveals the following number of walkers per school:

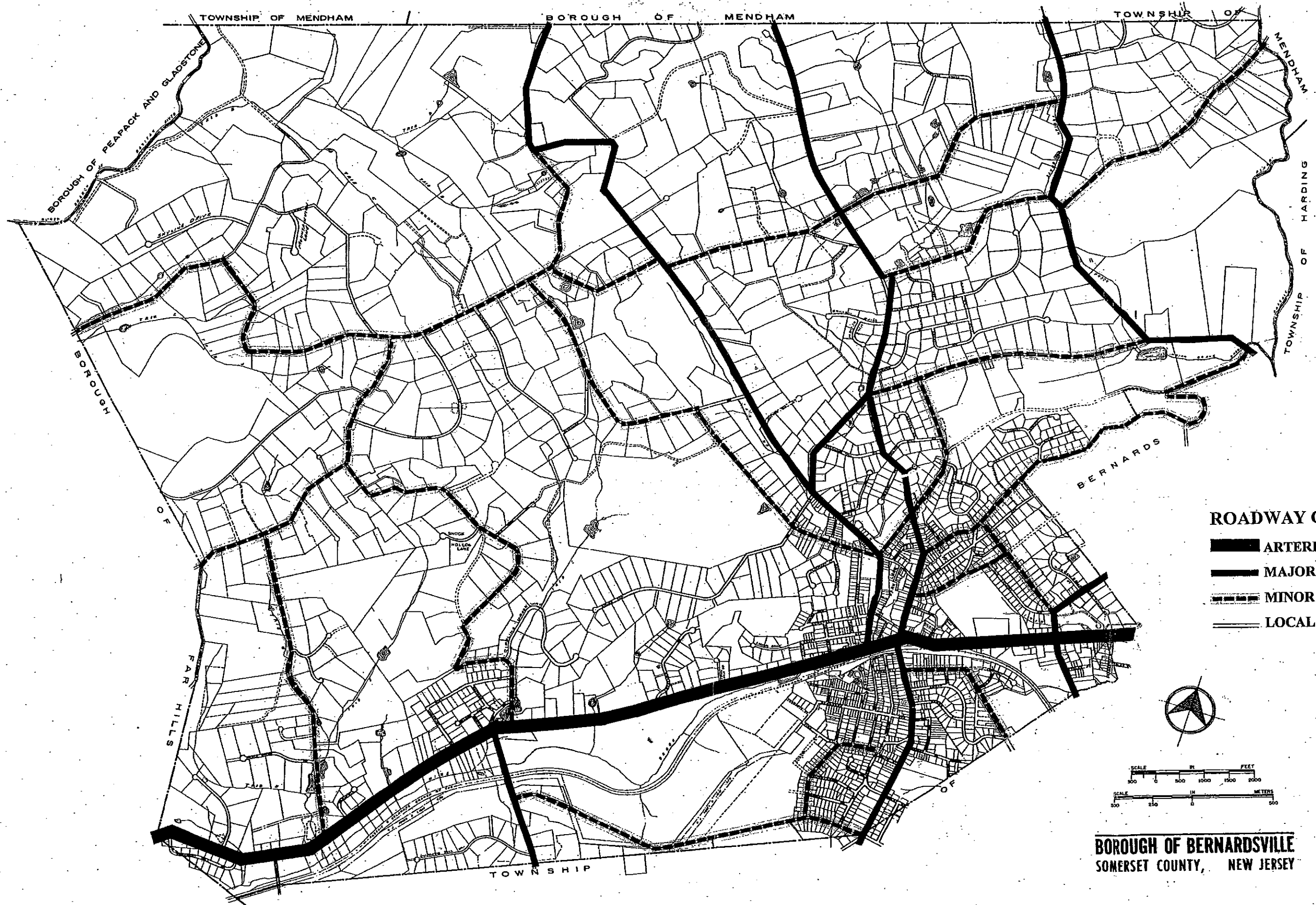
Bedwell	17
Middle School	75
High School	196

There are also walkers that attend St. Elizabeth's School.

Installing sidewalks in the following locations is recommended to promote school access safety.

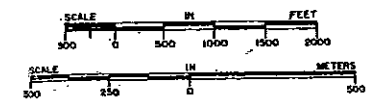
- Mendham Road from Stone Fence Road and Chestnut Road
- Mendham Road from Claremont Road to Sycamore Hill
- Entire length of Anderson Hill Road
- Childsworth Avenue from Olcott to Mullens Lane
- Entire length of Mullens Lane
- Entire length of Old Fort Road (West branch)

Provision of sidewalks at least along one side of the above roads will not only promote safe student access to schools and recreation areas but also reduce drop-off traffic and congestion.



ROADWAY CLASSIFICATIONS

- ARTERIAL
- MAJOR COLLECTOR
- MINOR COLLECTOR
- LOCAL



BOROUGH OF BERNARDSVILLE
SOMERSET COUNTY, NEW JERSEY

CONSERVATION PLAN ELEMENT

The Municipal Land Use Law identifies the contents of a Conservation Plan Element as follows:

A conservation plan element providing for the preservation, conservation, and utilization of natural resources, including, to the extent appropriate, energy, open space, water supply, forests, soil, marshes, wetlands, harbors, rivers and other waters, fisheries, endangered or threatened species wildlife and other resources, and which systematically analyzes the impact of each other component and element of the master plan on the present and future preservation, conservation and utilization of those resources;

While some of the above items are not relevant to Bernardsville, the following topics are presented in this plan.

Geology

The geology of Bernardsville is of interest since it is here that two major New Jersey rock formations meet. A fault that closely follows Route 202 separates the ancient igneous Precambrian gneiss, which forms the mountains of North Jersey, from the red shale characteristic of Somerset County and of middle New Jersey. The quarry hill is a basalt intrusion into the shale, and marks the end of the Watchung range. The nearby Great Swamp is the remaining evidence of an outflow lake of the great Wisconsin Glacier which stopped just north of Bernardsville.

Topography

Topography plays a distinct role in how a community develops. Historically, accessibility and development follow the lines of least topographic resistance. Flatlands generally develop first and, where practical, hilly areas follow. Topography in the Borough of Bernardsville can be characterized as hilly as shown on the accompanying "Topography And Excessive Slope" Map. In most cases, the hills are variably sloping but in some cases there are areas of steep slopes. The highest elevations are found in the center of the Borough near Mountain Top Road and in the northerly half of the Borough adjacent to Claremont Road. Elevations in these areas gradually reach 800 feet and above. The more precipitous areas of the Borough (although not as high) are found in the northeasterly section of the Borough in the area of Hardscrabble Road and the northwesterly section of the Borough adjacent to Peachcroft Drive. The Town Center is located on slightly hilly terrain with elevations ranging from 400 to 500 feet. The lowest area in the Borough is found in the southwestern corner of the Borough in the vicinity of Pheasant Hill Road south of Route 202. Elevations in this area are as low as 200

feet above sea level.

Steep slopes (over 15 percent) are susceptible to soil erosion. The soil on steep slopes is thin or shallow. This results in inadequate drainage area for septic waste disposal systems. The combination of steep slopes and thin soils is a severe limitation on construction.

Excessively flat areas can also be a problem when soils are impermeable or the water table is high. In such areas, water pools at or near the surface, flooding basements and backing up septic systems.

Watercourses

There are numerous small ponds, brooks and streams within the Borough and two major rivers are found on the Borough's boundaries. The North Branch of the Raritan River runs along a section of the northwestern boundary separating the Borough from Peapack and Gladstone Borough and the Passaic River runs along a section of the eastern boundary separating Harding Township and Mendham Township from Bernardsville.

Within the Borough there are three major watercourses. The predominant watercourse runs from Post Kunhardt Road along a course close to Claremont Road to the pond adjacent to the municipal building and continues on parallel to Route 202 until it crosses the municipal boundary southwest of Pheasant Hill Drive. This course is dominated by Mine Brook, which is fed by many small tributaries along the way and finally empties into the North Branch of the Raritan River. The predominant flow direction is to the southeast until crossing under Route 202, then southwest.

A second watercourse in the Borough runs from the area near Ballantine Road and Mendham Road in generally a northeasterly direction until it meets with the Passaic River. This course is dominated by Indian Grave Brook and is fed by numerous small tributaries. The third water course drains much of the area west of Dryden Road, north of Mountain Top Road and east of Clark Road. This water-course eventually empties into the North Branch of the Raritan River. A smaller brook located near Campbell Road runs in the same general direction and also empties into the North Branch of the Raritan River just north of Ravine Lake. Both of the above-mentioned brooks flow in a generally westerly direction.

Surface Water Characteristics

There are three major classifications of surface water:

1. Stream classification
2. Flood Plains
3. Wetlands

All freshwater streams throughout the State are classified by the NJDEP. This classification is divided into three categories.

- a. Trout Production. The only stream in this category is the North Branch of the Raritan River at the boundary between Bernardsville and Peapack and Gladstone, Indian Grave Brook and Passaic River, at the border with Harding Township up to I-287.
- b. Non-Trout. All remaining streams are non-trout.

Floodplains characterize all streams in the Borough. Floodplain width varies with each stream and the adjacent topography. Wetlands are found, almost exclusively along the streams that flow through the Borough. All property containing wetlands require identification and confirmation by the State DEP prior to development. All wetlands require a transition area or buffer. The size depends upon the resource value of the wetlands.

Depth To Bedrock

For many community development purposes, depth to bedrock is a limiting soil factor because it sets a bottom limit on the thickness of the soil mantle. Naturally, the kind of bedrock influences the use also. Hard, massive rock is difficult to break up or penetrate. Fractured shale or severely weathered rock may be nearly as easy to dig as soil. Some rock is much more porous than other. For homesites with septic field development, the presence of bedrock at a shallow depth is limiting.

Seasonal High Water Table

The level of free water in the ground is quite variable. The term "water table" is misleading in suggesting extreme uniformity. The surface of this "table" is ill defined and varies in depth according to topography, season and rainfall. A soil may appear to have a high water table because the general level of underground water has risen to the surface, or because water is perched on an impervious layer within the ground. A soil may also be wet because underground water wells up out of the rock at that point.

The seasonal high water level is usually most noticeable in late winter or early spring. Some soils, however, have high water nearly all winter. Water which is locally held (perched) in the soil by hardpans, clay pans or other impermeable layers, is included as a high water table. Water, which is moving within the soil on top of such layers, is considered seepage. High water table can inhibit

development dependent upon individual septic systems.

Septic Effluent Disposal

Residential building lots in the Borough dependent upon individual septic systems will range from 1 acre to more than 5 acres in size. Ground water pollution hazards in very rapidly permeable soils are recognized. Therefore, soil drainage, especially permeability and depth to seasonal high water table is of primary concern. Because most disposal systems must function year around, it is important that the depth to seasonal high water table be considered, not just depth to water table. Other factors to be considered include depth to bedrock, slope and stoniness.

Development Guidelines

Topographical features, drainage patterns, vegetation, and soils are the most important environmental considerations in locating residential uses. Of course, gently rolling, well-drained, thickly soiled lands would be the best for all uses from agriculture to industry, including residential. For housing, the steeper the slopes, the more expensive the construction, and the greater the dangers of erosion. As a general guide, where slope exceeds 15 percent, only very low densities are tolerable, and each lot should be carefully evaluated in terms of drainage, erosion, and sewage capability. There should be no building on slopes over 25 percent.

In areas of steep topography, excessive cuts and fills should be avoided. Housing and roads should be fitted into the natural pattern of the landscape, clustering the housing where necessary. Ridge lines should be left in their natural state and wooded crests maintained to avoid their exposure to the wearing elements of wind, rain, and erosion, as well as for aesthetic reasons.

Scenic Corridors and Roadways.

Throughout Somerset County and Bernardsville, there are scenic corridors and roads which are characterized by the unique and valuable visual presence they present to the public. Recently, the Somerset County Planning Board studied this issue and defined a scenic road as:

A public thoroughfare which traverses areas which provide travelers a substantial opportunity to view distinctive natural and man-made environments unique to Somerset County. Corridors and roadways possess elements of design which convey a sense of pleasing aesthetics or features which can include cultural, historic, recreational or other similar items which help to convey a sense of place or regional identity.

The second level of definition was formulated to classify the two types of scenic roads:

Scenic Corridor - the area of influence is generally extended beyond the properties immediately adjacent to the road and includes the entire landscape visible from the right-of-way.

Scenic Roadway - the area of influence is generally limited to the adjacent property or right-of-way and concentrates on the visual foreground adjacent to the roadway edge.

Consistent with these definitions, the Somerset County Planning Board identifies County Routes 525 (Mendham Road) and 659 (Claremont Road) as scenic roadways. Similarly, this Master Plan element identifies the following as scenic roadways:

- Douglass Avenue
- Ravine Lake Road
- Hardscrabble Road
- Stevens Lane (Private)
- Jockey Hollow Road
- Mt. Harmony Road (past hairpin turn) and,
- Dryden Road

While most local streets exhibit pleasing features, the above seven are particularly attractive due to their extensive and mature foliage in a steeply-sloping topographic area.

Consistent with preserving these scenic roadways, it is recommended that front yards in these areas conform to ordinance requirements and existing vegetation remain in the front yards to the maximum extent reasonable. Similarly, improvements to the roadway, drainage and pavement should be undertaken in a sensitive manner.

The major scenic corridor in Bernardsville is Route 202, Mine Brook Road, from the municipal pond to its border with Far Hills to the west. Highlighting this corridor is the municipal pond, municipal building and adjacent park, extensive farm property and estates which collectively contribute to the corridor's scenic vistas. Indeed, this area is the last rural farm landscape in Bernardsville. It is a valuable visual resource which conveys to the public a strong sense of Bernardsville's land use attributes, heritage and character.

Consistent with these findings, it is recommended that this scenic corridor be further studied to identify alternative means for its preservation. These "means" may range from establishing greater front yard setbacks to obtaining agricultural preservation funding for the purchase of development rights.

Great Swamp Watershed

The Great Swamp National Wildlife Refuge is located in adjacent Morris County but its watershed encompasses ten adjacent municipalities including a portion of Bernardsville. It contains 7,410 acres of wildlands administered by the U.S. Fish & Wildlife Service. The critical areas of this watershed within the Borough are along the Passaic River boundary between Bernardsville and Harding Township and stream tributaries to the Passaic River.

This easternmost sector of Bernardsville is characterized by the Jockey Hollow Historical National Park, Scherman-Hoffmann Wildlife Preserve Audubon Society, Polo Grounds Recreation Area, Middle and Bedwell Schools, vacant land and lower-density residential-uses. This watershed also encompasses the eastern end of Route 202 which is commercial and higher density residential. Except for infill and/or redevelopment, these land use patterns will remain.

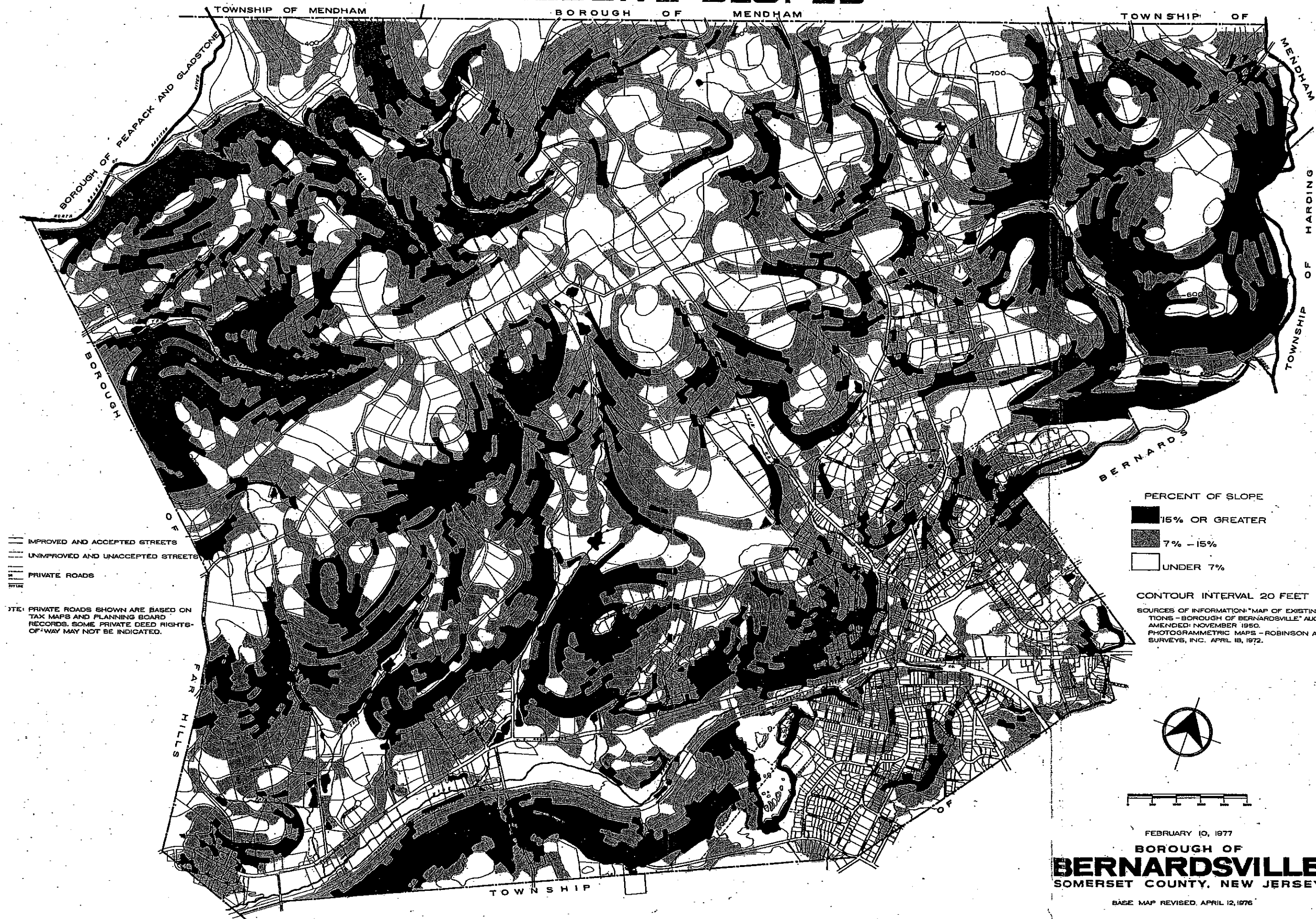
Recently, the Great Swamp Watershed Association published "The Great Swamp Greenway And Open Space Plan" (1998) wherein the above information is presented and plans for their protection are recommended. For Bernardsville, as well as throughout the watershed, the Plan recommends establishing 150 ft. buffering on all stream corridors feeding into the Passaic River and Swamp. The first 75 ft. of buffer from the stream should be planted with native trees and shrubs. The area outside the 75 ft. can be planted with grass or non-grass vegetation. It can be mowed or grazed with livestock.

It is recommended that this buffer recommendation be reviewed as to its applicability to the Bernardsville Great Swamp portion of the watershed and even the rest of the Borough as an appropriate means to protect the water quality of these streams and the environmental quality of the watershed.

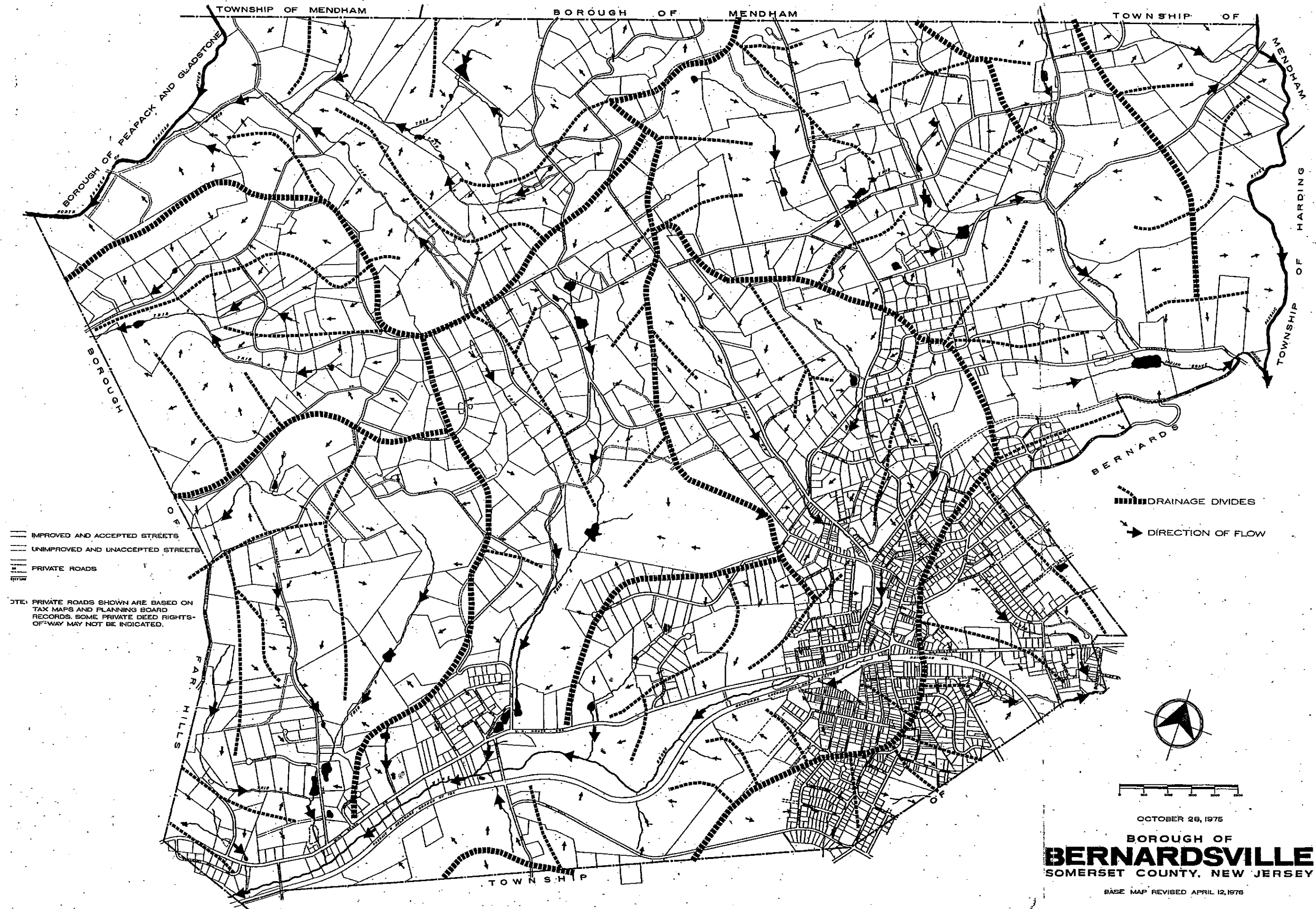
Environmental Resources Inventory

The Bernardsville Borough Environmental Commission published in May, 2002 an Environmental Resources Inventory ("ERI"). This document is added to the Conservation Plan Element. The ERI presents important information and identifies critical resources that should be considered in Borough decision making, planning and land use and environmental management.

TOPOGRAPHY AND EXCESSIVE SLOPES



SURFACE DRAINAGE



**Bernardsville Borough
Environmental Resources Inventory**

May 2002

**Prepared under the Direction of the
Bernardsville Borough Environmental Commission**

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Introduction

The goal of the Environmental Resources Inventory (ERI) is for it to be used as an aid to identify critical resources that should be considered in township decision making, planning and management. The information provided herein should be used in conjunction with the Bernardsville Borough comprehensive master plan which provides the framework for future development, redevelopment and preservation.

It is important to be aware that the scale of data represented in the ERI may not be correct for an individual lot or street location. Site specific data should always be requested and analyzed when specific sites are being evaluated. However, the ERI provides an invaluable tool when observing or evaluating the resources of the municipality. The *Application of the Data* section describes the data in more detail.

The ERI is an ever expanding document. As additional resources are documented, they should be added.

Geographic Information Systems

Geographic Information Systems (GIS) are computer based systems used to create, collect, manage, edit, manipulate, analyze and display geographic data. The power of GIS is particularly apparent when the quantity of data involved in spatial analyses are too large or too complex to be handled manually. What sets GIS apart from mapping software programs are its modeling capabilities, its ability to perform analyses on multiple data layers and combine the use of data layers from differing original scales.

The Upper Raritan Watershed Association (URWA) uses *ArcInfo* and *ArcView* software which makes URWA compatible with nearly all commercial, governmental and institutional data providers in New Jersey. *ArcInfo* and *ArcView*, developed by Environmental Systems Research Institute, are the most widely used GIS software packages in the United States today. They are used by the USDA Natural Resources Conservation Service (NRCS - formerly the Soil Conservation Service), US Geological Survey (USGS), NJ Department of Environmental Protection (NJDEP), NJ Office of State Planning (NJOSP), numerous county planning and health departments and many non-profit organizations in New Jersey.

Potential Municipal GIS Applications

GIS can be used as a tool to assist the municipal decision making process by providing a process to create, collect, manage, analyze and display data. GIS data analyses can be used to provide information for, but are not limited to, the following applications:

- ❑ Archaeology - Analysis of known sites to predict location of undiscovered sites using aspect, hydrography, slope and soil data.
- ❑ Development tracking - Analyze development trends using housing density, population density, land use/landcover, road, parcel and zoning data.
- ❑ Election management - Delineate election districts using population density and zoning data.
- ❑ Emergency response - Police, fire and ambulance vehicle routing using parcel and road data. Analyze frequency and location of emergency events by creating emergency sites data.
- ❑ Environmental planning - Ecosystem protection, watershed planning and management, water quality and quantity studies, land use trend analysis, greenway and open space planning, wellhead protection, river corridor protection, and wildlife habitat protection, using aspect, flood area, geology, hydrography, slope, soil, stream classification, watershed, wetland, parcel and zoning data.
- ❑ Facilities siting and management - Selection of location, planning and maintenance for municipal buildings and services, road, sewer, water and cable facilities using land use/landcover, parcel, roads, soil, wetland and zoning data.
- ❑ Land use records management - Record keeping, updating and archiving of land ownership, block and lot boundaries, zoning boundaries, easement boundaries, historic district boundaries, administrative districts, school districts, utility rights-of-way, road rights-of-way, railroad rights-of-way, tax assessment and collection, development trends and neighborhood demographics, using flood area, housing density, population density, hydrography, land use/landcover, parcel, road, trout stream classification, wetland and zoning data.
- ❑ Open space and recreation planning - Plan and maintain parks, historic sites, and hiking, biking and bridle trails using aspect, elevation, land use/landcover, parcel, slope, soil, wetland and zoning data.
- ❑ Transportation planning - Analysis of transportation network using county boundary, municipal boundary, flood area, geology, housing density, population density, land use/landcover, road, slope, soil, trout stream classification, wetland and zoning data.
- ❑ Vehicle routing - Optimize garbage collection, public transportation and school bus routing using road, parcel and zoning data.

Application of the Data

The Environmental Resources Inventory is designed to provide decision makers with a beginning frame of reference for land use planning, ordinance application and administration as well as overall environmental management. As such, these maps should not be relied upon as the sole source of information for decision making. Care must be taken to apply data at the correct scale and for the correct purposes. For example, the wetlands data, as mapped by NJDEP, may not accurately reflect location or boundaries on a given site. However, as a municipal overview, the information is of sufficient quality to allow for master planning, open space planning and other applications of appropriate scale.

Natural resources, by their very nature, provide such an investigative framework. This is due to the fact that natural resource phenomena are the result of orderly processes operating over time. A basic understanding of these processes is a fundamental prerequisite to investigation and analysis. It is this understanding that will allow the user to convert environmental "data" to environmental "information" which has utility for the development of public policy and rational planning.

The framework used in the preparation of the Bernardsville Borough Environmental Resources Inventory is derived from the understanding of natural processes beginning with the most basic elements first, and proceeding to the derived or influenced elements. This leads us to what is termed the "from the ground up" approach. Using this approach we investigate our community from the most basic information and proceed to those elements which derive from it.

In actual practice we begin with geology, followed by topography and slope, and continue through soils, hydrology, land use/landcover and end with planning data. Clearly, these factors alone do not explain every factor of the natural resources of the community but they do provide important and useful information of a fundamental nature.

Geology

Using our selected investigation framework, the geologic conditions are seen as fundamental and thus are the first area of investigation. Natural forces, such as erosion, sedimentation, fluvial processes, weathering due to wind erosion and the action of freezing and thawing, to mention a few, have acted on the underlying geology for many centuries.

The results of these actions are visible in topography and landform. Thus, the high points, the low points and slopes are directly related to the geologic framework which underlies the landscape. Think of the geologic structures as the skeleton of the organism and you will begin with a useful analogy. It should be clear that the geologic structure is *extensive* (it is everywhere), *pervasive* (it influences multiple factors), *durable* (it is relatively permanent) and *determinate* (it dictates possible outcomes).

Each geologic formation is depicted by different colors and a key. The user is encouraged to develop an understanding of the terminology used to name the various formations by using various standard geologic references and perhaps even doing a little fieldwork to identify rock types.

Geologic information is valuable in municipal and private decision making processes. For example, a site plan review might use geologic information to assess the design's overall suitability to bedrock conditions, and the feasibility of excavation, rock blasting, anticipated problems of waste rock disposal, septic suitability, foundation adequacy and many other factors. In overall municipal planning, geologic conditions are one of the prime determining factors in the evaluation of groundwater availability.

Slopes

Typically in New Jersey slopes from 15% to 25% are regarded as critical and those 25% or greater are very critical. In some cases, slopes between 8% and 15% are also of concern, depending on the intended use. 0% to 8% slopes are generally not considered of concern.

Slope data are very useful in a number of municipal applications including site plan review, facilities planning, visual impact assessment, open space acquisition and agricultural preservation.

Soils

Information about soils is perhaps the most important layer of investigation for routine municipal planning and regulation functions. In addition, important insights can be gained about vegetative communities, wildlife habitat, agricultural capability and development suitability. Soils form generally in one of two ways. They either weather from underlying geology, sometimes referred to as the "parent material" or they are imported from nearby or distant locations by the actions of wind, water or ice. Soil formation is a complex process of interactions involving physical processes such as erosion, chemical processes such as dissolution and biological processes related to plants and animals.

Soils are a critical ecological element since they occupy the boundary between the living organisms and the non-living materials of our planet. They are intimately related to both surface and groundwater and to the plant and animal communities on the surface. Due to this importance, considerable attention should be given to this element in any planning process.

The NRCS Soil Survey Geographic Database (SSURGO) contains a wealth of information valuable to farmers, planners, environmental commissions, engineers and anybody else interested in soils. GIS is capable of providing numerous analyses, depicted on maps, of soil conditions ranging from basic physical factors such as permeability to more exotic information such as concrete corrosion rates. Typically, most municipal users focus on the degree of constraint for various uses such as septic tanks, road building and dwellings.

Keep in mind that boundaries in nature rarely conform to discrete lines. This is particularly true of soils that, in many cases, grade into one another. If you need more detailed information for a particular site, use soils data to generate appropriate questions and seek site specific data. Do not necessarily accept soils information on a site plan which appears to be merely an enlarged copy of a County Soil Survey map.

Surface Water Resources

Water/Wetlands

Water/Wetlands data were mapped by the NJDEP as part of land use/landcover mapping in 1986 and updated in 1995/7. This mapping is derived from interpreted rectified color infrared aerial photographs. The minimum mapping unit is one acre, meaning that small water and wetland areas (less than one acre) are not included in the data. Also, water and wetlands in heavily forested areas might not be mapped. The user is cautioned not to assume the absence of water and wetlands of small size or in heavily forested areas without site specific information. These are currently the best available data for planning purposes. Site specific field delineated data is generally assumed to be of greater accuracy but is only available on a site specific case by case basis.

Water/Wetlands data are shown using the Anderson Land Use/Landcover Classification scheme. However, the data also contain the most widely recognized and comprehensive water/wetlands classification referred to as the Cowardin Classification. There are two publications for a complete explanation of the classification system and excellent discussions of the importance of wetlands. These are: Classification of Wetlands and Deepwater Habitats of the United States, by Lewis M. Cowardin et. al, 1979 and Wetlands of New Jersey, by Ralph W. Tiner Jr., 1985. Both of these publications are available from the US Fish and Wildlife Service.

Open water areas are also included on the map so that a complete hydrologic system can be visualized. It should be remembered that, while each wetland is important individually, they do operate as parts of an overall hydrologic system. Thus, care should be taken to address each wetland question from a system perspective.

Also on the map are the boundaries of sub-watersheds as defined by the NJ Geological Survey. This information is important since New Jersey's Freshwater Wetlands Protection Act requires transition zones around wetlands, based on their "resource value classification". For wetlands considered to be of exceptional resource value, these protective zones extend 150 feet outward from the wetland boundary. Intermediate resource value wetlands require a 50 foot transition zone. Ordinary resource value wetlands require no transition zone.

The user is referred to the Freshwater Wetlands Act Rules (N.J.A.C. 7:7A) and the Freshwater Wetlands Protection Act (P.L. 1987, c. 156) for complete information on regulatory and statutory requirements.

Flood Hazard and Flood Prone Areas

Flood hazard and flood prone areas, located along rivers and streams, have been formed by the action of water over time. These areas are periodically inundated by floods. It should be kept in mind that floods are natural events which should be expected to recur at various times. Flooding may occur at any time of year. In New Jersey, flooding is often associated with early spring or late winter storms. Flood heights from these events are often greater than expected due to frozen ground and/or melting snow. Heavy summer thunderstorms can also cause an extremely rapid rise in smaller tributaries and in drainages which have extensive impervious cover. Floods are also often associated with tropical storms which sometimes occur in late summer and early fall.

Human alteration of land surface has the potential to materially influence the magnitude and frequency of flooding. Removal of natural forest cover is usually the first step in this process. Conversion of native forests to farmland had long ago taken place in most of New Jersey. These early conversions have been followed in many areas by the installation of various forms of impervious cover or by the compaction of formerly pervious soils. Taken together, these changes in surface condition increase the percentage of precipitation which runs off and also significantly increases the speed with which runoff takes place.

Thus, in order to protect the public health and safety the Federal Emergency Management Agency, US Geological Survey and New Jersey Department of Environmental Protection have combined topographic data (the shape of the near stream area) with anticipated flow information to produce maps which depict the areas *likely to be flooded in a given storm event*. Should better information become available, the development of upstream areas increase or if flood control projects are developed, the area subject to flooding may change its shape and location.

Land Use/Landcover

Land use/landcover mapping is of great utility in municipal planning. Patterns of development and undeveloped land are readily identified. Remaining open space areas are easily seen as are patterns of wetlands, forests and other natural features. Recognizing these initial patterns can assist local planners in developing future land use plans, open space acquisition and management of existing developed areas.

It should be made clear that land use and landcover are not synonymous terms although they are often mixed on map products. *Landcover* indicates a type or class of *land surface condition* while *land use* generally refers to *specific activities taking place within the landcover category*. For example, a landcover designation of "barren land" may include land uses such as landfills, active construction sites or surface mines. Likewise, the landcover category or "urban land" may include residential areas, commercial facilities or industrial installations. Generally speaking, landcover can readily be deduced from aerial photography while land use determinations may require detailed field verified surveys.

URBAN LAND

Characterized by intensive land use where the landscape has been altered by human activities. Although structures are usually present, Urban Land is not restricted to traditional urban areas. Included are Residential; Commercial and Services; Industrial; Transportation, Communication and Utilities; Industrial and Commercial Complexes; Mixed Urban or Built-up; Other Urban or Built-up and Active Recreational Land. These land uses include associated lands, buildings, parking lots, access roads, and other structures.

AGRICULTURAL LAND

All lands used primarily for the production of food and fiber and some of the structures associated with this production. These areas represent a significant land use in New Jersey. Includes Cropland and Pastureland; Orchards; Vineyards; Nurseries and Horticultural Areas; Confined Feeding Operations; and Other Agriculture.

FORESTED LAND

Any lands covered by woody vegetation other than wetlands. These areas are capable of producing timber and other wood products and of supporting many kinds of outdoor recreation. Includes Deciduous; Coniferous; Mixed Deciduous-Coniferous; and Brushland. Forested Land is environmentally important because it affects air quality, water quality, wildlife habitat, climate and many other aspects of the ecology of an area.

WATER

All areas within the landmass of New Jersey periodically covered with water. Includes Streams and Canals; Natural Lakes; and Artificial Lakes and Reservoirs. Not included are water treatment and sewage treatment facilities.

Streams and Canals

Rivers, creeks, canals and other linear water bodies that have a minimum width of 80 feet. For watercourses interrupted by control structures, the impoundments are placed in other appropriate water categories. Remote sensing of these features is not difficult. Colors on infrared photography range from light blue to black, and on the black & white photography the tones range from medium gray to black. The signature can be smooth or rippled depending on the conditions at the time of the photography. The greatest difficulty occurs when overhanging vegetation or shadows obscure the extent of the watercourses.

Natural Lakes

Water bodies larger than three acres that are non-flowing and naturally enclosed, including regulated natural lakes, but excluding reservoirs. Islands less than three acres are included in the water area. To identify this feature accurately, it is important to remember natural lakes are the results of ground water seepage and surface run-off of precipitation, whereas reservoirs are the result of man-made impoundments and are maintained primarily by linear watercourses. Remote sensing of this feature is simple. The signatures and attendant problems are discussed in the description of Streams & Canals.

Artificial Lakes and Reservoirs

Impoundments of water larger than three acres used for irrigation, flood control, municipal water supplies, recreation, landscaping and hydro-electric power or the result of an active extractive operation. Dams, bulkheads, spillways and other water control structures should be evident and are critical for accurately identifying these features. Also important to remember is that artificial lakes and reservoirs are charged primarily through linear watercourses. Photo identification should key on the non-linear shapes of these features, the water control structures, and the signatures discussed in the description of Streams & Canals.

WETLANDS

Areas that are inundated or saturated by surface or ground waters at a frequency and duration sufficient to support vegetation adapted for life in saturated soil conditions. Includes naturally vegetated swamps, marshes, bogs and savannas that are normally associated with topographically low elevations but may be located at any elevation where

water perches over an aquiclude. Wetlands that have been modified for recreation, agriculture, or industry are also included.

The wetlands of New Jersey are located around the numerous interior stream systems, and along our coastal rivers and bays. New Jersey, by its numerous different physiographic regions, supports various wetland habitats dependent upon physiographic and geological variables.

INTERIOR WETLANDS

These are generally found in non-tidal lowlands associated with primary, secondary and tertiary watercourses, and isolated wetlands. Included under this heading are all forested wetlands dominated by deciduous and coniferous trees, and non-tidal herbaceous marshes and savannas.

Deciduous Wooded Wetlands

Closed canopy swamps dominated by marshes, and isolated wetlands. The important canopy species include *Acer rubrum*, *Nyssa sylvatica*, *Fraxinus pennsylvanica*, *Salix nigra*, *Quercus bicolor*, *Q. phellos*, *Q. falcata*, *Liquidambar styraciflua* and *Platanus occidentalis*. These species combine to form a series of mixed hardwood lowland habitats throughout the entire state. They have photographic signatures that exhibit height, rough texture, and are dark blue-gray to dark gray or black on winter infrared, and gray to dark gray on panchromatic film.

Coniferous Wooded Wetlands

Closed canopy, dominated by coniferous tree species associated with watercourses, seeps, and low topographic land. Areas in northern New Jersey support *Tsuga canadensis*, *Larix laricina*, and *Picea mariana* as monotypic stands or mixed communities. Other species such as *Nyssa sylvatica* and *Chamaecyparis thyoides* may also be present. These species have photographic signatures that are varied in texture and are red to dark red on winter infrared film and dark gray to black on winter panchromatic film.

Deciduous Scrub/Shrub Wetlands

Communities composed primarily of young samplings of deciduous tree species such as *Acer rubrum*, *A. negundo*, *Liquidambar styraciflua*, *Alnus serrulata*, *Cornus stolonifer*, and *C. amomum*; and woody shrubs such as *Vaccinium corymbosum*, *V. macrocarpon*, *Spiraea alba*, *Viburnum dentatum*, *Rosa palustris*, *Myrica pennsylvanica*, *M. gale*, *Clethra alnifolia*, *Cephalanthus occidentalis* and *Rhododendron viscosum*, among others.

Herbaceous Wetlands

Dominated by various herbaceous species that are not connected or associated with tidal waters. Lake edges, open floodplains and abandoned wetland agricultural fields are locations for this cover type. Dominant species are *Leersia oryzoides*, *Phalaris arundinacea*, *Nuphar lutea*, *Polygonum arifolium*, *P. sagittatum*, *Typha latifolia* and *Phragmites*. The photographic signatures for these areas are both smooth-and rough-textured with little elevation, varied textured, and light blue-gray or tan color on winter infrared and light gray on the panchromatic photograph.

Mixed Forested Wetlands (Deciduous Dominant)

Mixed wooded wetlands with deciduous tree species greater than 50% but less than 75%.

Agricultural Wetlands

Cultivated lands that are modified former wetland areas, and which still exhibit evidence of soil saturation on the photography. These lands will exhibit the textural signature characteristics described for the other agricultural categories, but will have darker color and tonal signatures. Colors will range from blue-grey to black on winter CIR film and dark grey to black on panchromatic film. In addition, these agricultural wetlands also exist in areas shown on soil surveys of the US Soil Conservation Service to have hydric soils.

Disturbed Wetlands

Former natural wetlands that have been altered by some form of clearing, leveling, grading, filling and/or excavating, but which still exhibit obvious signs of soil saturation on the imagery. Because of the alterations, these areas do not generally support typical wetland vegetation, and may in fact be unvegetated. They do, however, exist in areas shown on the US Soil Conservation Service soil surveys to have hydric soils, and exhibit the darker tonal signatures associated with saturated soils on the photography. Colors of these areas will vary from grey to blue-grey to black on winter CIR film and grey to black on panchromatic film.

Managed Wetlands

Former natural wetlands that have been converted to lawns and stormwater management areas. These areas are not normally inundated.

BARREN LAND

Characterized by thin soil, sand or rocks and a lack of vegetative cover in a non-urban setting. Vegetation, if present, is widely spaced. Barren land such as beaches and rock faces are found in nature, but also result as a product of man's activities. Extractive

mining operations, landfills and other disposal sites compose the majority of man-altered barren lands.

Known Contaminated Sites

Known Contaminated Sites data are from the NJDEP Known Contaminated Sites List. These data were updated in April 2002 by URWA to reflect their current status from information provided by the remedial program case managers responsible for the sites.

Of the 22 sites located in Bernardsville Borough on the Known Contaminated Sites List in 2001, four are pending action, thirteen are active, three require no further action and two require no further action with restrictions placed on the property.

Contaminated Wells

There are currently four additional contaminated sites under investigation by the New Jersey Department of Environmental Protection. These sites have contaminated wells from chlorinated solvents. The addresses for these sites are:

13 Ticely Road
18 Ticely Road
23 Ticely Road
23A Ticely Road

To the knowledge of the Upper Raritan Watershed Association, these represent the best available data. However, the Upper Raritan Watershed Association does not, and cannot, accept responsibility for data produced by other agencies, institutions, organizations or individuals. Errors, omissions or inaccuracies in original data are the responsibility of the data producer, if other than the Upper Raritan Watershed Association.

Bernardsville Borough Environmental Resources Inventory

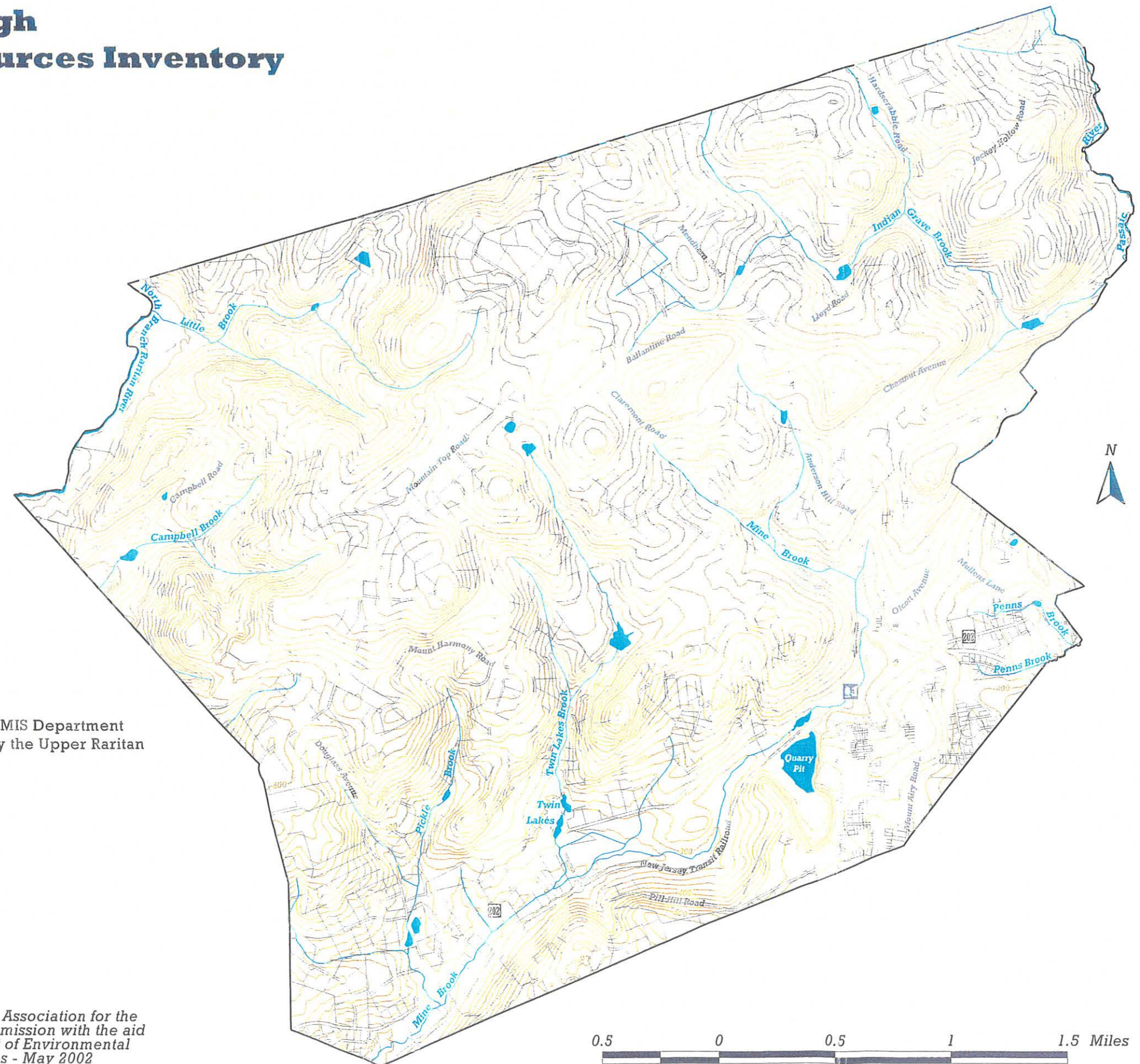
Elevation Contours

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
-  100 ft Contour Intervals
-  20 ft Contour Intervals

Contour data were derived from Somerset County MIS Department CAD elevation point data and further developed by the Upper Raritan Watershed Association in March 2002



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002

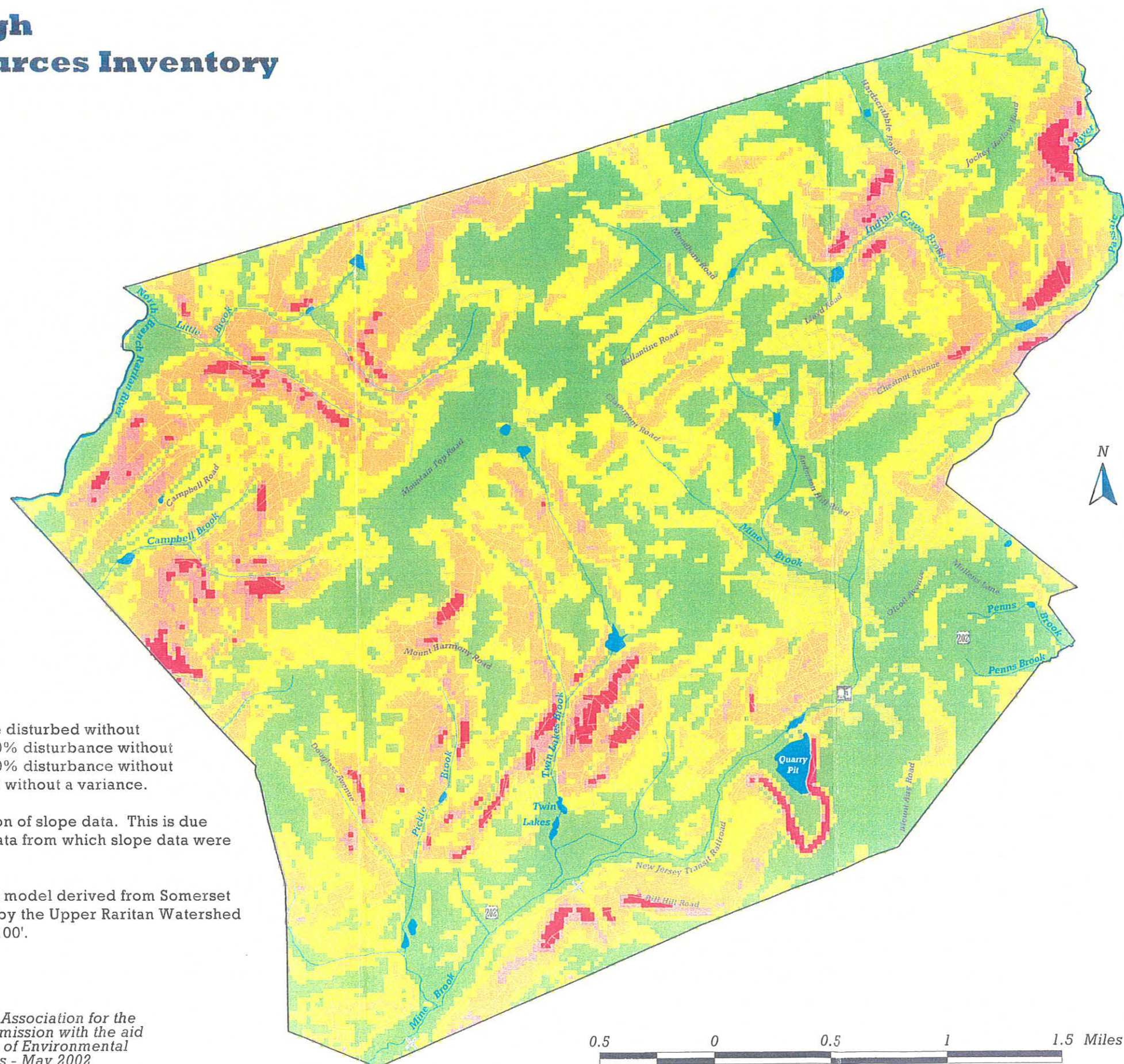


Slopes

- ## Slopes

Slopes	Area	Percent
0.000% - 8.000%	2,969.319 Acres	35.813%
8.001% - 15.000%	3,050.670 Acres	36.794%
15.001% - 25.000%	1,804.021 Acres	21.758%
25.001% - 30.000%	293.464 Acres	3.539%
30.001% - 57.816%	173.799 Acres	2.096%

Slope data were calculated from a digital elevation model derived from Somerset County MIS Department CAD elevation point data by the Upper Raritan Watershed Association in March 2002. Data cell size is 100' x 100'.



A horizontal scale bar with tick marks at 0.5, 0, 0.5, 1, and 1.5 miles.

Bernardsville Borough Environmental Resources Inventory

Bedrock Geology, Faults, Folds & Glacial Sediments & Aquifer Rank

- Municipal Boundary
- Parcel Boundaries
- Rivers & Streams
- Lakes & Ponds
- Geologic Folds
- Geologic Faults
- Glacial Sediments of the Jerseyan Age
- Bedrock Geology**
- Boonton Formation
- Hook Mt. Basalt
- Towaco Formation
- Preakness Basalt
- Feltville Formation
- Orange Mountain Basalt
- Passaic Formation
- Passaic Formation Conglomerate & Sandstone facies
- Leithsville Formation
- Hardyston Quartzite
- Hornblende Granite
- Microperthite Alaskite
- Potassic Feldspar Gneiss
- Biotite-Quartz-Feldspar Gneiss
- Hornblende-Quartz-Feldspar Gneiss
- Pyroxene Gneiss
- Quartz-Oligoclase Gneiss
- Hypersthene-Quartz-Oligoclase Gneiss
- Diorite
- Amphibolite

Bedrock aquifer rank and range of average yield of high-capacity wells in gallons per minute:

Group C/B (101 to 250 gpm/251 to 500 gpm) - Hardyston Quartzite, Leithsville Formation

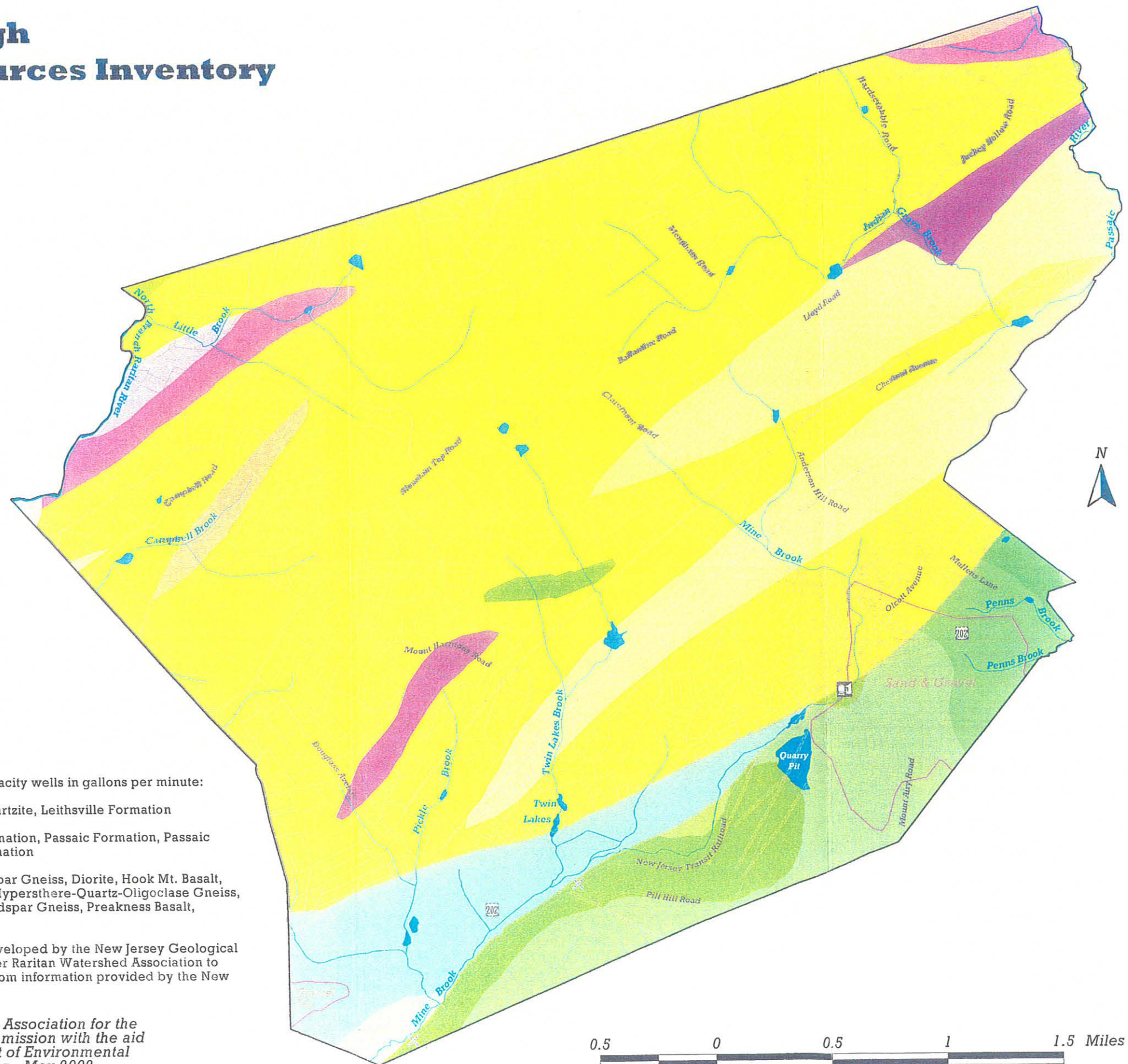
Group C (101 to 250 gpm) - Boonton Formation, Feltville Formation, Passaic Formation, Passaic Formation Conglomerate and Sandstone facies, Towaco Formation

Group D (25 to 100 gpm) - Amphibolite, Biotite-Quartz-Feldspar Gneiss, Diorite, Hook Mt. Basalt, Hornblende Granite, Hornblende-Quartz-Feldspar Gneiss, Hypersthene-Quartz-Oligoclase Gneiss, Microperthite Alaskite, Orange Mountain Basalt, Potassic Feldspar Gneiss, Preakness Basalt, Pyroxene Gneiss, Quartz-Oligoclase Gneiss

Bedrock geology, faults, folds and glacial sediments data developed by the New Jersey Geological Survey from 1998 to 2000. Further development by the Upper Raritan Watershed Association to integrate bedrock aquifer rank into the geology database, from information provided by the New Jersey Geological Survey, in May 2002.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Drainage

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Drainage**
-  Limitations

Soil ratings for drainage are affected by such soil properties as permeability, texture and structure; depth to claypan, rock or other layers that influence rate of water movement; depth to seasonally high water table; slope stability in ditchbanks; susceptibility to stream overflow; salinity or alkalinity; and availability of outlets for drainage.

All soils in Bernardsville Borough have one or more limitations for drainage.

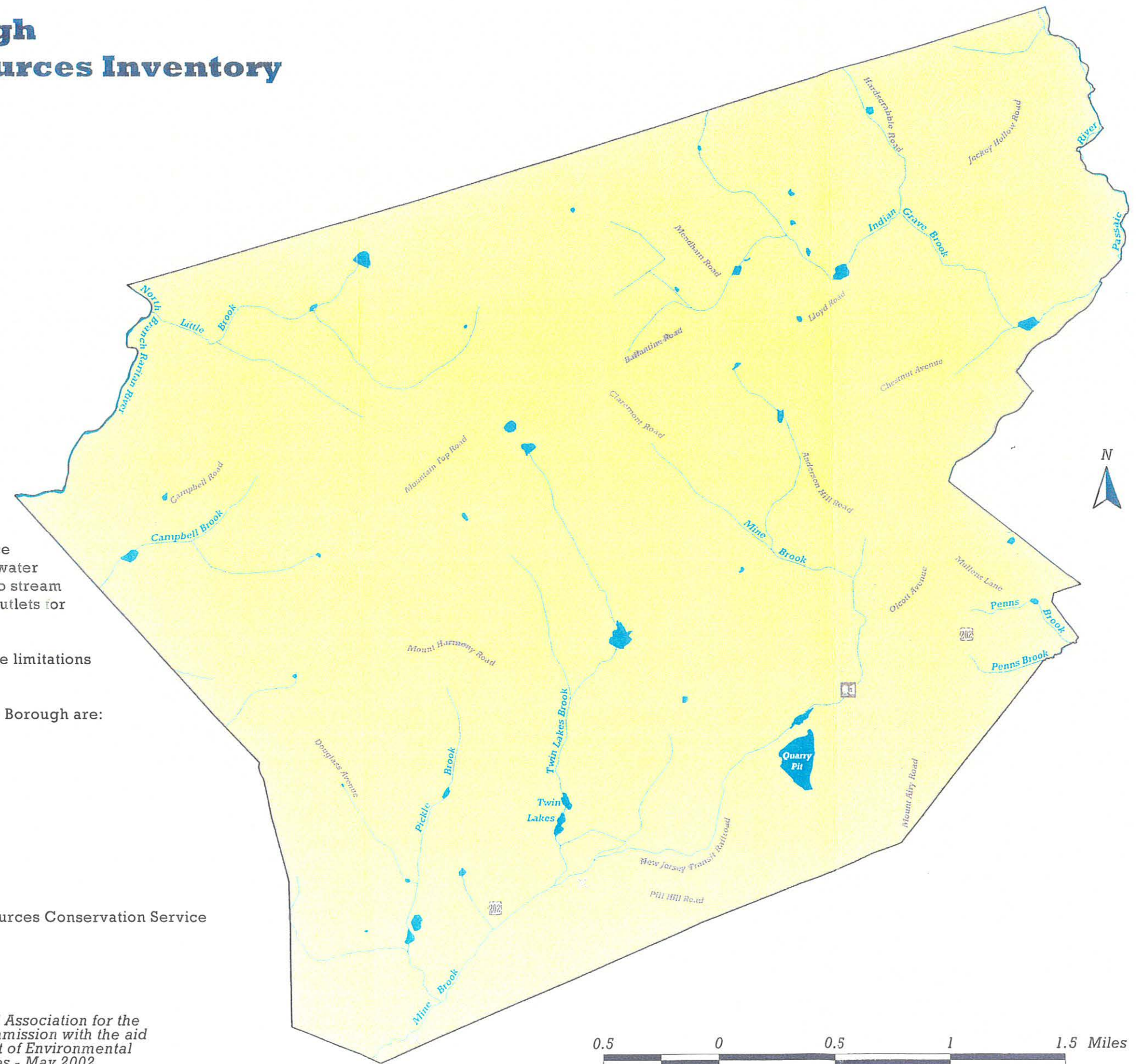
Limitations for drainage identified in Bernardsville Borough are:

- * flooding
- * frost action
- * slope
- * cutbanks cave
- * depth to water
- * depth to rock
- * percs slowly
- * ponding

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.






Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Dwellings with Basements

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Dwellings with Basements**
-  Slight Limitation
-  Moderate Limitation
-  Severe Limitation

Soil ratings for dwellings with basements are based on the properties of undisturbed soils. These ratings are for dwellings of three stories or less.

A rating of slight means soil properties are generally favorable for the rated use, or in other words, limitations are minor and easily overcome.

A rating of moderate means that some soil properties are unfavorable, but can be overcome by careful planning, design and management.

A rating of severe means soil properties are so unfavorable and so difficult to correct or overcome as to require soil reclamation, special design or intensive maintenance. Some properties are so unfavorable for a particular use that overcoming the limitations is most difficult and costly and commonly not practical for the rated use.

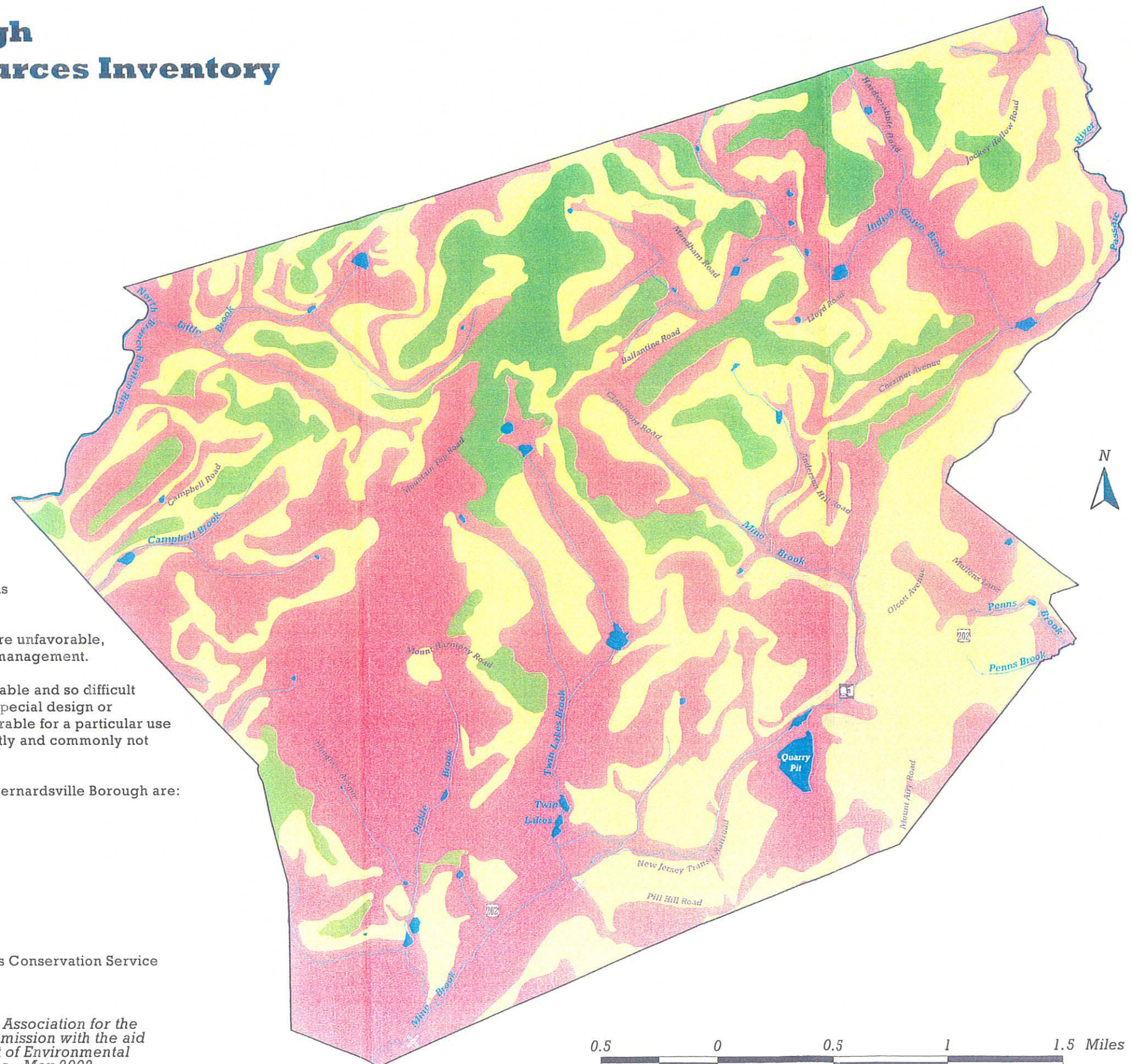
Limitations for dwellings with basements identified in Bernardsville Borough are:

- * flooding
- * shrink-swell
- * slope
- * wetness
- * depth to rock
- * large stones
- * ponding

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.








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Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Dwellings with Basements

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Dwellings with Basements**
-  Slight Limitation
-  Moderate Limitation
-  Severe Limitation

Soil ratings for dwellings with basements are based on the properties of undisturbed soils. These ratings are for dwellings of three stories or less.

A rating of slight means soil properties are generally favorable for the rated use, or in other words, limitations are minor and easily overcome.

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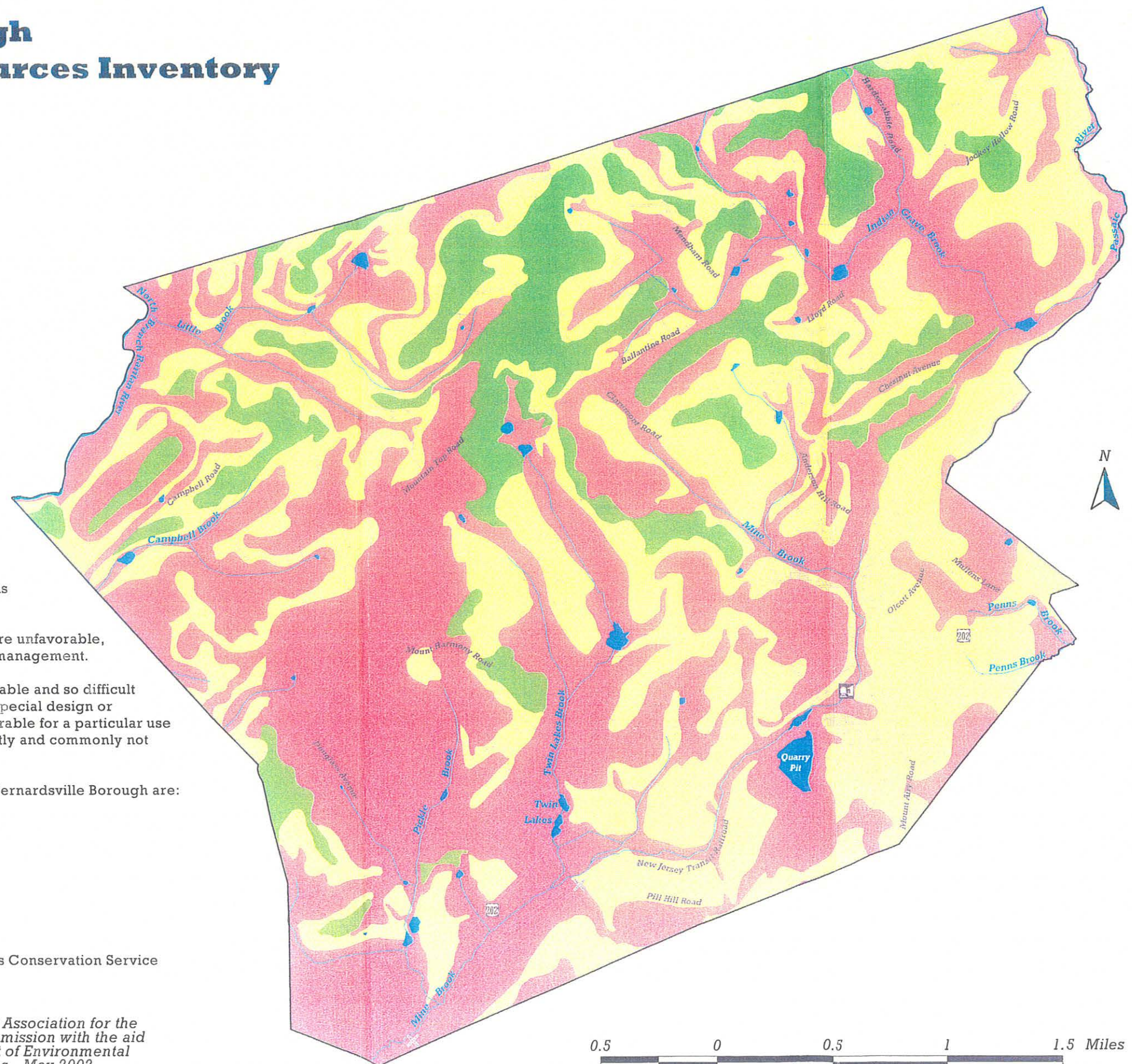
Limitations for dwellings with basements identified in Bernardsville Borough are:

- * flooding
- * shrink-swell
- * slope
- * wetness
- * depth to rock
- * large stones
- * ponding

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.



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Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Pond Reservoir Areas

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Pond Reservoir Areas**
-  Moderate Limitation
-  Severe Limitation

Soil ratings for pond reservoir areas are affected by the ability of soils to hold water behind a dam or embankment. Soils suitable for pond reservoir areas have low seepage, which is related to their permeability and the depth to fractured or permeable bedrock or other permeable material.

A rating of moderate means that some soil properties are unfavorable, but can be overcome by careful planning, design and management.

A rating of severe means soil properties are so unfavorable and so difficult to correct or overcome as to require soil reclamation, special design or intensive maintenance. Some properties are so unfavorable for a particular use that overcoming the limitations is most difficult and costly and commonly not practical for the rated use.

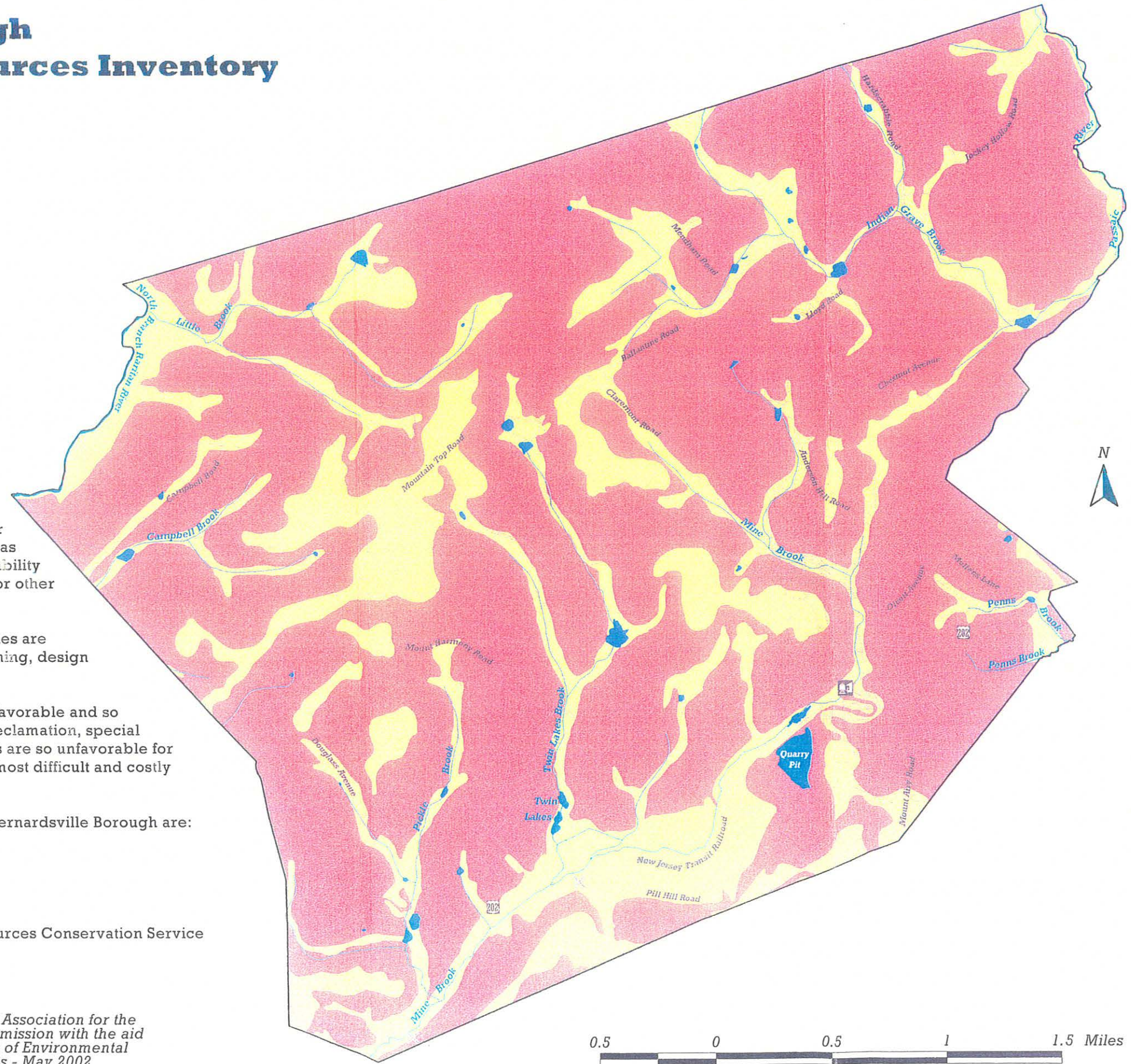
Limitations for pond reservoir areas identified in Bernardsville Borough are:

- * seepage
- * slope
- * depth to rock

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Paths & Trails

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Paths & Trails**
-  Slight Limitation
-  Moderate Limitation
-  Severe Limitation

Soil ratings for paths and trails are based on limitations of soils for local and cross country travel by foot or horseback. Design and layout should require little or no cutting and filling. The best soils are at least moderately well drained, are firm when wet but not dusty when dry, are flooded not more than once during the season of use and have slopes of less than 15 percent. There are few or no rocks or stones on the surface.

A rating of slight means soil properties are generally favorable for the rated use, or in other words, limitations are minor and easily overcome.

A rating of moderate means that some soil properties are unfavorable, but can be overcome by careful planning, design and management.

A rating of severe means soil properties are so unfavorable and so difficult to correct or overcome as to require soil reclamation, special design or intensive maintenance. Some properties are so unfavorable for a particular use that overcoming the limitations is most difficult and costly and commonly not practical for the rated use.

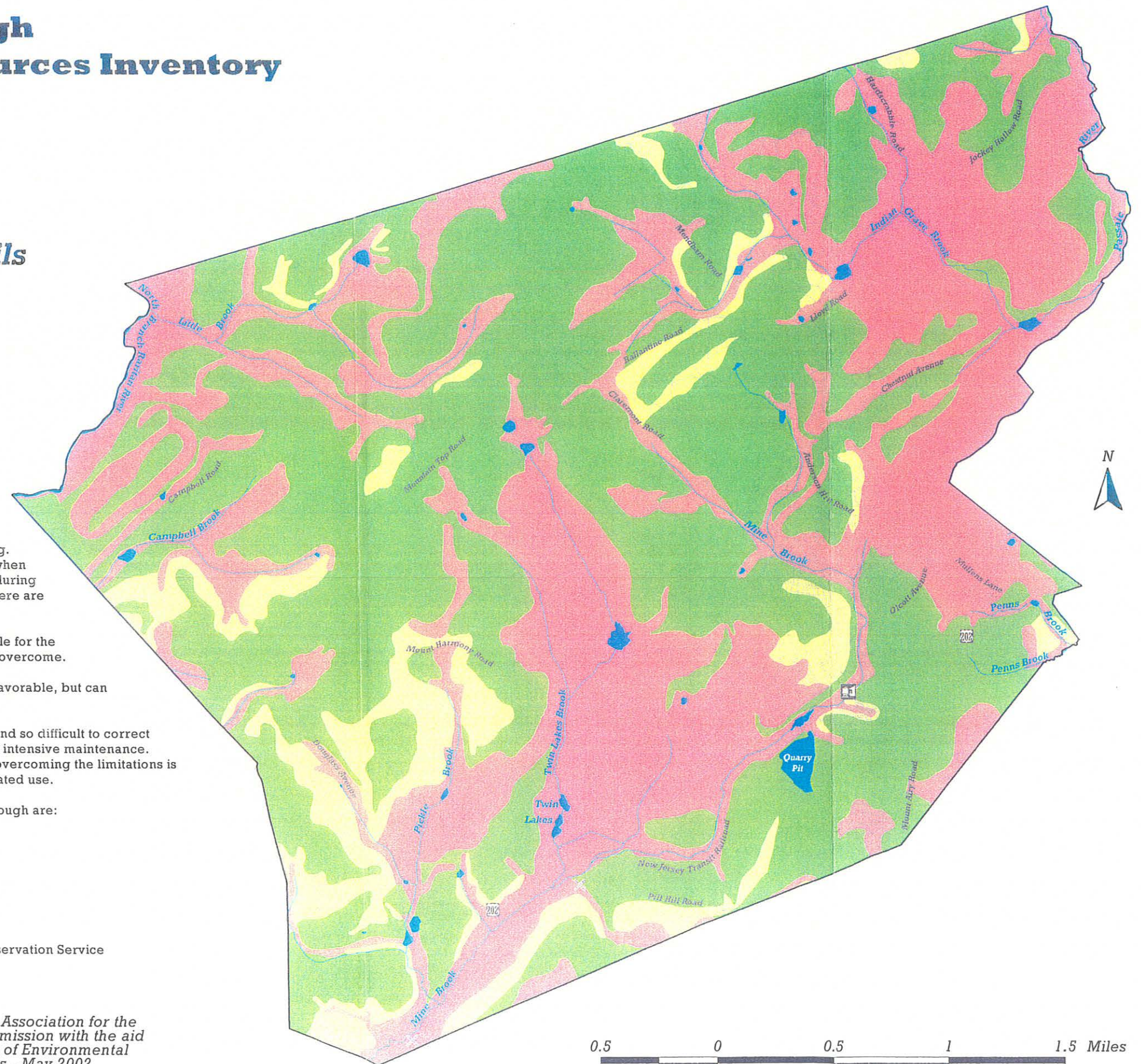
Limitations for paths and trails identified in Bernardsville Borough are:

- * erodes easily
- * large stones
- * slope
- * small stones
- * wetness
- * ponding

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Surface Water, Wetlands, Flood Areas, Subwatersheds & Watershed Management Area Boundaries

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
-  Wetlands
-  Flood Hazard Areas
-  Flood Prone Areas
- North & South Branch Raritan River WMA
- McVickers Brook Subwatershed
- Mine Brook Subwatershed
(including Pickle Brook
and Twin Lakes Brook)
- North Branch Raritan River Subwatershed
(including Campbell Brook and Little Brook)
- Upper Passaic River WMA
- Dead River Subwatershed
- Harrisons Brook Subwatershed
- Passaic River Subwatershed
(including Indian Grave Brook)
- Penns Brook Subwatershed

Rivers and streams data were generated by the New Jersey Department of Environmental Protection from USGS files in 1998.

Lakes and ponds data were derived from New Jersey Department of Environmental Protection land use/landcover data from 1995/97.

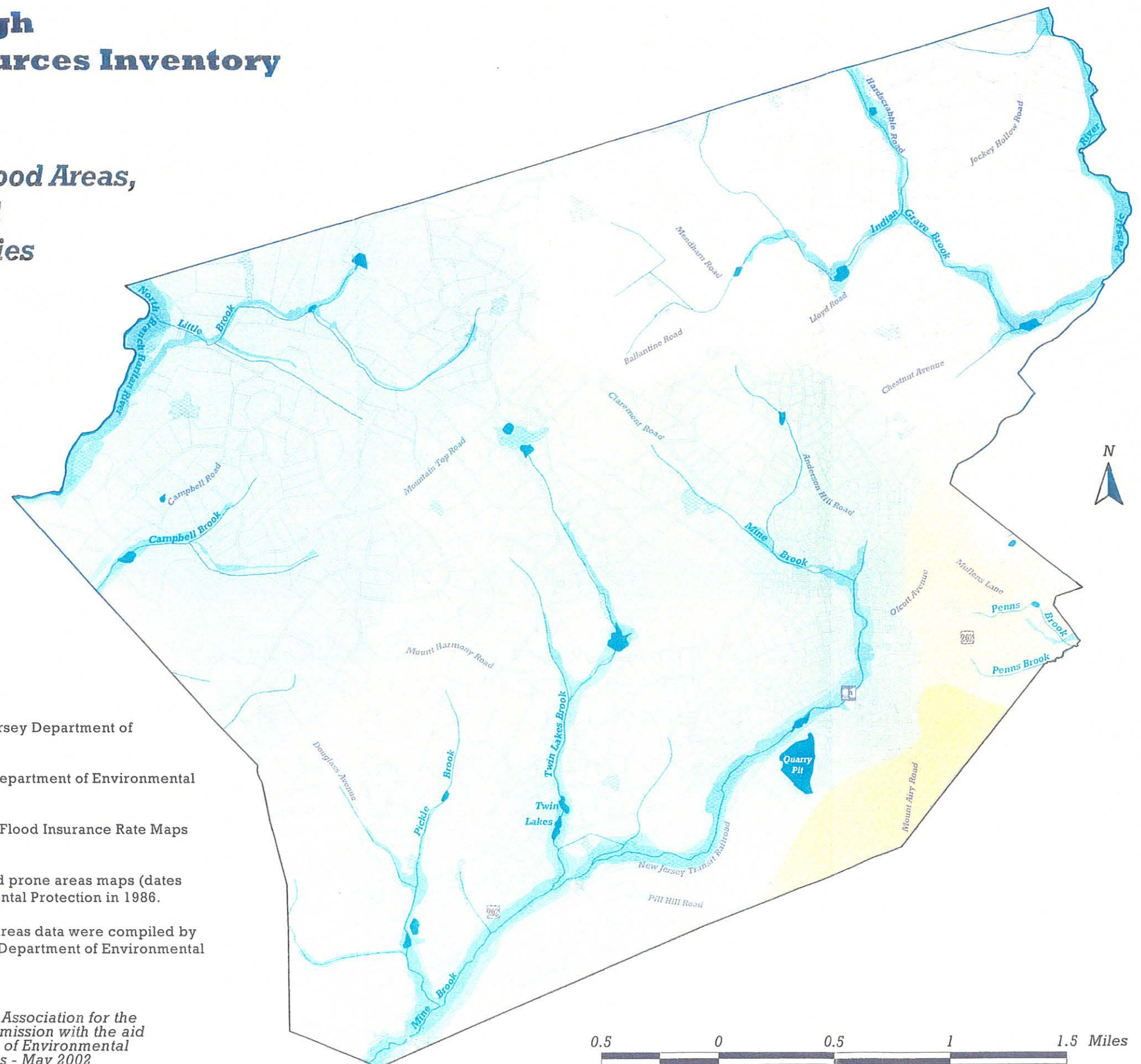
Flood hazard areas data were compiled by FEMA from Flood Insurance Rate Maps (dates unknown).

Flood prone areas data were compiled from USGS flood prone areas maps (dates unknown) by the New Jersey Department of Environmental Protection in 1986.

Subwatersheds (HUC14) and watershed management areas data were compiled by the New Jersey Geological Survey and the New Jersey Department of Environmental Protection from USGS data in 2000.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Local Roads & Streets

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Local Roads & Streets**
-  Moderate Limitation
-  Severe Limitation

Soil ratings for local roads and streets are based on the assumption that roads and streets will be paved.

A rating of moderate means that some soil properties are unfavorable, but can be overcome by careful planning, design and management.

A rating of severe means soil properties are so unfavorable and so difficult to correct or overcome as to require soil reclamation, special design or intensive maintenance. Some properties are so unfavorable for a particular use that overcoming the limitations is most difficult and costly and commonly not practical for the rated use.

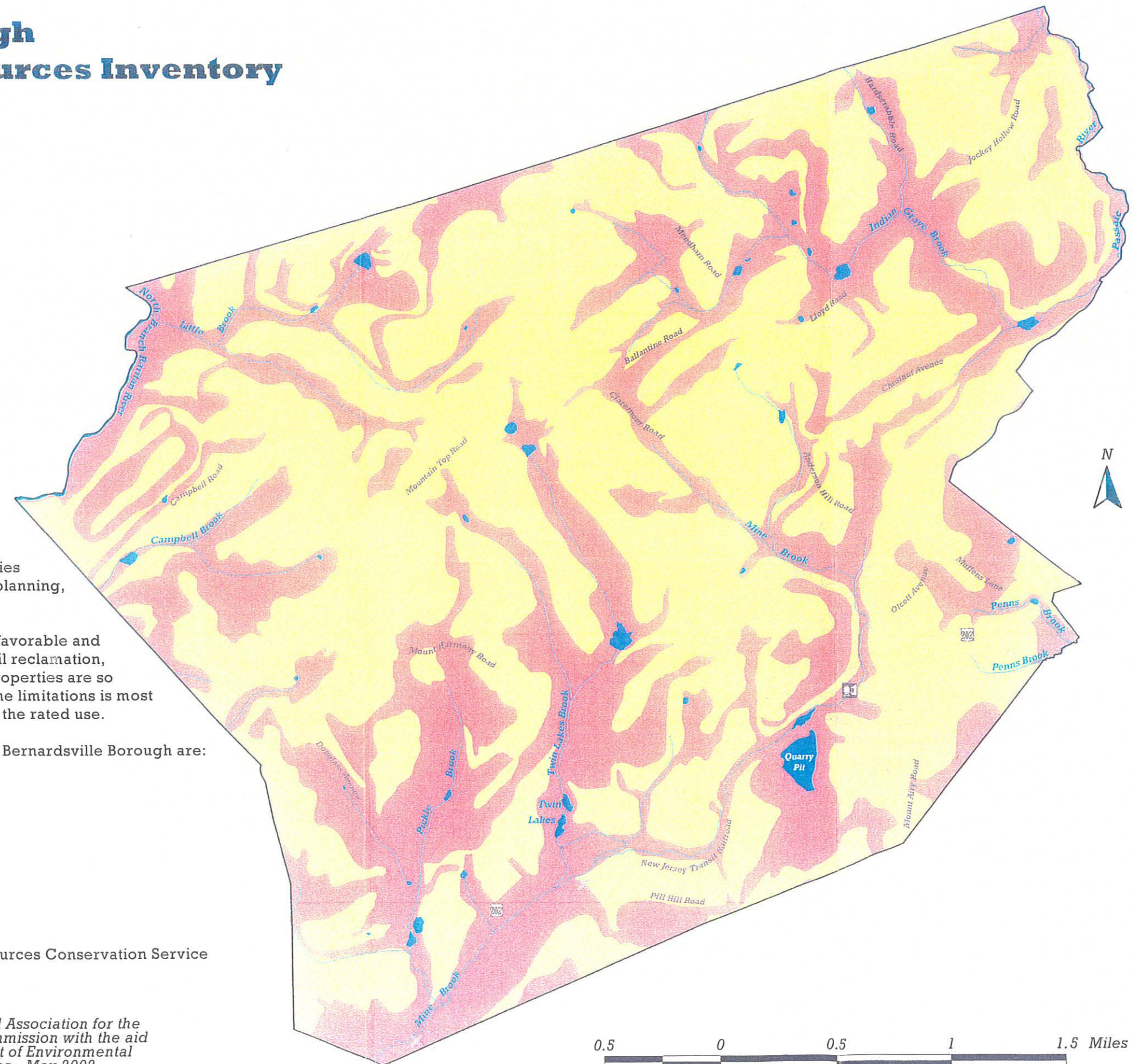
Limitations for local roads and streets identified in Bernardsville Borough are:

- * flooding
- * frost action
- * low strength
- * slope
- * depth to rock
- * large stones
- * wetness
- * ponding

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.








Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Soil Ratings for Septic Tank Absorption Fields

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
- Soil Ratings for Septic Tank Absorption Fields**
-  Moderate Limitation
-  Severe Limitation

Soil ratings for septic tank absorption fields are derived from requirements of the New Jersey Department of Health based on the Realty Improvement and Sewerage Facilities Act, Chapter 199. Soil ratings for septic tank absorption fields are considered applicable for residences on normal lot sizes, but not for public buildings or trailer parks.

A rating of moderate means that some soil properties are unfavorable, but can be overcome by careful planning, design and management.

A rating of severe means soil properties are so unfavorable and so difficult to correct or overcome as to require soil reclamation, special design or intensive maintenance. Some properties are so unfavorable for a particular use that overcoming the limitations is most difficult and costly and commonly not practical for the rated use.

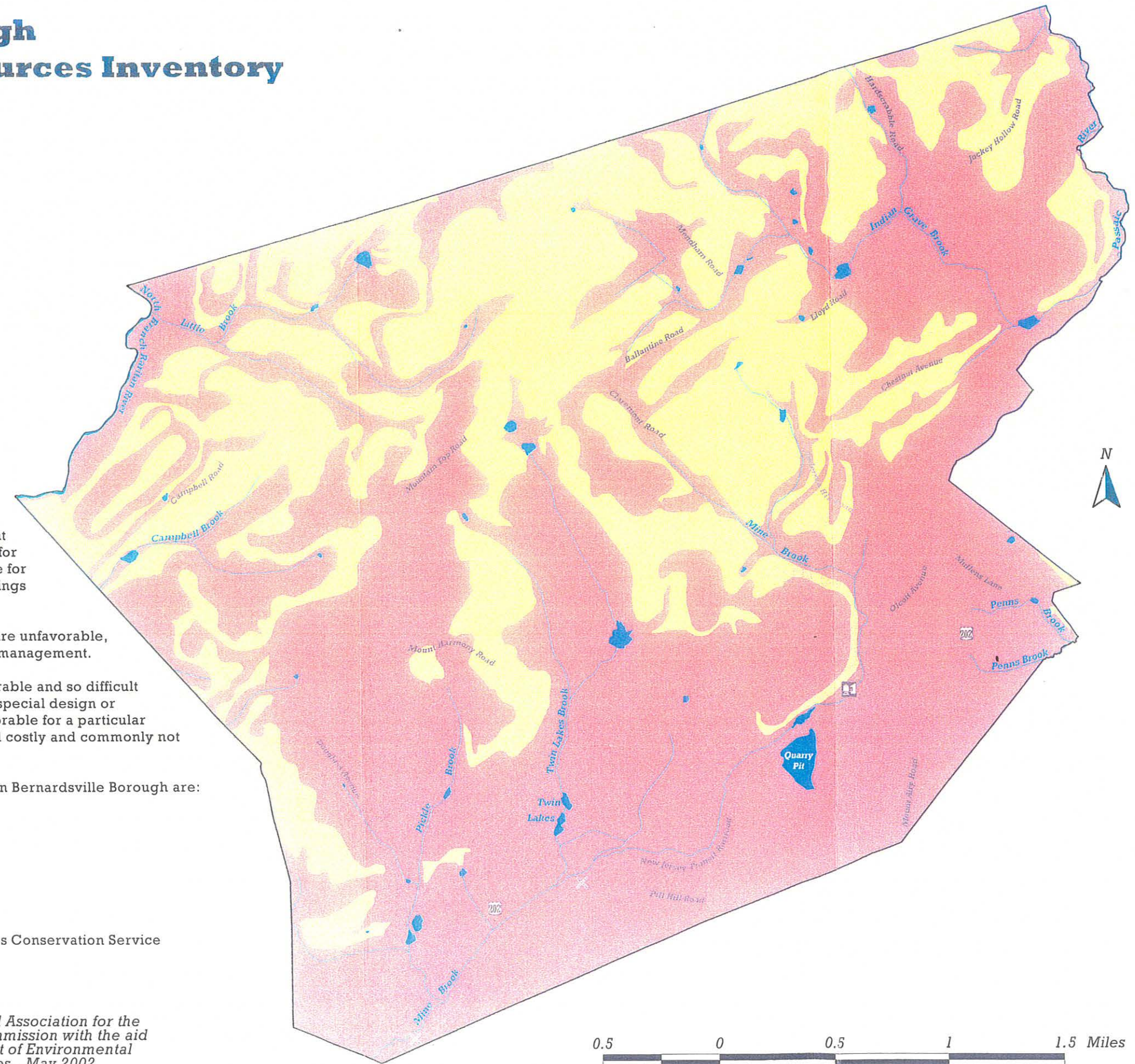
Limitations for septic tank absorption fields identified in Bernardsville Borough are:

- * flooding
- * percs slowly
- * slope
- * poor filter
- * depth to rock
- * wetness

Soils data were created by the USDA Natural Resources Conservation Service (formerly Soil Conservation Service) in 1997.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Known Contaminated Sites, Solid Waste Landfill & Land Use/Landcover

- NJDEP Known Contaminated Sites
- Contaminated Wells
- Solid Waste Landfill
- Municipal Boundary
- Parcel Boundaries
- Rivers & Streams
- Lakes & Ponds
- Land Use/Landcover**
- AGRICULTURE
- BARREN LAND
- FOREST
- URBAN
- WATER
- WETLANDS

Known contaminated sites data are from the New Jersey Department of Environmental Protection Known Contaminated Sites List in 2001. Only pending and active sites are shown on the map. These data were updated in April 2002 to reflect their current status, from information provided by remedial program case managers responsible for the sites, by the Upper Raritan Watershed Association in April 2002.

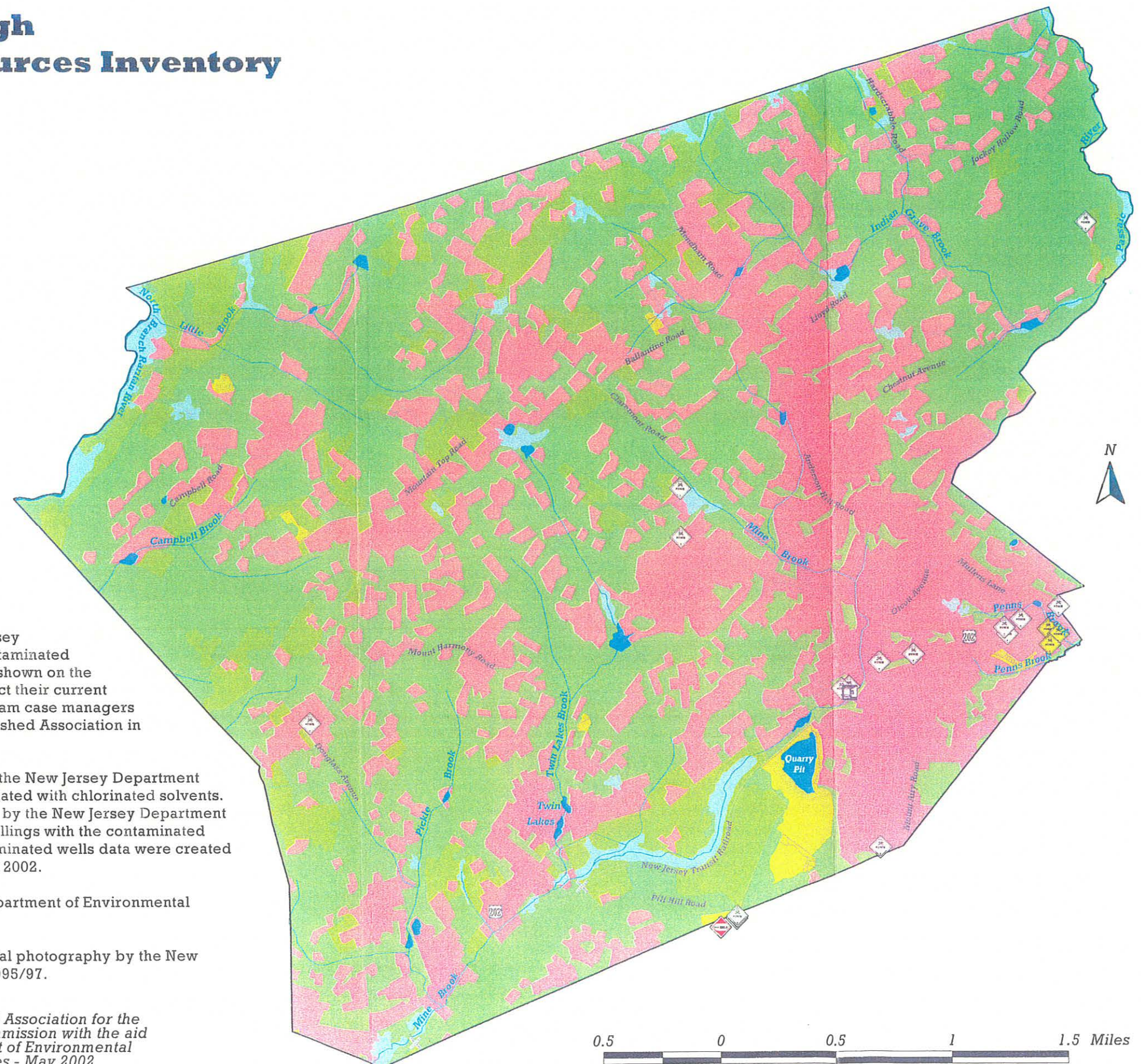
Information on contaminated wells was provided by the New Jersey Department of Environmental Protection. The wells are contaminated with chlorinated solvents. The investigation into the source(s) of contamination by the New Jersey Department of Environmental Protection is currently active. Dwellings with the contaminated wells have been provided with public water. Contaminated wells data were created by the Upper Raritan Watershed Association in April 2002.

Solid waste landfill data are from the New Jersey Department of Environmental Protection in 1997.

Land use/landcover data were interpreted from aerial photography by the New Jersey Department of Environmental Protection in 1995/97.



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Bernardsville Borough Environmental Resources Inventory

Critical Habitat Areas

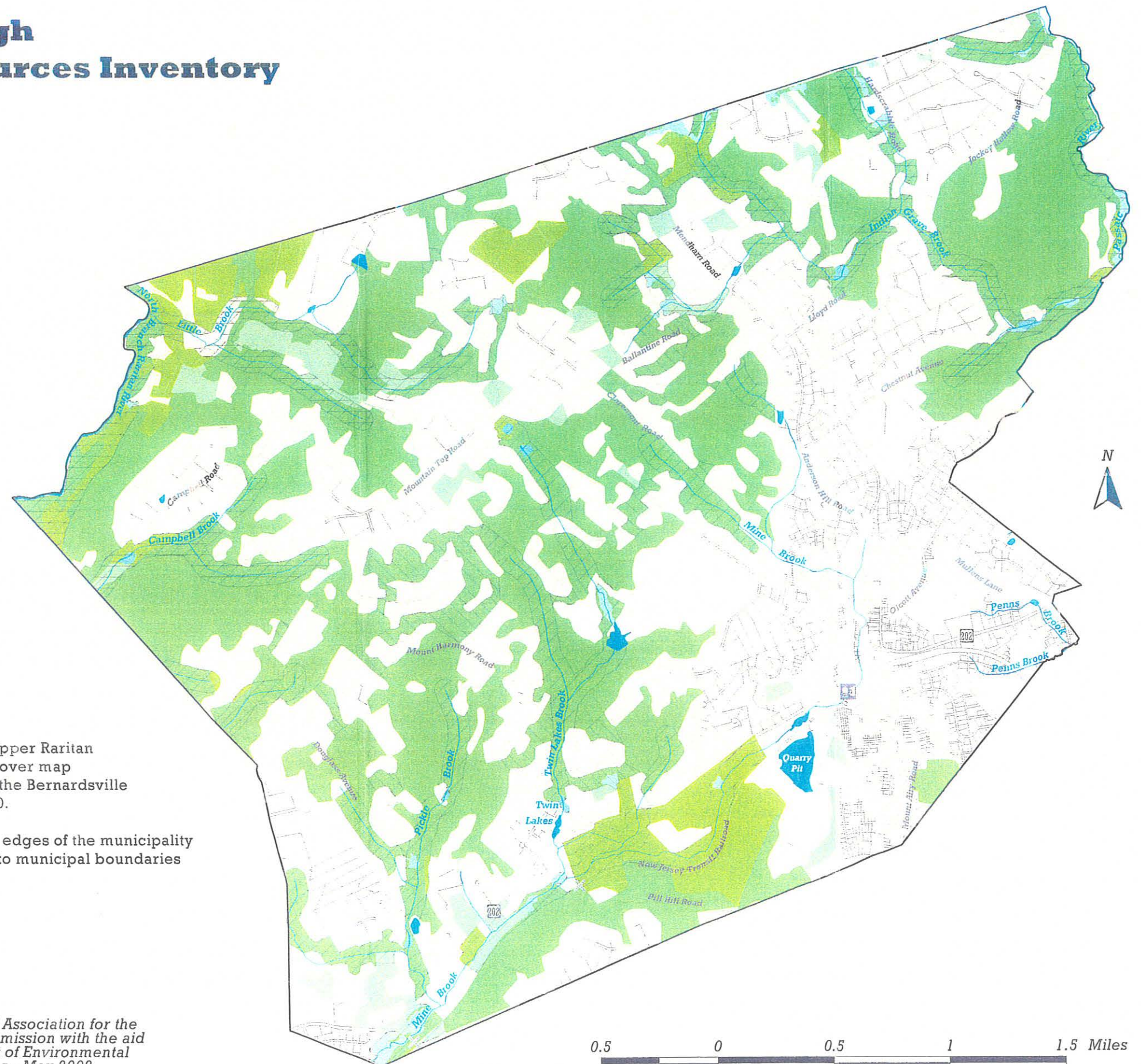
-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds
-  Stream Corridor
-  Wildlife Corridor
- Turtle Habitat**
-  Bog Turtle
-  Wood Turtle
- Critical Habitat Areas**
-  Forest
-  Brushland
-  Grassland
-  Water
-  Wetlands

Critical habitat areas data were produced by the Upper Raritan Watershed Association from a 1986 land use/landcover map interpreted by Wander Ecological Consultants for the Bernardsville Borough Environmental Commission in March 2000.

There are slight data gaps in some areas along the edges of the municipality where the critical habitat areas data were clipped to municipal boundaries used in the original project.



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0.5 0 0.5 1 1.5 Miles

Bernardsville Borough Environmental Resources Inventory

*NJDEP Division of Fish and Wildlife
Endangered & Nongame Species Program Landscape Project
Wildlife Habitat Mapping
for Community Land-Use Planning &
Endangered Species Conservation*

-  Municipal Boundary
-  Parcel Boundaries
-  Rivers & Streams
-  Lakes & Ponds

- | | |
|--|--|
| Emergent Wetlands | Grassland |
|  Suitable Habitat |  Suitable Habitat |
|  Special Concern |  Special Concern |
|  State Threatened |  State Threatened |
|  State Endangered |  State Endangered |
|  Federal T & E |  Federal T & E |
| Forested Wetlands | Forest |
|  Suitable Habitat |  Suitable Habitat |
|  Special Concern |  Special Concern |
|  State Threatened |  State Threatened |
|  State Endangered |  State Endangered |
|  Federal T & E |  Federal T & E |

Suitable Habitat - meets critical patch size, no sightings
 Special Concern - meets critical patch size, and sighting of species of special concern
 State Threatened - sighting of state threatened species
 State Endangered - sighting of state endangered species
 Federal T & E - sighting of federal threatened or endangered species

A patch is an area that meets specific requirements for size and shape.

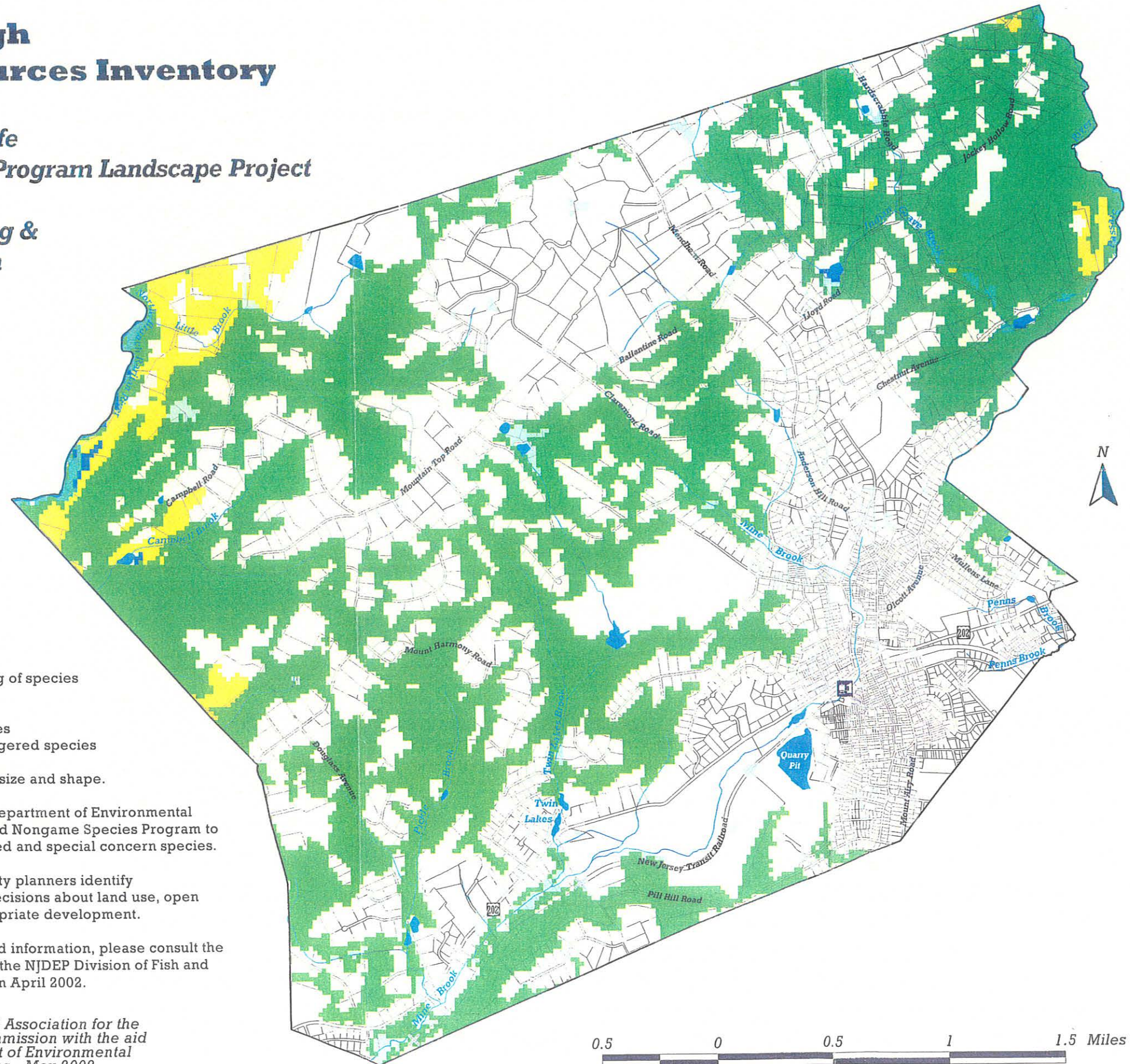
The Landscape Project is an effort by the New Jersey Department of Environmental Protection Division of Fish and Wildlife Endangered and Nongame Species Program to map critical wildlife habitats for endangered, threatened and special concern species.

Landscape Project data will help citizens and community planners identify environmentally sensitive areas and make informed decisions about land use, open space planning, identification of greenways and appropriate development.

For more information about Landscape Project data and information, please consult the New Jersey's Landscape Project CDROM produced by the NJDEP Division of Fish and Wildlife Endangered and Nongame Species Program in April 2002.



Produced by the Upper Raritan Watershed Association for the Bernardsville Borough Environmental Commission with the aid of a grant from the New Jersey Department of Environmental Protection, Office of Environmental Services - May 2002



Bernardsville Borough Environmental Resources Inventory

Open Space & Historic Sites

- Municipal Boundary
- Parcel Boundaries
- Historic Sites
- Rivers & Streams
- Lakes & Ponds
- Critical Parcels - Great Swamp Watershed Assoc.
- Open Space**
 - Municipal Open Space
 - County Open Space
 - Federal Open Space
 - Non-Profit Open Space
 - Schools
 - Private Golf Course

Municipal Open Space	166.008 Acres
County Open Space	117.546 Acres
Federal Open Space	182.299 Acres
Non-Profit Open Space	239.709 Acres
Schools	66.807 Acres
Private Golf Courses	288.656 Acres

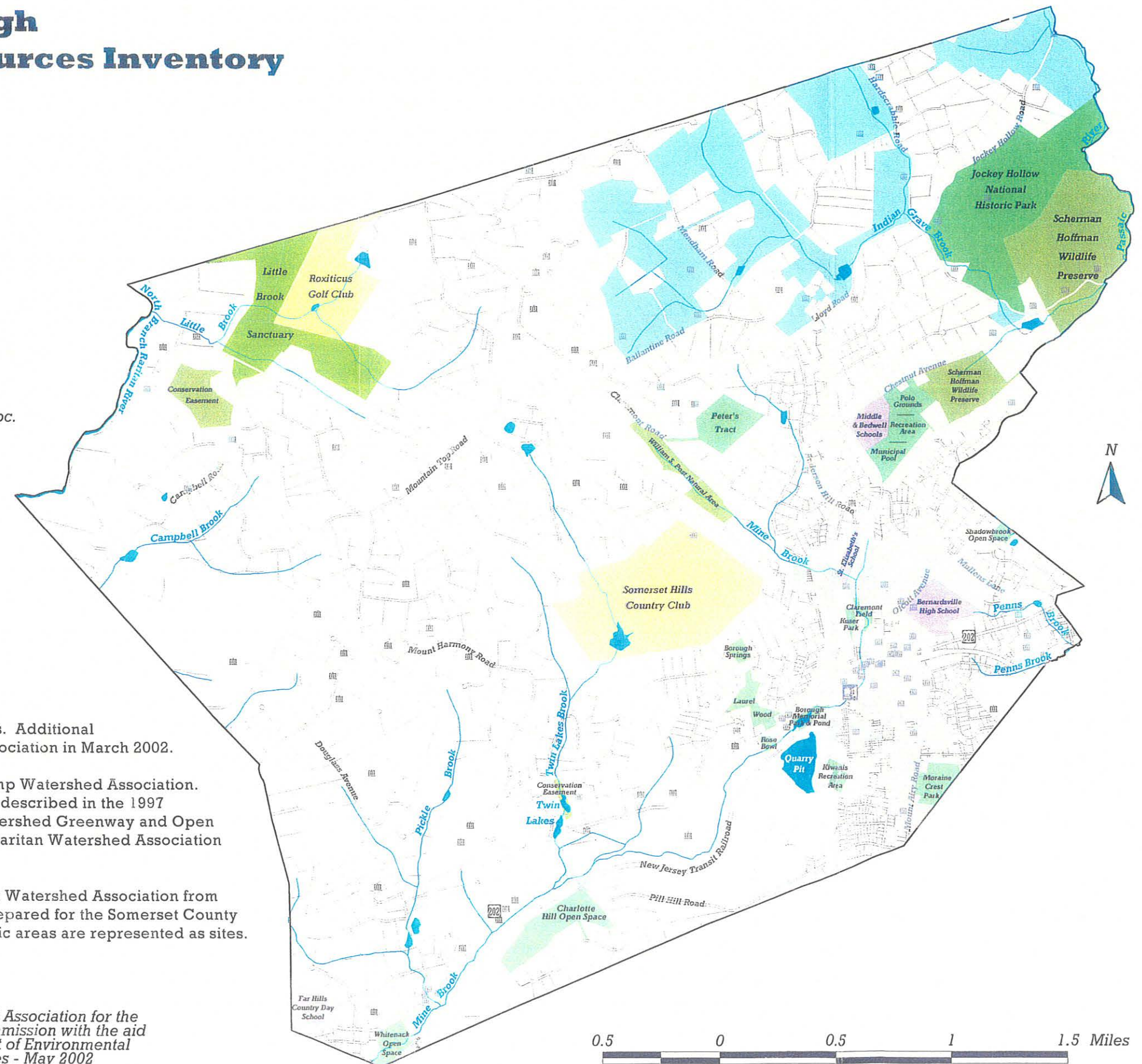
Open space data developed by Banisch Associates. Additional development by the Upper Raritan Watershed Association in March 2002.

Critical parcels data developed by the Great Swamp Watershed Association. The methodology for identifying critical parcels is described in the 1997 publication "Saving Space - The Great Swamp Watershed Greenway and Open Space Plan". Further development by the Upper Raritan Watershed Association in March 2002.

Historic sites data developed by the Upper Raritan Watershed Association from the Somerset County Cultural Resource Survey prepared for the Somerset County Cultural and Heritage Commission in 1989. Historic areas are represented as sites. All locations are approximate.



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Bernardsville Borough Environmental Resources Inventory

New Jersey State Plan Designated Town Center Boundary & Planning Areas

- Municipal Boundary
- Parcel Boundaries
- Rivers & Streams
- Lakes & Ponds
- State Plan Designated Town Center Boundary
- State Planning Areas
 - Suburban
 - Environmentally Sensitive
 - Federal Park

Designated Town Centers are traditional centers of commerce or government, with diverse residential neighborhoods served by a mixed-use core offering locally oriented goods and services. A key target of the State Plan is to promote and accomodate growth in Centers rather than sprawl across farmland and open spaces.

The Environs are the lands outside Centers, including farmland, greenbelts, open space and large forest tracts that are protected from inappropriate development. Policies for the Environs include protection through comprehensive planning, consistency between capital investment and regulatory strategies, preserving large contiguous areas, surrounding Centers with greenbelts and transferring density equitably from the Environs to Centers.

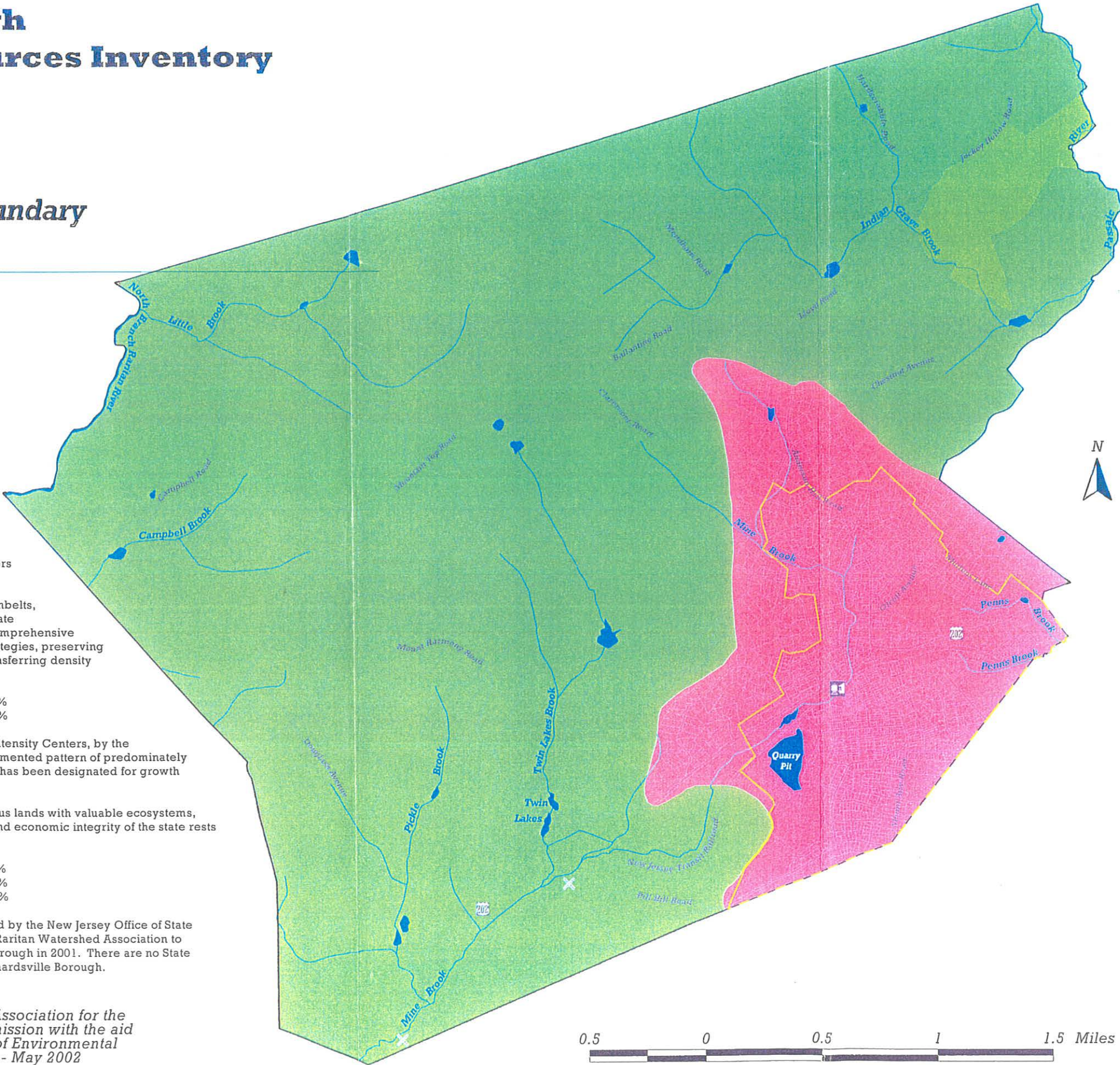
Designated Town Center	895.259 Acres	10.795%
Environs	7,397.911 Acres	89.205%

The Suburban Planning Area can be distinguished by a lack of high intensity Centers, by the availability of developable land and a moderately dispersed and fragmented pattern of predominately low-density development. It is served by regional infrastructure and has been designated for growth in municipal master plans.

The Environmentally Sensitive Planning Area contains large contiguous lands with valuable ecosystems, geological features and wildlife habitats. The future environmental and economic integrity of the state rests in the protection of these irreplaceable resources.

Suburban Planning Area	1,447.783 Acres	17.458%
Environmentally Sensitive Planning Area	6,663.087 Acres	80.344%
Federal Park	182.299 Acres	2.198%

State Planning Areas and Center Boundary GIS data were last updated by the New Jersey Office of State Planning in October 2000. They were further updated by the Upper Raritan Watershed Association to conform to municipal boundary GIS data created for Bernardsville Borough in 2001. There are no State Plan Critical Environmental Sites or Historic and Cultural Sites in Bernardsville Borough.



RECREATION PLAN ELEMENT

The Municipal Land Use Law guidelines for this plan element are:

A recreation plan element showing a comprehensive system of areas and public sites for recreation;

Much of the quality of Bernardsville is derived from its natural setting of open space, rolling and hilly terrain, parkland and recreation space. These natural resources, open space and recreation sites in the Borough in both private and public ownership are significant assets to the community.

There are a variety of recreation and open space lands and uses in Bernardsville. Each category is herein presented with recommendations for attention and enhancement. This first category is municipal recreation areas and is shown in the table below.

**TABLE 10:
MUNICIPAL RECREATION AREAS**

<u>Name</u>	<u>Acreage</u>	<u>Facilities</u>
Polo Grounds	27.7	Pool, athletic fields, woods
Rose Bowl	2.0	Ballfield
Claremont Field	3.2	Ballfields, playground
High School	15.0	Ballfields, multipurpose courts, gymnasium, all weather track
South Side Recreation Area	<u>2.7</u>	Ballfields, tot lot
Total	50.6	

Analysis of these existing municipal recreation areas shows they are very actively utilized. It is also noted that approximately 1/3 of the above total area is High School fields. This space is not always available as school use understandably has priority over organized local team sports use. The Polo Grounds is part recreation and part woods; with approximately 1/2 athletic fields.

Planning and professional recreation literature recommends the following for municipal recreation area:

<u>Type</u>	<u>Acres Per 1000 Population</u>	<u>Ideal Size Of Site</u>	<u>Minimum Size of Site</u>	<u>Radius Of Area Served</u>
Playgrounds	1.5 acres	4 acres	2 acres	0.5 miles
Neighborhood Parks	2.0	10	5	0.5
Playfields	1.5	15	10	1.5
Community Parks	<u>3.5</u>	100	40	2.0
Total	8.5			

Give the 1990 population of 6,597, the above figures generate a need for 56.1 acres. This information is "tempered" by local conditions. For example, it is recognized that the Borough is a suburban community wherein larger-lot homesites provide their own on-site individual private play equipment and recreation.

Combining all this information, plus recommendations from the Bernardsville Recreation Committee, there is a need for playfields to accommodate growing team sport participation. This need may be in part satisfied by expansion of the Polo Grounds. This area could accommodate, for example, a new little league field and tennis courts. There is also a need for more soccer fields. The need may also require additional areas for team sports and athletic fields.

Private Recreation Areas

There are two private golf courses in the Borough.

1. Somerset Hills Country Club containing 210 acres, and
2. Roxiticus Golf Club containing 77.3 acres in Bernardsville and the remainder in Mendham.

Currently, the Roxiticus Golf Club is wholly in the R-1 zone district, while part of the Somerset Hills Country Club is in the R-1 zone and part is in the R-1A zone. The two golf clubs are important golf, recreation and open space facilities in the community. This Plan recommends designation of the entirety of the Somerset Hills Country Club R-1. This recommendation recognizes the environmental characteristics of the property, abutting larger size lots and lack of any reason for the present split zoning.

Open Space

Although the differences between recreation, parkland and open space are blurred, open space

is essentially land or water, unimproved or improved for passive public use whereas, recreation, playfields and parkland are devoted to more formal and active public use. The following table presents municipal open space.

**TABLE 11:
MUNICIPAL OPEN SPACE AREAS**

<u>Name</u>	<u>Acreage</u>	<u>Facilities</u>
Borough Pond/Park	3.8	Sitting areas, pond, trail
Moraine Crest Park	16.1	Natural
Peters Tract	30.3	Natural
Borough (Whitenack Road)	15.3	Natural
Borough (Meeker Road)	34.3	Natural
Borough (Laurelwood Drive)	12.2	Natural
Borough (Pine Hill Road)	11.4	Natural
Borough (Route 202)	2.6	Vacant
Borough (Borough Springs)	4.0	Natural
Borough (Pill Hill Road)	4.1	Composting
Kuser Park	<u>2.4</u>	Natural
Total	136.5	

These areas are scattered throughout the Borough and add an open space ambiance to their respective neighborhoods. Several have been acquired as dedicated open space in concert with subdivision of land for housing.

County And Federal Open Space

Both Somerset County and the Federal Government have significant open space areas in the Borough.

**TABLE 12:
SOMERSET COUNTY AND FEDERAL OPEN SPACE**

<u>Name</u>	<u>Acreage</u>	<u>Facilities</u>
Somerset County Park		
Commission	98.7	Natural
Jockey Hollow National		
Historic Park	<u>191.3</u>	Natural, trails
Total	290.0	

Lastly, there is a scattering of private open space areas in the Borough as shown in the table below.

**TABLE 13:
PRIVATE OPEN SPACE**

<u>Name</u>	<u>Acreage</u>	<u>Facilities</u>
Scherman Wildlife Preserve		
Audubon Society	189.5	Woods, trails
Upper Raritan Watershed Association	16.3	Natural stream corridor
NJ Conservation Foundation	2.7	Ponds and scenic easement
Casperson (Campbell Road)	24.0	Open space easement
Fenwick (Mendham Road)	18.0	Open space easement
Paragano (Mendham Road)	<u>3.5</u>	Conservation easement
Total	254.0	

The largest private open space area is the Scherman Wildlife Preserve Audubon Society property in the northeast corner of the Borough. This property together with the Jockey Hollow Historic National Park form a substantial open space area of 380.8 acres.

In an effort to evaluate the quantity and quality of recreation and open space in a municipality, several standards have been promulgated.

- a. The New Jersey Department of Environmental Protection (DEP) recommends three percent of a municipality's land area be devoted to public recreation and open space. Accordingly, Bernardsville requires 251.5 acres ($8,384 \text{ acres} \times 0.03 = 251.5 \text{ acres}$). This compares to a total of:

Municipal open space	136.5 ac.
Municipal recreation	<u>53.3 ac.</u>
Total	189.8 ac.

The above public figure of 189.8 acres is less than the above 3% recommendation.

- b. The New Jersey Council On Affordable Housing (COAH) allows a municipality to reserve six percent of a municipality's land area for recreation and open space.

Accordingly, Bernardsville can allocate 503.0 acres ($8,384 \text{ acres} \times 0.06 = 503.0 \text{ acres}$). This 503.0 figure is substantially above the 224.1 figure of existing recreation and open space.

In comparing the above standards to available open space, the analysis did not include county or federal land. Including these lands would satisfy the NJ DEP 3% standard but still fall below the level permitted by COAH.

Private open space and golf club lands are typically not included in this analysis. While they are valuable assets to the community, they are restricted in use and access.

These standards are meant to be guidelines and not dictates. Indeed, the community most recently voted on this very issue. Borough residents voted to tax themselves to provide funds for additional open space. Thus, the citizenry wants more publicly owned or controlled open space. Consistent with this mandate, the following objectives are recommended.

1. Encourage cluster subdivision to obtain neighborhood open space. Clustering is presently allowed in the ordinance.
2. Encourage open space easements and dedications of conservation areas from private property holdings.
3. Encourage private environmentally-oriented non-profit organizations to acquire open space acreage. Particularly important is the acquisition of stream corridors and lands immediately abutting these corridors.
4. Utilize the newly adopted Open Space Tax resources to acquire open space to preserve environmentally critical lands, stream corridors and needed parkland and playfields.
5. Utilize funding from a variety of sources: farmland preservation, green acres, county and open space tax resources to acquire lands and/or development rights to farmland, and roadway vista corridors.
6. Utilize Open Space Tax resources to acquire through fee simple or easements a pedestrian pathway which links open space and parkland throughout the Borough. Specifically, this pedestrian linkage will connect: Jockey Hollow, Audubon, Evankow/Weller, Polo Grounds, Claremont Field/Kuser Park, Borough Pond/-Building and Rose Bowl.
7. Encourage N.J. Conservation Association and Upper Raritan Watershed Association to extend their stream corridor lands.
8. Explore opportunities for "greening" the Town Center "downtown". This can include

creating, for example, vest-pocket parks, streetscape landscaping and sidewalk planters.

9. Determine the appropriate passive use for the Peters Tract and Moraine Crest, currently in natural wooded states with limited public access.

LAND USE PLAN ELEMENT

The Municipal Land Use Law requires the land use plan element to be:

"A land use plan element taking into account and stating its relationship to.... and other master plan elements.... natural conditions, including, but not necessarily limited to, topography, soil conditions; water supply, drainage, flood plain areas, marshes, and woodlands, and showing the existing and proposed location, extent and intensity of development of land to be used in the future for varying types of residential, commercial, industrial, agricultural, recreational, educational and other public and private purposes or combination of purposes; and stating the relationship thereof to the existing and any proposed zone plan and any proposed zone plan and zoning ordinance;.... including a statement of the standards of population density and development intensity recommended for the municipality:"

The Land Use Plan Element is designed to implement the goals and objectives of the Master Plan in map and text form and is a synthesis of the other elements that make up the plan. The Land Use Element designates different geographic areas of Bernardsville for a spectrum of land uses based on the existing development pattern, market trends, the policy objectives for land development and redevelopment in the Borough environmental characteristics, infrastructure and related factors. This element provides both a policy and legal foundation for the zoning or land development ordinance. The Land Use Plan delineates area boundaries for the land use classifications and forms the basis for the zoning map.

Large scale changes are not contemplated. Land use regulation has grown more complex since the adoption of the previous Master Plan in response to changing real estate markets, new housing products, increasing environmental awareness, new policy objectives and regulation imposed by other levels of government, and continuing judicial interpretation of the laws governing land use.

The Land Use Plan Element must also be responsive to changes in the state of the art of planning as new techniques are proposed, examined, and adopted. The intent is to create an implementation document that will be used regularly to review and assess development and redevelopment proposals while promoting the goals and objectives of this Master Plan.

The general land use pattern that characterizes the Borough is relatively straight forward. At the center is the built-up commercial and mixed land uses. Surrounding this core is the highest density housing. As the distance from the core increases so does the size of residential home sites until finally one reaches the lowest density area or district, locally referred to as the Mine Mountain area or the R-1 zone district.

The previously adopted 1979 Land Use Plan classified land in the Borough into eight broad land use categories. These included: residential low density, residential medium density, residential high density, commercial, industrial, public and semi-public, park and public open space and open space (privately owned). The Plan also presented analysis, discussion and recommendation for the traditional seven sectors in Bernardsville: Mine Mountain, Park, Bedwell, Mt. Harmony, Olcott, Pill Hill and Mt. Airy. Similarly, this Master Plan makes reference to these categories and sectors. However, as the municipal land use law now requires that a "zoning ordinance be substantially consistent with the land use plan element and the housing plan element of the master plan..." it has become necessary to present the land use plan with greater specificity than had been done in the past. Thus, this land use plan is presented on a zone district format. There are currently 15 zone districts in the Borough. Each is discussed herein and recommendations are offered.

R-1 Residence District

This district is the largest in the Borough containing 5569 acres or 66.4 percent of the total 8384 Borough acres. There are four distinct land uses within this district: two golf club/courses, parkland, single family homes and estates containing heritage homes.

This district, also locally known as the Mine Mountain neighborhood or area, contains the more rugged topography in the Borough.

Since the 1979 Master Plan, this district has witnessed extensive single-family development as larger estate properties are subdivided into five-acre lots. This trend continues and is now proceeding on land characterized by critical environmental factors: i.e. steep slopes, wetlands and wetland transition areas. Small streams meander through the district. Many roadways are narrow. While contributing to the rural character these roadways have limited capacity. They also suffer from poor drainage and poor alignment.

In general, the less constrained properties in the R-1 district have been subdivided and developed. The remaining subdividable land is more constrained. Consequently, while new lots may have the required five acres, the presence of steep slopes, floodplain, wetlands and wetland transition areas diminish the utility of the lot. At present, the ordinance requires the building envelope to be free of riparian land, wetlands and wetland buffer areas.

In consideration of the above findings, it is recommended that the building envelope exclude flood plain and steep slopes. Essentially, the building envelope or lot shape should be relatively free of all critical environmental factors. In some cases, a new lot may require more than five acres to satisfy this requirement.

There are mansions, estates and heritage properties still remaining in this R-1 zone district. Development pressures are absorbing these properties. One means, currently in the ordinance, to

preserve these properties is the "estate mansion conditional use." This concept permits for example, "a conference or management training center" in the district on a minimum of 20 acres. Other uses under this concept are also permitted: "a religious retreat," "private school," etc. Upon analysis however, it is determined that some of these uses would introduce significant new traffic on winding, mountainous roads and greatly increase the population density at certain periods in a basically low density area. Some of the uses are undefined and thereby open to unanticipated use and scale of use. It is recommended that the "estate mansion conditional use" be eliminated.

The goals of this concept however, may in certain situations continue to be valid. They are in summary: to preserve and perpetuate estate mansions and heritage properties, promote the preservation of open space, and allow for these unique uses at a very low density scale. Thus, it is appropriate to incorporate these objectives into this Land Use Plan Element, yet, evaluate their implementation on a case-by-case basis. Valid implementation uses may include readaptive reuse, school use, museum, arboretum or horticulture gardens, public use or even very low density housing use.

Examination of the western portion of this R-1 zone shows several unique characteristics. It is severely constrained by steep slopes. It is served by narrow winding roads. It is distant from emergency services. The majority of the area still contains larger sized lots. The water shed for this area drains into the North Branch of the Raritan River, a trout production river. It borders Far Hills Borough and their Low Density Residential zone wherein the minimum lot size is 10 acres.

The eastern portion of the Borough is characterized by extensive open space land, both public and semi-private and larger lot properties. The watershed in this area drain into the Passaic River and Indian Grave Brook, both trout production streams. The area is also characterized by steep slopes. Local roads are narrow and winding. It is distance from emergency services.

Similar characteristics are exhibited in the northern tier area of the Borough; the area bordering the Mendhams. Given these unique characteristics and in particular the rugged terrain and drainage patterns, it is recommended that the minimum lot size for a single-family home in these areas become 10 acres.

Except for the areas discussed above, the remainder of the R-1 zone district is already 50 percent or more developed. However, given the current concerns about the drawdown of underlying aquifers by private wells and the ability of some types of soil to support individual septic systems while avoiding contamination of ground water, it appears that most of the 5 acre zone should have been originally zoned approximately 10 acres. Larger sized lots would also have accommodated severe State restrictions on wetlands and transition areas which limit utility of property.

Hence, elsewhere in the R-1 district the existing low density zoning, i.e., one residence on 218,750 square feet, or five acres should be maintained. This density is long established and is based

upon the road limitations, lack of utilities, environmental constraints and preservation of open space and heritage properties.

It is inappropriate for on-site accessory housing once used in the past for domestic and/or caretaker residence on estates to be converted to year-round rental housing. Use for on-site help or as a guest cottage use may be an appropriate readaptive reuse in certain properties.

R-1A Residence District

This district is located west of the downtown and in the 1979 Master-Plan was referred to as the Pill Hill and Mt. Harmony sectors. This district is characterized by three major land uses: a portion of the Somerset Hills Country Club, the Ruschman property containing agricultural use and a factory, and single family homes on 137,500 square foot (3 acres) home sites. This area is not served by public water and sewer. This R-1A area contains 840 acres. The majority of this acreage is Ruschman and Country Club properties.

The Ruschman property presents several unique assets to the Borough and County. First, it is a large tract (containing several lots) that is used predominately agriculturally. It is the largest tract with development potential in the Borough. It's view from Mine Brook Road (Route 202) is visually stunning, showing grazing cattle, treed knolls, a meandering stream which has periodically flooded and a unique open space/agricultural vista. The property is a prime candidate for farmland preservation and qualifies as a Somerset County scenic corridor. While there are additional properties also along Route 202 and in isolated locations throughout the Borough that have similar characteristics none compare to the Ruschman property in scale, scenic beauty and importance to the Borough.

The Somerset Hills Country Club is divided into two zone districts. Approximately 40 percent is in the R-1A zone and 60 percent is in the R-1 zone. It is the second-largest developable tract in the Borough. Examination of prior Master Plans and zoning shows there is no reason offered in these documents for the split zoning of the property. Similarly, examination of the tract's physical characteristics show few differences between the two districts which would warrant this zoning split.

It is recommended that the entirety of the Country Club property be placed in the R-1 zone. This rezoning places both golf courses in the Borough in the same zone district.

Examination of recent subdivisions in the R-1A zone district show that the one on Charlotte Hill was a cluster subdivision. The Borough obtained a large open space parcel as a result of the cluster approach. Other recent subdivisions, Round Top Road and Rippling Brook Way also in the R-1A district, were conventional subdivisions but should have been cluster subdivisions. Cluster subdivisions in other parts of the Borough, Laurelwood Drive and Laurel Lane for example, have proven to be the better alternative to conventional subdivision. Presently, cluster subdivision is an option.

The recommendation is that all major subdivisions in the R-1A zone district be cluster subdivisions. This objective maintains reasonable development for the property yet, affords the community the opportunity to preserve open space, vistas and environmentally sensitive land.

R-2 Residence District

This district is the transition district between the low density R-1 (Mine Mountain) district and higher density closer to the downtown. The R-2 district also characterizes an area fronting Route 202 at the western area of the Borough from Mt. Harmony Road to the border with Far Hills. The minimum lot size is 50,000 square feet. Most of this district is developed for single-family housing. The western R-2 area along Route 202 is characterized by several commercial nursery uses of questionable legality. The R-2 zones aggregate to 632 acres.

Portions of the R-2 zone district are served by public water and sewer while other areas depend upon individual on-site septic systems. The low density of development in this zone coupled with the enormous expense of pumping the effluent up Route 202 to the existing sewage plant has prevented the Borough from planning to extend sewer service to the western R-2 zone.

The western R-2 zone along Route 202 is an important part of that Route 202 scenic corridor. The overwhelming number of land uses fronting Route 202 are single family homes as permitted in this zone. Several nursery uses, while also in this portion of the R-2 zone, are presently not permitted uses in the R-2 zone. Nor, should any other properties along this corridor be used for other than residential use.

This Plan recommends no expansion of non-residential uses in this district and assumes that in time non-residential uses will be converted to permitted residential use.

R-3

This zone district is characterized by single family home sites of 20,000 square feet. It is found to the north and southeast of the Borough downtown. This R-3 district is served by both public water and sewers. With the exception of a few isolated vacant lots, there are no vacant parcels in this district. Thus, it is anticipated that no land use or density changes will occur in this district and it will continue as a single-family district at the permitted R-3 density.

R-4 and R-5 Districts

These two zone districts are the densest single-family zones in the Borough: 11,250 square feet and 5,000 square feet lots are required. Both zones are served by public water and sewers.

At one time, two-family housing was permitted in these districts. However, in the 1970's two-family was eliminated as a permitted use. Thus, there are some two-family homes scattered

throughout these districts. Upon review, however, the Borough should maintain the current housing/land use policy of only permitting single-family homes in these two districts. This policy serves to stabilize the zones and prevent conversion to multifamily.

R-8 Attached Residence District

This one small district accommodates townhouse use. The district fronts Route 202. There are no changes or modifications recommended in this Plan for this zone district.

R-10A Multifamily Housing District

This zone fronts Finley Avenue at the eastern end of the Borough. It was recently rezoned to R-10A as an inclusionary housing zone. There are 41 units in this zone district of which 15 are multifamily for low- and moderate- income households and 26 are market single-family detached homes. There are no changes or modifications recommended in this Plan for this zone.

R-10B Multifamily Housing District

This zone fronts Pine Street and is exclusively an inclusionary housing zone for low- and moderate- income households. It is developed for 26 housing units. There are no changes or modifications recommended in this Plan for this zone.

OB Office Building District

At the eastern end of the Borough is a small office building district fronting Route 202. This zone is developed for office building use. There are no changes or modification recommended in this Plan for this zone.

HD Highway Development

This zone district describes the one shopping center in Bernardsville. It fronts Route 202 and contains Kings Supermarket, Burger King and satellite retail shops and stores.

The main issue with this zone is traffic congestion with entering and exiting traffic conflicting with through traffic on Route 202. This conflict is particularly noticeable during the evening peak commutation period and on Saturday during the peak shopping period. Contributing to the conflicting traffic movements are the multiple curb cuts servicing the commercial users immediately across Route 202. Sufficiency of parking is also an issue in this district.

Recently, the State Department of Transportation repaved this section of Route 202 and also installed sidewalks and street landscaping. These improvements helped define the roadway but congestion still persists at peak times.

There are no changes to this zone district proposed in this plan at this time. However, the zone and in general this stretch of Route 202 suffers from traffic congestion as described above. Any development and/or redevelopment in this zone and/or along this stretch of roadway must be evaluated as to its impact upon traffic.

This Plan also recommends continued aesthetic and site plan improvements to this shopping corridor. Landscaping the interior portions of the large parking lot in the Bernardsville Plaza for example, assuming it does not absorb too much parking, represents a needed improvement. Additional "greening" of this retail corridor is recommended.

C-1 Commercial District

This zone district fronts Route 202 and is located on the eastern and western sides of the downtown. The eastern district extends out to the border with Bernards Township. The western district extends out to the pond and municipal building.

Land and property in this district is built-up with little opportunity for new development. Redevelopment, that is the upgrading and/or expansion of commercial uses is expected and has been occurring on an individual- property basis. To insure that redevelopment also promotes Borough objectives it is recommended that these activities include improvements to facades, signs, landscaping, ingress/egress, pedestrian access and parking. Traffic generation is an important concern. Expansion and redevelopment incorporating these improvements can be appropriate to the district and an enhancement to the Borough.

It is recommended that in the eastern portion of the C-1, the zone district boundary between C-1 and R-3 be adjusted to conform to existing land uses.

B-1 Business District

The core of commercial uses in the Borough is found in the downtown B-1 zone. This district historically has provided shops and stores for the area. Coupled with the HD and C-1, These zones provide a wide variety of commercial uses to serve the region.

The B-1 zone is distinct from the other two commercial zones in that it contains mixed commercial/residential uses, the commuter train station and movie theater are all found near or around the major and busiest intersection in the Borough. Thus, this district has its own particular land use-circulation-parking-housing-redevelopment issues to grapple with. In addition, this downtown area is in need of aesthetic rejuvenation if it is to continue to serve as a prime commercial center for the region.

The Bernardsville downtown is an asset to the Borough. It is a rateable, provides sales and services needs, provides a livelihood for those employed and is a strong visual element in the Borough

which contributes to defining the Borough's image. Recently, there have been individual property redevelopments and upgrading which are providing exemplary illustrations of the potential for all of the downtown.

The route taken by many "older" downtowns in New Jersey is to collectively prepare a plan for the revitalization of their downtown. This revitalization plan of necessity requires the cooperation of all interested parties: private and public. Such a program is recommended for the Bernardsville downtown in this Master Plan.

Several of the major planning and zoning issues characteristic to the downtown which can be addressed in such a Plan are as follows:

- Traffic circulation: truck traffic in the downtown conflicts with shopper traffic and through traffic.
- Parking: demand for parking is high as commuters, shoppers and residents compete for a limited number of parking spaces.
- Mixed land uses: it is generally assumed that the downtown can accommodate certain limited types of residential use: apartments above stores for example. However, issues of appropriate density and adequate parking are outstanding.
- Physical enhancement: there is much that can be accomplished by both private and private/public partnership to improve the attractiveness of the downtown. This may include, new store facades, new canopies, street furniture, landscaping, pattern sidewalks and period street lamps.

I Industrial

There is one I Industrial district in Bernardsville. This property was historically used as a quarry and while the quarry use has been terminated there are still an operating concrete/asphalt plants on the property. A consequence of this use is extensive truck traffic through the Town Center.

As this property is characterized by zero depth to bedrock and is not served by public sewers, nor will it be so served, the uses appropriate to this unique property are limited. These include those uses which do not generate employees or need sewer facilities. Appropriate uses include storage and warehouse uses, for example. Uses which generate truck traffic are not appropriate.

It is recommended that the permitted uses in this zone be reexamined and certain permitted uses no longer appropriate to the district be eliminated to insure the concepts expressed above and Borough goals and objectives are implemented.

I-2 Light Industrial Zone

This zone district was recently enacted to reflect the particular type of uses in this district. They are long established light manufacturing and craftsman shop uses. Access is via Bernards Avenue. The small size of this district and unique uses presently in this district, do not generate traffic incompatible to the local streets which provide access. Uses which have significant truck, employee or customer traffic are not appropriate for this zone. No changes or modifications are recommended in this Plan.

Bernardsville Downtown Plan

The Bernardsville downtown may be viewed as three areas from west to east along Route 202. The westernmost or Borough Pond area extends from an athletic field and Borough Hall eastward past the pond and through a mixture of business and residential uses to the railroad station. The central or Olcott Square section continues eastward along Route 202 through the intersections of Anderson Hill Road and Mount Airy Road with Route 202 at the Olcott Square traffic circle to Church Street. This section has a one-block deep commercial area north of Route 202 including Mill Street, Quimby Lane and the new library. The section also extends northward from the station along Claremont Road several blocks in an attractive mix of business and residential uses. The third is a strip-type commercial development, known locally as "the Shopping Centers", on either side of Route 202 eastward to the municipal boundary.

The three areas in concert function as both a local and a regional center for shopping and business needs. By offering essential goods and services at locations convenient to borough residents, they contribute importantly to the desirability of Bernardsville as a residential community.

In addition to addressing these commercial needs, the downtown serves multiple functions to the community. These include:

- Commuting from the railroad station to employment centers to the east,
- Reverse commuting to employment in the downtown area from eastern urban areas,
- Intersection of major collector roadways for traffic going into and through the Borough,
- Civic and educational uses including the Borough Hall, new library, park, high school and post office,
- Offices offering banking, medical, legal and realty services, among others,
- Cultural and recreation uses including the library, athletic field, a movie theater and a passive recreation park,
- Residential uses in the form of apartments above shops and stores and single and two-family homes immediately abutting the downtown,
- Public and private parking, and
- A variety of restaurants and a movie theater.

In addition to the above tangible uses, the downtown also functions as part of the image of

Bernardsville. That is, the streetscape and the architecture and types of stores and shops collectively contribute to a positive or negative perception of the downtown and borough by both residents and those considering living or shopping in the borough.

Lastly, the downtown is part of the economic base of Bernardsville. It is estimated that about 1800 covered employment jobs are in the downtown. Commercial rateables represent the second highest assessed value of property in the Borough; the first being residential.

Downtown Issues

It is important for the downtown to serve the needs of area residents. They must be able to shop in an agreeable and safe atmosphere for varied goods and services. A healthy downtown provides important tax revenue and increases the value of residential properties.

Two conflicts adversely impact the downtown's ability to serve this mission; traffic and the competition of much larger shopping entities:

The traffic conflict is between the need to allow safe foot traffic, with amenities such as trees, benches and pedestrian walkways, throughout the downtown and especially across Route 202, and to provide convenient parking, and the need to expedite the flow of trucks and other traffic along Route 202 and through the downtown. While both needs must be satisfied, it is important that an agreeable shopping atmosphere is not sacrificed to the demands of transient traffic.

The conflict with larger entities arises because the small businesses in the downtown area must compete both with catalog and Internet retailers of vast resources and with area malls. The Internet offers almost unlimited selections; the malls have stores offering a wider range of goods than most local businesses can stock.

The eventual impact of catalogs and the Internet cannot be predicted, but more personal service will doubtless remain an advantage of local stores.

One strength of malls is that they are supported by marketing and need studies which assist new tenants. In contrast, stores proposing to locate in Bernardsville are largely bereft of information about customer desires and market statistics, and many fail through lack of understanding of the local retail environment. Both existing and prospective businesses need assistance to understand the niches available so they can exploit them for their success and the benefit of shoppers in the Bernardsville market.

Some communities have chosen to address these conflicts by creating a Special Improvement District to provide the coordinated management and advice that a mall office routinely provides to its tenants and prospective tenants. This Master Plan document recognizes the issues, importance and opportunities of the downtown and encourages arriving at a solution through the cooperation of the citizens, businesses and the governing body.

Downtown Needs And Opportunities

The following review of the Bernardsville downtown area records an imaginary walk from west to east. Along this path comments are made regarding major assets and liabilities.

The Borough Hall constitutes a natural starting point at the western end of the downtown. This historic civic building is flanked on either side by an athletic field and a park featuring a pond. The Downtown Plan envisions providing a pedestrian link to the Olcott Center from the Borough Hall as well as throughout the Borough connecting public space, parks, schools and fields along the route.

The next major land use is the railroad station and accessory commuter parking. This important gateway site and historic building is largely devoid of amenities such as landscaping which could enhance the site's appearance. A mini-park at the eastern end of the site and strip landscaping at the western end are small examples of amenities which if expanded could transform this plain site into a visually attractive area.

Walking along Quimby Lane reveals mixed land uses predominantly auto related but also including parking, rear facades of buildings, post office and offices. These uses, while providing certain commercial services, under-utilize their properties and present an unappealing streetscape. Particularly unattractive is front yard pavement and parking and lack of streetscape amenities such as landscaping.

A similar streetscape observation pertains to Mill Street which is dominated by a large vacant parcel.

Continuing east on either side of Mine Brook Road are a series of boutique-style shops and stores. Many are served by fragmented parking accessed through the cluttered rear doors of the shops from Quimby Lane. Their attractiveness and safety of access would be enhanced by connecting public and private parking and providing direct pedestrian access from the interior parking off Quimby Lane to the Mine Brook Road sidewalk.

The intersection of Mount Airy Road and Mine Brook Road, Olcott Square is tight. Trucks have difficulty maneuvering turns at this intersection and there are frequent delays at the traffic signal. This congestion tends to repel pedestrian movement in this area.

The Olcott Square area is at the heart of the Bernardsville downtown. Shops, stores and offices fronting this square enjoy a highly visible, prominent location. Similarly, the shops and stores fronting Morristown Road in this area also benefit from their visible, prominent location. Parking has been a problem in the area but the parking lot at the new library may alleviate the shortage of spaces. There are numerous examples of individual property rehabilitation and enhancement which clearly demonstrate aesthetic improvement possibilities.

Other establishments while well positioned in the downtown lack improvements in building facades and the streetscape that could make a dramatic difference in the physical appearance of this

Square area.

The eastern area of the downtown is characterized by strip-type commercial development. Recently, the NJDOT made major improvements to the street pavement, installed new sidewalks and street trees. The Bernardsville Plaza shopping center recently installed shade trees in its lot and installed new signs, building facades and roof treatments. These changes are a significant improvement over the previous appearance of this shopping center. These improvements are also a solid beginning to transforming this strip commercial area to an image more appropriate to a suburban or rural setting than the highway image of its past.

In summary, the Downtown Plan chapter to the land use plan element proposes the following.

Recommendations

1. Encourage private building facade enhancement which can include for example, new facades, new color-coordinated signage and new canopies.
2. Coordination of public and private parking areas to increase shopper parking by connecting parking areas and provide pedestrian accessways to both the front and rear of stores and to sidewalks.
3. Promotion of the greening of the downtown by introducing mini-parks at strategically located visible sites. Provide a pedestrian greenway from the Borough Hall through the downtown and ultimately to connect to Jockey Hollow Park.
4. Study of the Mill Street/Quimby Lane area with the aim of improving the streetscape, connecting parking areas and introducing new land uses.
5. Encourage the NJDOT to enhance the railroad station building and parking area. Streetscape improvements in front of the station property are also needed.
6. Requiring screening of all front yard parking areas.
7. Coordination of the recommendations herein with the land use plan element.
8. Seeking of State funding for downtown improvement grants including enhancement of the railroad station neighborhood and reduction of traffic congestion.

9. Develop a downtown center vision plan, based upon the coordinated vision of merchants, land owners, government and citizens.

HOUSING PLAN ELEMENT

The Municipal Land Use Law requires:

"A housing plan element pursuant to N.J.S.A. 51:27D-310 (Fair Housing Act of 1985)....including but not limited to, residential standards and proposals for construction and improvement of housing...."

Essentially, a municipal housing plan element is required to identify the housing characteristics of the Borough and address the fair share housing need for low- and moderate- income households as determined by the New Jersey Council On Affordable Housing ("COAH").

To address this need, the Borough adopted in 1995 a Housing Plan Element and Fair Share Plan. Based upon this Plan, COAH granted substantive certification to the Borough. This means the low- and moderate- income household housing need is satisfied.

The need period is to the year 1999 and the Plan proposed and COAH accepted the following Fair Share Plan:

-	Rehabilitation	41 units
-	Regional Contribution Agreement	43 units
-	Two family home	2 units

COAH is in the process of preparing new housing need figures for all New Jersey municipalities for the year 2000 and beyond. Once these numbers are published, Bernardsville will be required to prepare a third housing plan element and fair share plan. At the present time, Bernardsville is in compliance with all Fair Housing Act and COAH requirements.

Policy Statement Relative To Master Plans Of Contiguous Municipalities

The Bernardsville Master Plan is required to contain a specific policy statement indicating the relationship of the proposed development of the municipality as developed in this Master Plan to:

1. The Master Plan of contiguous municipalities,
2. The Master Plan of Somerset County, and
3. The State Development and Redevelopment Plan.

1. Contiguous Municipalities

- a. Harding Township designates contiguous land as R-1, one home on 3 acres. This designation is compatible with the R-1 (5 acre) designation in Bernardsville. Much of this area in Bernardsville is parkland and conservation land.
- b. Mendham Township borders the Borough in two distinct locations. The eastern location is R-5, one home on 5 acres. This is compatible with the R-1 (5 acre) designation in Bernardsville in the Jockey Hollow Road area.

The second location is in the Stevens Lane area of the Borough. Again the designation in Mendham Township is R-5, one home on 5 acres. This is compatible with the R-1 (5 acre) designation in Bernardsville.

- c. Mendham Borough designates its contiguous area 5 Acre Residential for single family homesites. This designation is compatible with R-1 (5 acre) designation in the Borough in the Mendham Road/Chapin Road area.
- d. Peapack And Gladstone Borough designates its contiguous area R-E, one home on 5 acres. This designation is compatible with the R-1 (5 acre) designation along the South Branch of the Raritan River in Bernardsville.
- e. Far Hills Borough designates its contiguous area R-10 north of Route 202 and R-6 south of Route 202 . The R-10 designation translate into one home on 10 acres. This is compatible with the R-1 (5 acre) designation at the western sector of the Borough.

There is a small area designated R-6 or one homesite on 5 acres between Route 202 and the railroad. This designation is compatible with the R-1 (5 acre)

designation in Bernardsville.

f. Bernards Township shows the following designations:

- R-1 (3 acre) next to the R-1A (3 acre) designation in the Meeker Road area of Bernardsville. These designations are compatible.
- P-1 Public Purpose is opposite the R-1A designation opposite Pill Hill Road in the Borough. This designation coupled with use as a leaf storage/refuse area is incompatible with the R-1A (3 acre) designation in Bernardsville.
- R-4 (40,000 s.f.) in Bernards Township is next to R-2 (50,000 s.f.) in Bernardsville. They are compatible designations in the Pill Hill Road area.
- R-7 (20,000 s.f.) in Bernards Township is next to R-3 (20,000 s.f.) in Bernardsville. They are compatible designations in the Mount Airy/-Washington Ave. Area.
- R-6 (30,000 s.f.) in Bernards Township is next to R-3 (20,000 s.f.) in Bernardsville. They are compatible designations in the Finley Ave./Tysley St. area.
- R-4 (40,000 s.f.) in Bernards Township is next to R-2 (50,000 s.f.) in Bernardsville. They are compatible designations in the Childs Road area.
- R-1 (3 acres) designation in Bernards Township is next to R-2 and R-1 in the Old Army Road areas of Bernardsville. They are compatible designations in the Old Army Road area.

2. The State Development and Redevelopment Plan shows three planning area designations for Bernardsville.

- a. Town Center (TN) - The State Plan identifies a Town Center as "a traditional, compact, mixed-use core of development providing all of the commercial, industrial, office, cultural and governmental functions commonly needed on a daily basis by the residents of the Town and its economic region; it has neighborhoods providing a mix of residential housing types, with infrastructure serving both the core and the neighborhoods...." (page 95)

On April 28, 1999, the State Planning Commission granted Town Center designation to Bernardsville. This designation established the boundaries for the Town Center, involves the Borough in the State planning process and gives

Bernardsville priority status with all State agencies and offices.

- b. Suburban Planning Area (PA2) - The State Plan identifies PA2 as "located adjacent to the more densely developed Metropolitan Planning Area, but can be distinguished from it by a lack of high intensity Centers and by the availability of vacant developable land. The Suburban Planning Area is or will be served by urban infrastructure, except that there is limited, if any, availability of alternative modes of transportation to the automobile. The Area has generally been designated for growth in municipal master plans. As development expands to the Area's boundary, these services will become increasingly available if planned properly". (page 105)

This designation by the State Plan is not compatible with the Bernardsville Master Plan nor zoning for this area. First, the area in Bernardsville shown as PA2 is fully developed with very little, if any growth potential. Second, the vast majority of this area is not and will not be served by public sewers. As a consequence, contrary to the State Plan, future growth is not planned to be accommodated in this area of the Borough. Rather, this area has already reached its growth limit. Planning for this area should address needs for open space, recreation space, reduction in traffic and improvements in pedestrian circulation. The extensive single family housing character of this area will remain.

- c. Environmentally Sensitive Planning Area (PA5). The State designates most of Bernardsville as PA5. "The Environmentally Sensitive Planning Area has large contiguous land areas with valuable ecosystems and wildlife habitats. These lands have remained somewhat undeveloped or rural in character. They are characterized by watersheds of pristine waters, trout streams and drinking water supply reservoirs; recharge areas for potable water aquifers; habitats of endangered or threatened plant or animal species; coastal and freshwater wetlands; prime forested areas; scenic natural landscapes; and other significant topographical, geological or ecological features. These resources are critically important not only for the residents of the Planning Area, but for all New Jersey citizens. The future environmental and economic integrity of the State rests in the protection of these irreplaceable resources." (page 114)

This PA5 designation is compatible with the Master Plan policies for this area.

3. Somerset County Master Plan - 1987

This planning document is divided into two sections, background and the plan. The background section is an inventory of land use trends, circulation system, natural resources, utilities and services and lastly population and economic trends.

The plan section presents goals and recommendations in major areas such as land use, circulation, etc. For example, the land use plan for Bernardsville identifies the Borough downtown as a "community settlement", the Route 202 corridor area as "growth management" and the remainder as "rural preservation". The far northwestern and far northeastern areas of the Borough are also "growth management".

These general county master plan concepts are consistent with Bernardsville land use plan element.

The circulation system plan shows the intersection of Routes 202 and 525 as a "major problem intersection".

It is recognized that the 1987 County Master Plan is seriously out-of-date. Master Plans should be reexamined every six years. The County is in the process of preparing a Master Plan reexamination.

Somerset County - Master Plan Reexamination Report - 1998 (Draft)

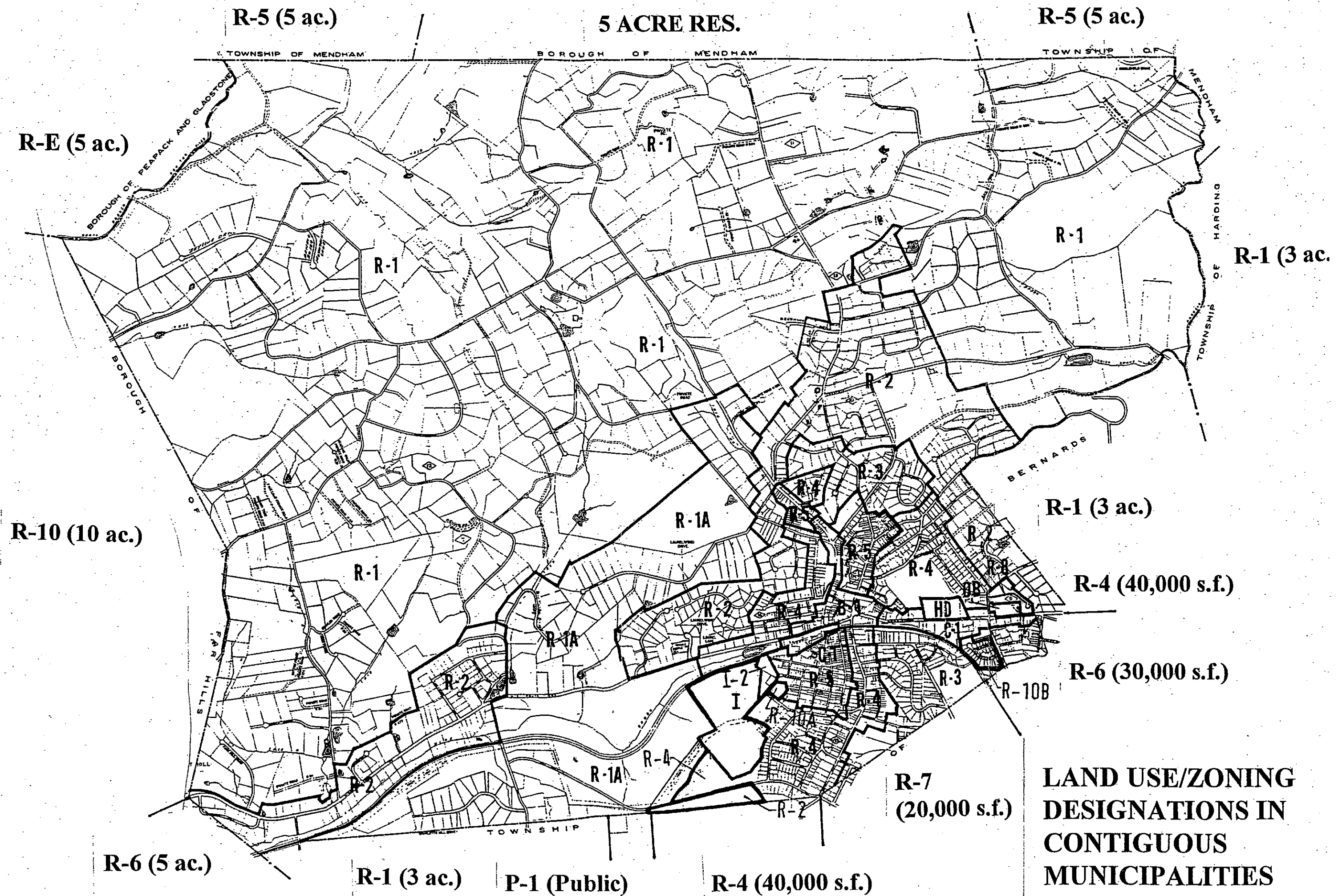
This Plan updates the above discussed 1987 Plan and consists in the main of broad concepts aimed at "building a consensus on regional planning priorities and smart growth strategies...." For example the land use chapter recommends in summary the following:

In addition to updating the County Master Plan's Land Use Management Map, the Land Use Element of the County Master Plan should emphasize the establishment of local and county-wide Transfer of Development Rights (TDR) programs, the development of comprehensive center plans for all designated centers and centers comprising endorsed plans, the assessment and prioritization of capital improvements countywide, modifications of the local land use policy framework to permit mixed use, neo-traditional development and redevelopment and the retrofit of certain suburban sprawl areas to be more village/town-like. The Land Use Element should also highlight ways to effectuate needed improvements in the functionality, quality and aesthetics of the built environment and place added emphasis on inter-jurisdictional coordination.

The Bernardsville Plan is compatible with the County Plan.

P. David Zimmerman, PP/AICP
Borough Planner

September 28, 2000



APPENDIX

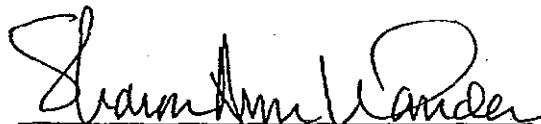
**EVALUATION OF WILDLIFE AND VEGETATION HABITATS,
ENDANGERED SPECIES HABITATS, AND UNIQUE OR DISAPPEARING HABITATS,
IN THE BOROUGH OF BERNARDSVILLE, SOMERSET COUNTY, NEW JERSEY**


SUBMITTED TO:

**ENVIRONMENTAL COMMISSION
BOROUGH OF BERNARDSVILLE**

PREPARED BY:

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DECEMBER 10, 1999

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Appendix A: New Jersey Endangered Species List (N.J.A.C. 7:25-4.13) and Endangered and Nongame Species Program List of Endangered and Threatened Species

Appendix B: Data Request to New Jersey Natural Heritage Program and Reply

**Evaluation of Wildlife and Vegetation Habitats,
Endangered Species Habitats, and Unique or Disappearing Habitats,
in the Borough of Bernardsville, Somerset County, New Jersey**

Introduction

Wander Ecological Consultants (WEC) was retained by the Borough of Bernardsville to identify vegetation and wildlife habitats, including habitats of Threatened and Endangered (T&E) species and habitats unique to or disappearing within undeveloped and previously unstudied areas of the municipality. This information will enable the Borough to identify those areas that merit additional investigation before development is permitted. The current study supplements the detailed surveys conducted by WEC in 1994-1995 of the Peters Tract, Little Brook Sanctuary, and the Upper Raritan Watershed Association tract along Claremont Road (Wander Ecological Consultants 1995).

Methodology

The principals of Wander Ecological Consultants conducted a windshield survey of all land visible from Borough roads. General habitat notes were recorded on a Borough zoning map. In addition, information on the location, extent, and configuration of habitats was obtained from a 1:12,000 mylar aerial photograph of the Borough graciously provided by the Upper Raritan Watershed Association (URWA). WEC queried the New Jersey Natural Heritage Program for the latest information from their database on occurrences of rare species and communities within the Borough, consulted *Birds of New Jersey*, the publication of the New Jersey Breeding Bird Atlas (BBA) (Walsh et al. 1999), and communicated with personnel of the New Jersey Audubon Society, whose Scherman-Hoffman sanctuaries are located in the Borough. Information from these sources was then transferred to a 1:12,000 Geographic Information Systems (GIS) map of Borough land uses provided to us by Paul Becker of the Environmental Commission. URWA then digitized the WEC information on this map to produce a GIS map of Borough habitats.

Results

WEC's investigation confirms that the Borough of Bernardsville, though rapidly developing, still includes significant areas of habitat valuable to wildlife and vegetation, including Threatened and Endangered species. These include:

Forest

The Borough's original vegetation community undoubtedly consisted almost entirely of deciduous forest with perhaps some small Eastern Hemlock groves in ravines, relatively small herbaceous dominated wetlands, and small upland successional fields in forest openings. However, as in all of New Jersey, no virgin forest remains in Bernardsville, although there are some areas of mature second- or third-growth. The forest that is extant has been seriously fragmented by urban, residential, and agricultural development and infrastructure such as roads and utility rights-of-way. Such fragmentation greatly reduces the habitability of the forest for area sensitive species of animals that require extensive areas of forest to provide food, shelter, and freedom from disturbance. It also alters the microclimate of the forest, thus adversely affecting habitat conditions for a host of smaller organisms (e.g., insects, fungi, and soil microorganisms) that are vital to the healthy functioning of the forest. Fragmentation also allows the invasion of exotic plant species (especially those not eaten by White-tailed Deer), to the obvious detriment of native species.

The Borough has no extensive forests left, but still has an interconnected series of moderate-sized forest patches that support generalist mammal species (e.g., White-tailed Deer, Raccoon, White-footed Mouse), numerous birds (including some neotropical migrants such as Scarlet Tanager and Wood Thrush but apparently not area-sensitive species—such as Barred Owl and Red-shouldered Hawk—that require large areas of habitat), and many species of reptiles and amphibians. The largest single forest tract is encompassed by a portion of the protected Jockey Hollow National Historical Park and New Jersey Audubon's Scherman-Hoffman Sanctuaries, in the northeastern section of the Borough. No other sizable forest areas are in public/conservation ownership.

Some of the larger unprotected tracts, are (1) between the eastern end of Little Brook Sanctuary and Dryden Road, (2) near the northern Borough boundary between Claremont Road and Mendham Road, (3) along the southwestern boundary southeast of Ravine Road,

and (4) in the center of the tract bounded by Post Kennel, Mount Harmony, and Douglas roads. Except for the lower reaches of Mine Brook, all stream corridors have forested zones along much of their lengths, although these are sometimes narrow or fragmented. No significant acreages of wetland forest occur within the Borough.

On the map prepared to accompany this report, WEC has noted corridors of forest that serve to connect more-extensive forest areas. These relatively narrow strips are important in that they provide corridors for movements of wildlife (for example, small organisms such as salamanders that cannot cross open areas owing to the risk of dehydration and predation). In a fragmented landscape such as exists in Bernardsville, where populations of organisms in small habitat patches may be extirpated (for example, by the severe summer drought of 1999), such corridors are vital to allow animals to disperse to more suitable areas in times of environmental stress, to provide genetic interchange between populations, and to allow recolonization of areas where populations have been extirpated.

Grassland

This habitat type includes hayfields, pastures, and grassy stages of successional fields with few or no shrubs. Grasslands are generally upland habitats; however, some wetland meadows may qualify as grassland. Although some species of wildlife (such as White-tailed Deer and Red-tailed Hawk) utilize both forest and grassland, the latter generally provides habitat for a different suite of species, from birds to butterflies. Grassland habitats, which in the East are largely associated with agricultural uses, are rapidly disappearing in New Jersey, and a number of bird species that utilize them are listed as Threatened or Endangered. The Borough includes a few fairly sizable areas of grassland habitat in the northwestern area and along Mine Brook. Other scattered, smaller patches of this habitat are not used by T&E bird species, but may be valuable to insects and other wildlife, and for vegetation diversity.

Brushland

Brushland denotes later stages of successional fields, which are partially or largely dominated by shrubs (such as native dogwoods, viburnums, and blackberries, or the invasive aliens Multiflora Rose, Autumn-olive, and Morrow Honeysuckle), small trees such as Flowering Dogwood and Eastern Redcedar, and saplings of "pioneer" tree species

such as Gray Birch and Black Cherry. Because it incorporates elements of both open and forested habitats, brushland may support a high diversity of wildlife species.

This transitory habitat is uncommon in the Borough, with scattered small patches mostly in the northwestern and extreme southwestern sections. Little Brook Sanctuary incorporates a particularly valuable example of such a habitat, as it has a mostly open field dominated by the very important Little Bluestem grass and goldenrods that is being "invaded" by mostly native tree and shrub species. This stage of brushland is particularly valuable for butterflies, as the larvae of several uncommon species feed on Little Bluestem. No similar bluestem-dominated fields were observed during WEC's windshield survey, but some may not have been visible from roads.

Stream Corridors

Streams provide habitat for aquatic species (fish and numerous invertebrates) and semiaquatic species (turtles, frogs, salamanders, and certain snakes) and a source of drinking and bathing water for upland species, and often have associated wetlands that increase vegetation diversity. Even in developed areas they often support a fringe of vegetation that provides shelter and movement corridors for wildlife.

The Borough of Bernardsville incorporates numerous stream corridors bordered with mostly substantial zones of vegetation, often forest. The northeastern portion of the Borough is bounded by a relatively unspoiled stretch of the upper Passaic River, into which drain Indian Grave (or Grove) Brook and its tributaries. All of these streams are classified by the State of New Jersey as Trout Production waters, meaning that they support reproduction by one or more native species, in this case Brown and Rainbow Trout. Streams in the remainder of the Borough are tributary to the North Branch of the Raritan River, which also forms the Borough's northwestern boundary. Streams in the northwestern section of the Borough (north of Ravine Road and Mountain Top Road) drain to the North Branch above Ravine Lake, where it is classified as Trout Production, and thus are also classified as Trout Production. All other streams drain into Ravine Lake or to the North Branch below Ravine Lake, and are classified as Trout Maintenance.

Wetlands

Very little wetland habitat is present within the Borough of Bernardsville. The New Jersey Freshwater Wetlands Maps indicate that, with the exception of some fairly extensive Modified Agricultural wetlands (pastureland and hayfields) on Meadowbrook Farm along Rt. 202, wetlands in the Borough consist mainly of a few small, scattered patches of Palustrine Deciduous Forest along stream corridors, and even fewer very small Palustrine Emergent (i.e., herbaceous) wetlands. Except for the Meadowbrook Farm wetlands, none of these is large enough to potentially provide habitat for any of the area-sensitive T&E species.

Habitats for Threatened and Endangered Species

The list of animal species classified as Endangered in the State of New Jersey appears at N.J.A.C. 7: 25-4.13. In addition, the Endangered and Nongame Species Program classifies certain species as Threatened. Both lists appear in Appendix A. The New Jersey Natural Heritage Program, whose classification system for rare species appears in Appendix B, indicates that Cooper's Hawk and Wood Turtle (both state Threatened) have been observed in the Borough of Bernardsville. They have no records of rare plants or rare communities in their database for the Borough. As their information indicates, however, lack of records does not necessarily mean that these elements are absent. For example, owing to the existence of many large estates in the Borough, detailed field surveys necessary to discover elements such as rare plants cannot be conducted.

Cooper's Hawk. Cooper's Hawk is tolerant of human disturbance and habitat fragmentation, and may breed in suburban and even urban areas (Rosenfield et al. 1996). As summarized in Rosenfield and Bielefeldt (1993), in the East this species may occupy deciduous, mixed, and evergreen forests. It uses a wide variety of tree species for the nest site. Likewise, a wide range of tree diameters (8-20 in.), percent canopy closure (64%-95%), and tree densities (97-464/ac.) have been recorded at Cooper's Hawk nest sites. The nest site is often within 1 km. of water. Forest edge habitat is generally included within the home range of breeding birds, possibly representing their primary hunting habitat. It has been theorized, but not documented, that nests are located in proximity to hunting areas with dense prey populations.

Walsh, et al. (1999) reports that populations of the state Threatened Cooper's Hawk have been increasing over the last two decades, and the species is now the third most common breeding raptor in New Jersey. It breeds throughout much of the state, though more commonly in the north. Breeding was confirmed in the Bernardsville NE Breeding Bird Atlas block, as well as in the Mendham SE and SW blocks, and possible breeding activity was observed in the Bernardsville NW and Gladstone NE blocks, all of which cover portions of the Borough. (Breeding Bird Atlas blocks are subdivisions of the USGS 7.5-minute topographic quadrangles—see Walsh et al. 1999). Richard Kane, Director of the New Jersey Audubon Scherman-Hoffman Sanctuary, confirmed that one of the definite breeding records was in Bernardsville. Owing to the presence of extensive suitable forested habitat, it is likely that Cooper's Hawk also breeds elsewhere in the Borough.

Wood Turtle. Historically, Wood Turtle ranged throughout northern New Jersey, except for Hudson County, and into southern New Jersey as far as Gloucester and Atlantic counties. It now occurs in disjunct populations along certain drainages within its former range, such as the Wallkill and Paulins Kill in Sussex County, the Ramapo River in Bergen County, and the Passaic River in Morris County (Torok 1999).

Wood Turtles require a combination of aquatic and terrestrial habitat. According to Torok (1999), in New Jersey they are primarily terrestrial from mid-May to October, utilizing streams for mating (in April-May and September-October) and hibernating. Hibernation takes place in stream bottoms, under overhanging streambanks or tree roots, and in muskrat burrows. After instream mating, eggs are laid in upland areas with soft soil, such as cultivated fields. Terrestrial habitat is highly variable, and includes the wooded and marshy borders of streams, alder thickets, Multiflora Rose thickets, floodplain forest, upland forest, agricultural fields, and successional fields. Although several studies have shown that most activity takes place within 98-130 feet of the home stream, there have been reports of movements as far as 340-1300 feet into uplands.

Wood Turtle is likely to occur along any of the Trout Production streams in the Borough, and may possibly inhabit other drainages if water quality is suitable and its required habitats are present along the stream. Richard Kane confirmed that this species has been observed at the Scherman-Hoffman Sanctuary.

Habitats for Other T&E Bird Species. Breeding Bird Atlas (BBA) records indicate that other T&E bird species are known to breed, or may breed, in the vicinity of the

Borough of Bernardsville. (The BBA classifies species as Confirmed, Probable, or Possible breeders, depending on the strength of the evidence obtained by observers—see Walsh, et. al., p. 33). In our opinion the Borough provides suitable habitat for only a few of these.

Northern Harrier. This state Endangered hawk breeds at only a few locations in the state, mostly coastal marshes. In the New Jersey BBA it was recorded as a Possible breeder in the Bernardsville CE block—probably in the nearby Great Swamp—and there was a Confirmed record for southern Somerset County. The Borough does not encompass any marshes or grasslands large enough to accommodate this species as a breeder, although it probably occasionally occurs in migration or winter.

Red-shouldered Hawk. This species, whose breeding population is considered Endangered in New Jersey, was Confirmed as a breeder in the Bernardsville CE block of the BBA, and listed as a Possible breeder in the Bernardsville NE block. Both of these records were probably from the Great Swamp National Wildlife Refuge, as in New Jersey this species breeds only in extensive wetland forests. The Borough does not include any large wetland forests, therefore Red-shouldered Hawk is unlikely to breed here. It may, however, occur along larger stream corridors in winter or on migration, when it is considered Threatened.

Sedge Wren. This rare and extremely irregular Endangered breeder was Confirmed nearby in the Bernardsville SE BBA block. However, no portion of the Borough falls within this block, therefore the Borough cannot claim this notable record. Although it is highly unlikely, Sedge Wren could conceivably nest in the wet meadows of Meadowbrook Farm.

American Bittern. A Possible breeding record in the Bernardsville NE BBA block for this Threatened inhabitant of large marshes undoubtedly comes from the Great Swamp NWR. The Borough does not include any emergent marshes large enough to support this species.

Barred Owl. Confirmed breeding records for this Threatened species in the Bernardsville NE and CE blocks are also from the Great Swamp NWR. Like Red-shouldered Hawk, Barred Owl inhabits only extensive forested areas, usually wetlands,

and is unlikely to occur as a breeding bird in the Borough except perhaps along the Passaic River near Jockey Hollow and the Scherman-Hoffman Sanctuaries Hoffman Sanctuary.

Red-headed Woodpecker. A Probable breeding record for the Threatened Red-headed Woodpecker in the Bernardsville NE BBA block likely comes from the Great Swamp NWR. This species breeds in open, parklike stands of mature trees, a habitat that WEC did not observe in the Borough.

Grasshopper Sparrow. This is the most common of the Threatened grassland-breeding sparrows in New Jersey. Although not recorded in Bernardsville on the BBA, it was listed as Probable or Confirmed in six nearby blocks. Grasshopper Sparrow nests in relatively dry grasslands, and is less demanding of large expanses of habitat than the other sparrows. It could occur in grasslands of 10 acres or more within the Borough, but would probably be an irregular breeder. Richard Kane confirmed that he did not find this species in the Borough despite the availability of seemingly suitable habitat.

Savannah Sparrow. The nearest BBA occurrence of this Threatened species was as a Possible breeder in the Bernardsville SW block, but not in the Borough itself. It nests in more densely vegetated and somewhat moister grasslands than Grasshopper Sparrow, and could possibly breed in the larger grasslands within the Borough such as at Meadowbrook Farm and adjacent grasslands.

Bobolink. The Threatened Bobolink generally nests in lush hayfields. It is listed as a Probable breeder in the Mendham SW, Bernardsville NE and NW, and Gladstone NE blocks. Potentially suitable habitat for this Threatened species is present in the Borough in the Bernardsville NW and Gladstone NE blocks. Meadowbrook Farm and the adjacent grasslands appear to represent suitable breeding habitat.

Habitats for Other T&E Reptiles and Amphibians. The Borough of Bernardsville may encompass suitable habitat for the following T&E reptiles and amphibians, in addition to Wood Turtle, discussed earlier:

Bog Turtle. As discussed in Tesauro (1999) this Endangered reptile inhabits open, meadow-like wetlands fed by groundwater springs and seeps. Calcareous fens are among the best such habitats. Such areas are often in headwater areas of tributary streams or

within the floodplain of larger streams. These habitats typically feature cool, slowly-moving water flowing in defined rivulets over a substrate of soft, organic mud. Habitat suitability declines as shrub and tree cover increases above 75%. Bog Turtles may also be found in pockets of emergent wetland within forested wetlands.

This species has been recorded in Somerset County, as indicated in the NJNHP printout, but has not been observed in this county in recent years (Sciascia 1997). WEC observed only one area of potentially suitable habitat for Bog Turtle—a small wetland east of Dryden Road and south of Turnbull Lane at the headwaters of one of the Trout Production tributaries of the North Branch. It is possible that other small but suitable pockets of wetland habitat for this species are present in areas not visible from Borough roads.

Long-tailed Salamander. This Threatened species inhabits the environs of small, swift streams with good water quality in forested areas, shale banks with seepages, hillside springs, caves and cavelike environments, and sometimes pond margins (Stein 1997, Petranka 1998). Formerly widely distributed in the Ridge and Valley, Piedmont, and Highlands Physiographic Provinces of New Jersey, it now appears to be restricted to Warren, southern Sussex, and western Hunterdon counties (Stein 1997). As noted in WEC's 1995 report, in the 1970's a Long-tailed Salamander was observed along a tributary of McVickers Brook where it flows across the Roxiticus Golf Course, approximately one mile upstream of Pleasant Valley Lake (R. Stein, personal communication); however, this species is apparently no longer found in this location. Nevertheless, it is possible that it occurs in the Trout Production streams within the Borough that are tributary to the North Branch, as extensive stretches of these streams are not accessible to investigators. WEC did not find Long-tailed Salamander in its 1994-95 investigation of little Brook Sanctuary, which includes a portion of one of these streams, and the Upper Raritan River Watershed property (tributary to mine Brook). It is unlikely that this species occurs in the Borough but it is possible that a more-extensive survey of suitable habitats may discover a few individuals.

Mammals and Invertebrates. The Borough does not include any habitat suitable for any of the mammals or invertebrates listed by NJDEP as Endangered.

Plants. Although the New Jersey Natural Heritage Program has no records of rare plants from the Borough, this probably results from a lack of field investigation, as any of the existing natural habitats could support such species. In addition to habitat loss, a particular

danger to such species has become the proliferation of White-tailed Deer, which in concentrated populations heavily overbrowse many species of native plants. In our opinion a thorough investigation performed by a qualified field botanist would almost certainly uncover the presence of several rare plants in the Borough. Although some of these observations would probably come from areas already mentioned in this report, it is entirely possible that one or more records would be from somewhat more developed areas.

It should be noted that populations of many Threatened and Endangered species are variable in their occurrence both spatially and temporally—i.e., they may appear in certain places and/or certain years and not in others. Grassland birds are especially irregular in their occurrence, particularly in marginal habitats. Among plants, orchids (many of which are rare in New Jersey) are notorious for their unpredictable appearance, often going many years between flowering, or even appearing aboveground, in a given location. The Environmental Commission may therefore wish to maintain regular communications with the New Jersey Natural Heritage Program and the New Jersey Audubon Society regarding their latest records for T&E species.

Recommendations

The areas identified in this report as representing important habitats for wildlife and plants, including Threatened and Endangered species, need protection. The most obvious threats are (1) habitat loss or fragmentation caused by development, (2) degradation of the water quality of streams owing to non-point-source pollution such as stormwater runoff and lawn-maintenance chemicals, and (3) overbrowsing of native vegetation by White-tailed Deer.

It is vital that development proposals be carefully scrutinized with regard to their impact on the Borough's shrinking and fragmented forests, grasslands, brushlands, and stream corridors. Every effort should be made to avoid development that will encroach on or fragment the few sizable forest tracts remaining in the Borough, or interrupt existing forest corridors vital to wildlife movements. In order to properly evaluate probable effects of development, applicants for site plan or subdivision approval should be required to provide escrow funds to enable the municipality to hire qualified environmental consultants to prepare environmental impact statements, review development plans and/or conduct

thorough onsite wildlife and vegetation inventories. WEC does not consider it desirable for applicants to hire their own consultants directly. Often such studies are done by poorly qualified employees of the engineering companies that prepared the plans, which seldom results in a knowledgeable (or impartial) report. However, when even a qualified consultant is hired directly by an applicant, the potential for a biased opinion is obvious.

Water-quality issues, especially for activities impacting Trout Production waters, should be among those most carefully scrutinized. Major subdivisions and commercial site plans should include stormwater detention basins designed to control the one-year storm—the most important storm in terms of producing adverse water-quality impacts. In addition to reducing (but not eliminating) pollutants, such basins are important in reducing thermal impacts (i.e., discharge of stormwater heated by flowing over hot impervious surfaces in summer) to Trout Production waters. The retention of forested corridors along streams is also critical to the maintenance of cool water temperatures important for trout and other aquatic species. An often overlooked contributor to stream impacts is improper installation and inadequate monitoring of soil erosion and sediment control measures (primarily silt fences) at construction sites. Many such fences are installed without burying the bottom six inches of the fence (thus rendering the fence totally ineffective), and often they are not inspected regularly during the course of the construction project to detect and remedy failures.

In our earlier report for the Environmental Commission, WEC discussed at length the problems involved with impacts from White-tailed Deer (Wander Ecological Consultants 1995). In addition to the obvious hazard of automobile collisions and the nuisance caused by browsing on landscape plants, deer in many places are causing catastrophic declines in native plant species (and often consequent explosions in undesirable alien species). It is probable that few places in the Borough exist where their browsing has not markedly to severely altered the composition of the native plant community in ways that will adversely affect the functioning of habitats (including the wildlife they can support) for the foreseeable future. Control of the deer population is of course highly desirable. In the opinion of WEC the only viable long-term resolution to this difficult and very controversial and emotionally charged problem is contraception, perhaps combined with hunting in selected heavily impacted areas.

WEC believes that with careful planning, conscientious evaluation of the impacts of proposed development projects by the planning board and environmental commission, and

rigorous monitoring of ongoing construction projects, protection can be provided to the remaining habitat resources of the Borough of Bernardsville.

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- Certified Wetland Delineator #WDCP94MD0310150B by the U.S. Army Corps of Engineers
- Certified Professional Wetland Scientist #000646 by the Society of Wetland Scientists

Dr. Wander is a very experienced terrestrial and wetlands ecologist who has more than 20 years' active field experience. Following a career as a textbook copy editor for major publishing companies, she has worked as an independent ecological consultant since 1974, and is currently on retainer as a senior environmental scientist to the international consulting engineering firm of Louis Berger & Associates, Inc.

Dr. Wander has seven years of teaching experience in the life sciences at Rutgers University, and has received support for ornithological research from such prestigious organizations as the American Museum of Natural History and the World Wildlife Fund. She is currently on the faculty of the Cook College Office of Continuing Professional Education, teaching short courses on wetland topics and on Threatened and Endangered species.

As the managing partner of Wander Ecological Consultants, Dr. Wander has prepared several hundred wetland delineation reports and numerous wildlife and vegetation inventories, environmental impact statements, Threatened & Endangered species reports, and environmentally sensitive areas protection plans. She has conducted numerous surveys for Threatened and Endangered species of birds, herptiles, and plants in the Pinelands Natural Reserve/Pinelands Area and CAFRA zone, and elsewhere in NJ, NY, and PA. Animal species involved include Great Blue Heron, Peregrine Falcon, Northern Harrier, Upland Sandpiper, Savannah Sparrow, Grasshopper Sparrow, Pine Barrens Treefrog, Bog Turtle, Wood Turtle, Northern Pine Snake, Timber Rattlesnake, and Corn Snake. Botanical surveys have been performed for the Federally Threatened Swamp Pink, Small Whorled Pogonia, and Knieskern's Beakrush, as well as for Narrow-leaved Vervain, Cuckoo Flower, Barratt's Sedge, Pinebarren Sand-reedgrass, Virginia False Gromwell, Twisted Spikerush, and Swamp Beggar Ticks (*Bidens bidentoides*).

Dr. Wander has testified on numerous occasions before municipal boards and at arbitration hearings. Dr. Wander has also acted as a special environmental consultant to municipal boards reviewing environmental safeguards for proposed development projects, including golf courses. Dr. Wander has been qualified as an ornithologist by the NJDEP and is certified as a wetland professional by two organizations.

Professional Affiliations: The Society of Wetland Scientists, The Association of State Wetland Managers, the Wildlife Society, and the Natural Areas Association.

Wade Wander

M.Sc. in Ecology, Rutgers University, 1980. *Thesis topic:* Temporal Distribution, Age Separation, and Feeding Habitat Preference as Factors in the Ecological Segregation of Migrating Shorebirds at Jamaica Bay Wildlife Refuge, New York City.

B.S. in Wildlife Ecology, Cook College, Rutgers University, 1976

- Former Research Associate of the NJ Audubon Society
- Scientific Advisor to New Jersey Breeding Bird Atlas Project
- Member of the Check-list Committee of the New York City Butterfly Club
- Certified SCUBA diver (advanced)
- Certified wetland delineator #WDCP93MD0910074B by the U.S. Army Corps of Engineers
- Certified professional wetland scientist #000416 by the Society of Wetland Scientists

Mr. Wander has more than 25 years of zoological and botanical field experience throughout North, Central and South America, as well as East Africa, the Caribbean, and Australia. He has been an independent environmental consultant since 1974 and since 1985 has been on retainer as a Senior Environmental Scientist at Louis Berger Associates. He has conducted research on New Jersey Threatened and Endangered (T&E) species funded by the state Nongame and Endangered Species Program, and has conducted many T&E surveys in New Jersey and other states. Since 1986, Mr. Wander has conducted more than 1000 wetland delineations and inspections throughout New Jersey and elsewhere in the northeast and midwest. He is very experienced in dealing with various state and federal regulatory agencies, and in presenting expert testimony before municipal boards and in court. He is on the faculty of the Cook College Office of Continuing Professional Education, in which capacity he teaches courses on wetland plant identification and Threatened and Endangered species.

Mr. Wander was principal investigator for the U.S. Fish & Wildlife Service project that documented the international importance of the Delaware Bayshore as a migration stop for hundreds of thousands of shorebirds. He has written articles for both technical and popular publications, has taught classes in ornithology and herpetology, and has lectured extensively on a variety of natural-history topics. As experts on Threatened and Endangered species, Dr. and Mr. Wander have organized a 2-day seminar on the T&E species of New Jersey for the Cook College Office of Continuing Professional Education, presented annually since 1997. Mr. Wander has been qualified as an ornithologist by the NJDEP and is certified as a wetland professional by two organizations.

Professional Affiliations: The Society of Wetland Scientists, The Association of State Wetland Managers, the Wildlife Society, and the Natural Areas Association.

APPENDIX A
NEW JERSEY ENDANGERED SPECIES LIST (N.J.A.C. 7:25-4.13)
AND ENDANGERED AND NONGAME SPECIES PROGRAM LIST
OF ENDANGERED AND THREATENED SPECIES

2. To use as food, or to utilize the hide, skin, or other body parts;

3. Euthanasia by an agent of the Division or as ordered by the Commissioner;

4. When an animal creates a danger or serious threat to persons or other animals as determined by the Commissioner; or

5. Euthanasia of research animals held under the scientific holding permits or scientific collecting permit.

Amended by R.1984 d.132, effective April 16, 1984.

See: 16 N.J.R. 97(b), 16 N.J.R. 889(a).

Amended by R.1991 d.132, effective March 18, 1991.

See: 23 N.J.R. 37(a), 23 N.J.R. 848(b).

Added (c).

Amended by R.1995 d.48, effective January 17, 1995.

See: 26 N.J.R. 1040(a), 27 N.J.R. 329(a).

7:25-4.12 Notice of a denial of permit, procedure, review, time limitations, hearing

(a) In the event of a denial of an application for any permit required by this subchapter or the revocation of any permit, the Division shall issue to the applicant or prior permittee a written statement setting forth the reasons for the denial or revocation.

(b) Any such person may request a hearing for a review of such determination within 30 days from the date of issuance of the denial, pursuant to the applicable provisions of the Administrative Procedure Act. The request for a hearing shall be sent to the Office of Legal Affairs, ATTENTION: Adjudicatory Hearing Requests, Department of Environmental Protection, CN 402, Trenton, New Jersey 08625-0402.

(c) Any permittee shall permit division personnel, at any reasonable time to inspect the housing facilities of the animal or animals to determine compliance with the permit requirements and criteria.

Administrative change in (b).

See: 23 N.J.R. 3325(b).

Amended by R.1995 d.48, effective January 17, 1995.

See: 26 N.J.R. 1040(a), 27 N.J.R. 329(a).

7:25-4.13 List of endangered species

(a) Section 23:2A-4 of the revised statutes provides that the Department shall conduct investigations concerning wildlife in order to develop information relating to populations, distributions, habitat needs, limiting factors and other biological and ecological factors. On the basis of such investigations of wildlife and other available scientific and commercial data, the Department may by regulation promulgate a list of those species and subspecies of wildlife indigenous to the State which are determined to be endangered, giving their common and scientific names by species and subspecies.

(b) In accordance therewith, the following species are determined to be endangered:

1. Shortnose Sturgeon, *Acipenser brevirostrum*
2. Trembly's Salamander, *Ambystoma tremblayi*
3. Blue-spotted Salamander, *Ambystoma laterale*
4. Eastern Tiger Salamander, *Ambystoma tigrinum tigrinum*
5. Pine Barrens Treefrog, *Hyla andersoni*
6. Southern Gray Treefrog, *Hyla chrysocelis*
7. Bog Turtle, *Clemmys muhlenbergi*
8. Timber Rattlesnake, *Crotalus horridus horridus*
9. Corn Snake, *Elaphe guttata guttata*
10. Bald Eagle, *Haliaeetus leucocephalus*
11. Peregrine Falcon, *Falco peregrinus*
12. Northern Goshawk, *Accipiter gentilis*
13. Northern Harrier, *Circus cyaneus*
14. Red-shouldered Hawk, *Buteo lineatus* (Breeding population)
15. Short-eared Owl, *Asio flammeus*
16. Pied-billed Grebe, *Podilymbus podiceps*
17. Upland Sandpiper, *Bartramia longicauda*
18. Sedge Wren, *Cistothorus platensis*
19. Loggerhead Shrike, *Lanius ludovicianus*
20. Henslow's Sparrow, *Ammodrammus henslowii*
21. Vesper Sparrow, *Poocetes gramineus*
22. Piping Plover, *Charadrius melodus*
23. Roseate Tern, *Sterna dougallii*
24. Least Tern, *Sterna abifrons*
25. Black Skimmer, *Rynchops niger*
26. Atlantic Hawksbill, *Eretmochelys imbricata imbricata*
27. Atlantic Loggerhead, *Caretta caretta*
28. Atlantic Ridley, *Lepidochelys kempi*
29. Atlantic Leatherback, *Dermochelys coriacea coriacea*
30. Sperm Whale, *Physeter catodon*
31. Blue Whale, *Balaenoptera musculus*
32. Finback Whale, *Balaenoptera physalus*
33. Sei Whale, *Balaenoptera borealis*
34. Humpback Whale, *Megaptera novaeangliae*
35. Right Whale, *Eubalaena glacialis*
36. Bobcat, *Lynx rufus*
37. Eastern Woodrat, *Neotoma floridana*

[ENSP logo] Endangered and Threatened Wildlife of New Jersey

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

List updated 10/1/99.

BIRDS

Endangered		Threatened	
Bittern, American	<i>Botaurus lentiginosus*</i>	Bobolink	<i>Dolichonyx oryzivorus</i>
Eagle, bald	<i>Haliaeetus leucocephalis**</i>	Hawk, red-shouldered (breeding)	<i>Buteo lineatus</i>
Falcon, peregrine	<i>Falco peregrinus**</i>	Hawk, red-shouldered (non-breeding)	<i>Buteo lineatus</i>
Goshawk, northern	<i>Accipiter gentilis</i>	Heron, Black-crowned night	<i>Nycticorax nycticorax</i>
Grebe, pied-billed	<i>Podilymbus podiceps*</i>	Knot, red	<i>Calidris canutus</i>
Harrier, northern	<i>Circus cyaneus*</i>	Osprey	<i>Pandion haliaetus</i>
Hawk, Cooper's	<i>Accipiter cooperii</i>	Owl, barred	<i>Strix varia</i>
Night-heron, yellow-crowned	<i>Nyctanassa violaceus</i>	Owl, long-eared	<i>Asio otus</i>
Owl, short-eared	<i>Asio flammeus*</i>	Rail, black	<i>Laterallus jamaicensis</i>
Plover, piping	<i>Charadrius melodus**</i>	Sparrow, grasshopper	<i>Ammodramus savannarum</i>
Sandpiper, upland	<i>Batrachia longicauda</i>	Sparrow, Savannah	<i>Passerculus sandwichensis</i>
Shrike,	<i>Lanius</i>	Woodpecker,	<i>Melanerpes</i>

Treefrog, pine
barrens

Hyla andersonii

Treefrog, southern
gray

Hyla chrysocelis

MAMMALS

Endangered

Bobcat	<i>Lynx rufus</i>
Woodrat, Eastern	<i>Neotoma floridana</i>
Whale, sperm	<i>Physeter macrocephalus**</i>
Whale, fin	<i>Balaenoptera physalus**</i>
Whale, sei	<i>Balaenoptera borealis**</i>
Whale, blue	<i>Balaenoptera musculus**</i>
Whale, humpback	<i>Megaptera novaeangliae**</i>
Whale, black LEFT	<i>Balaena glacialis**</i>

**Federally Endangered

INVERTEBRATES

Endangered

Mitchell's Satyr (butterfly)	<i>Neonympha m. mitchellii**</i>
Northeastern Beach Tiger Beetle	<i>Cincindela d. dorsalis</i>
American Burying Beetle	<i>Nicrophorus americanus**</i>
Dwarf Wedge Mussel	<i>Alasmidonta heterodon**</i>

FISH

Endangered

Sturgeon, shortnose *Acipenser brevirostrum***

Return to Endangered and Nongame Species Program Homepage

[Back to Fish, Game and Wildlife Homepage] [Back to NJ State Homepage] [Back to NJ DEP E

APPENDIX B
DATA REQUEST TO NEW JERSEY NATURAL HERITAGE PROGRAM
AND REPLY



Wander Ecological Consultants

28 Warner Road, Newton, New Jersey 07860 Phone/Fax: (201) 579-2293
Wetland Delineations • Endangered Species Surveys • Vegetation and Wildlife Inventories
Habitat Evaluation • Impact Assessments • Mitigation Proposals • Ecological Research

November 10, 1998

NJ Department of Environmental Protection
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
CN 404
Trenton, NJ 08625-0404

Dear Sir/Madam:

By this letter I am requesting that the Natural Heritage Program search its database and provide us with records of rare and endangered species and natural communities on, and in the general vicinity of, the Borough of Bernardsville, Somerset County, NJ. We need this information for an Environmental Resource Inventory that we are compiling for the Township.

Enclosed are a completed data request form and a composite copy of the Bernardsville, Mendham, and Gladstone topographic quadrangles with the study area outlined in black.

If you have any questions, please call us.

Thank you,

Sharon Ann Wander, Ph.D.
Managing Partner



State of New Jersey

Christine Todd Whitman
Governor

Department of Environmental Protection

Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
CN 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

Robert C. Shinn, Jr.
Commissioner

November 23, 1998

Sharon Ann Wander
Wander Ecological Consultants
28 Warner Road
Newton, NJ 07860

Re: Borough of Bernardsville Natural Resource Inventory

Dear Ms. Wander:

Thank you for your data request regarding rare species information for Bernardsville Borough, Somerset County.

Enclosed is a list of rare species and natural communities documented from Bernardsville Borough. Additionally, enclosed is a list of rare species and natural communities documented from Somerset County. This county list(s) can be used as a master species list for directing further inventory work. If suitable habitat is present at a project site, these species have potential to be present. If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend you contact the Division of Fish, Game and Wildlife, Endangered and Nongame Species Program.

In order to red flag the general locations of documented occurrences of rare and endangered species and natural communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Bernardsville, Gladstone, and Mendham USGS quadrangles. If individual projects are to be located in the shaded areas of these maps, the Natural Heritage Program can be contacted for additional information.

PLEASE SEE THE ATTACHED 'CAUTIONS AND RESTRICTIONS ON NHP DATA'.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for

Treefrog, pine
barrens

Hyla andersonii

Treefrog, southern
gray

Hyla chrysocelis

MAMMALS

Endangered

Bobcat	<i>Lynx rufus</i>
Woodrat, Eastern	<i>Neotoma floridana</i>
Whale, sperm	<i>Physeter macrocephalus**</i>
Whale, fin	<i>Balaenoptera physalus**</i>
Whale, sei	<i>Balaenoptera borealis**</i>
Whale, blue	<i>Balaenoptera musculus**</i>
Whale, humpback	<i>Megaptera novaeangliae**</i>
Whale, black LEFT	<i>Balaena glacialis**</i>

**Federally Endangered

INVERTEBRATES

Endangered

Mitchell's Satyr (butterfly)	<i>Neonympha m. mitchellii**</i>
Northeastern Beach Tiger Beetle	<i>Cincindela d. dorsalis</i>
American Burying Beetle	<i>Microphorus americanus**</i>
Dwarf Wedge Mussel	<i>Alasmidonta heterodon**</i>

FISH

Endangered

Sturgeon, shortnose *Acipenser brevirostrum***

Return to Endangered and Nongame Species Program Homepage

[Back to Fish, Game and Wildlife Homepage] [Back to NJ State Homepage] [Back to NJ DEP E

DEP - Division of Parks & Forestry, Office of Natural Lands Management
NATURAL HERITAGE DATA REQUEST FORM

This form is used to request a search of the Natural Heritage Database for records of rare or endangered species and natural communities on or near a project site. The Natural Heritage Program provides the information in order to assist the requestor in preserving habitat for rare and endangered species and natural communities.

To initiate a search, please provide: A) A letter explaining the project; B) A copy of a USGS quad map(s) delineating the bounds of the project site; C) A completed data request form.

Completed request to: Office of Natural Lands Management, Natural Heritage Program, PO Box 404, South Clinton Avenue, Trenton, NJ 08625-0404.

Sharon Ann Wander

Wander Ecological Consultants

28 Warner Road

Newton, NJ 07860

(973) 579-2293

PROJECT OR SITE NAME Borough of Bernardsville Natural Resource Inventory

COUNTY (CHECK THOSE THAT APPLY):

ANTIC	BERGEN	BURLINGTON	CAMDEN	CAPE MAY	CUMBERLAND	ESSEX
CHESTER	HUDSON	HUNTERDON	MERCER	MIDDLESEX	MONMOUTH	MORRIS
DAWSON	PASSAIC	SALEM	SOMERSET X	SUSSEX	UNION	WARREN

QUAD(S):

Bernardsville, Mendham, Gladstone

Material supplied by the Office of Natural Lands Management will not be published without crediting the Natural Heritage Database as the source of the material. It is understood that there will be a charge of \$10 per hour for the services requested. An invoice will be sent with the request response and payment should be made by check or money order payable to "Office of Natural Lands Management."

Needed ASAP

Signature

Sharon Ann Wander 11/15/98

(reverse side of form)

FOR OFFICE USE ONLY

DATE RECEIVED

Code: REG ST RTC NC

RECEO STEO RTCEO NCEO

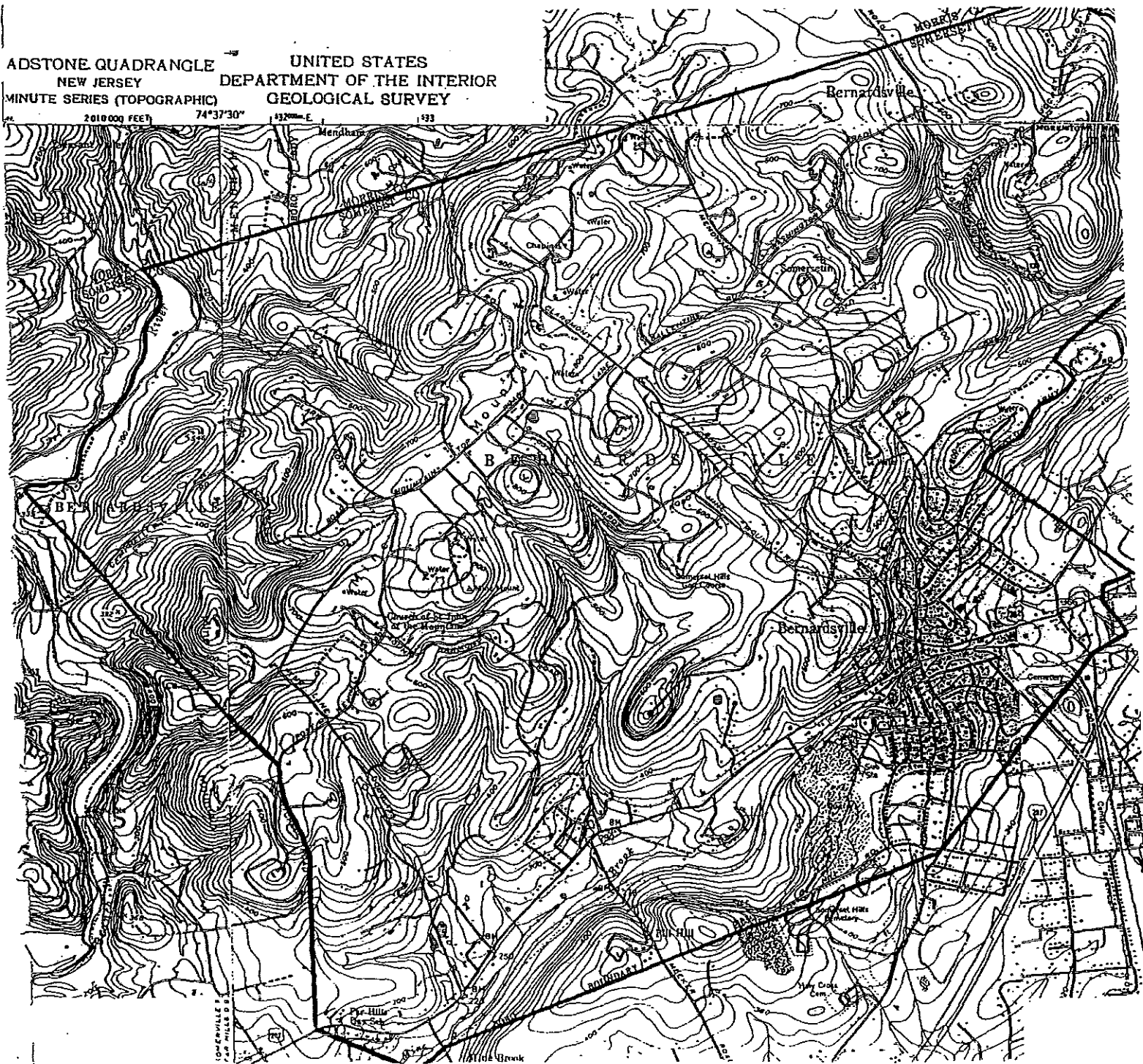
Project Code:

Inv. #:

ADSTONE QUADRANGLE
NEW JERSEY
MINUTE SERIES (TOPOGRAPHIC)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

2010000 FEET 74°37'30" 1320000 E 133



NATURAL LANDS MANAGEMENT

CAUTIONS AND RESTRICTIONS ON NATURAL HERITAGE DATA

The quantity and quality of data collected by the Natural Heritage Program is dependent on the research and observations of many individuals and organizations. Not all of this information is the result of comprehensive or site-specific field surveys. Some natural areas in New Jersey have never been thoroughly surveyed. As a result, new locations for plant and animal species are continuously added to the data base. Since data acquisition is a dynamic, ongoing process, the Natural Heritage Program cannot provide a definitive statement on the presence, absence, or condition of biological elements in any part of New Jersey. Information supplied by the Natural Heritage Program summarizes existing data known to the program at the time of the request regarding the biological elements or locations in question. They should never be regarded as final statements on the elements or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments. The attached data is provided as one source of information to assist others in the preservation of natural diversity.

This office cannot provide a letter of interpretation or a statement addressing the classification of wetlands as defined by the Freshwater Wetlands Act. Requests for such determination should be sent to the DEP Land Use Regulation Program, CN 401, Trenton, NJ 08625-0401.

This cautions and restrictions notice must be included whenever information provided by the Natural Heritage Database is published.

20 NOV 1998

BERNARDSVILLE BOROUGH, SOMERSET COUNTY
 RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
 THE NEW JERSEY NATURAL HERITAGE DATABASE

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL GRANK STATUS	SRANK	DATE OBSERVED	IDENT.
*** Vertebrates							
ACCIPITER COOPERII	COOPER'S HAWK		E	G5	S3B, S4N	1993-07-??	Y
ARDEA HERODIAS	GREAT BLUE HERON		T/S	G5	S2B, S4N	1997-04-27	Y
CLEMMYS INSCULPTA	WOOD TURTLE		T	G4	S3	1993-05-05	Y
CLEMMYS INSCULPTA	WOOD TURTLE		T	G4	S3	1997-05-??	Y

4 Records Processed

NATURAL LANDS MANAGEMENT

NATURAL HERITAGE INDEX MAPS

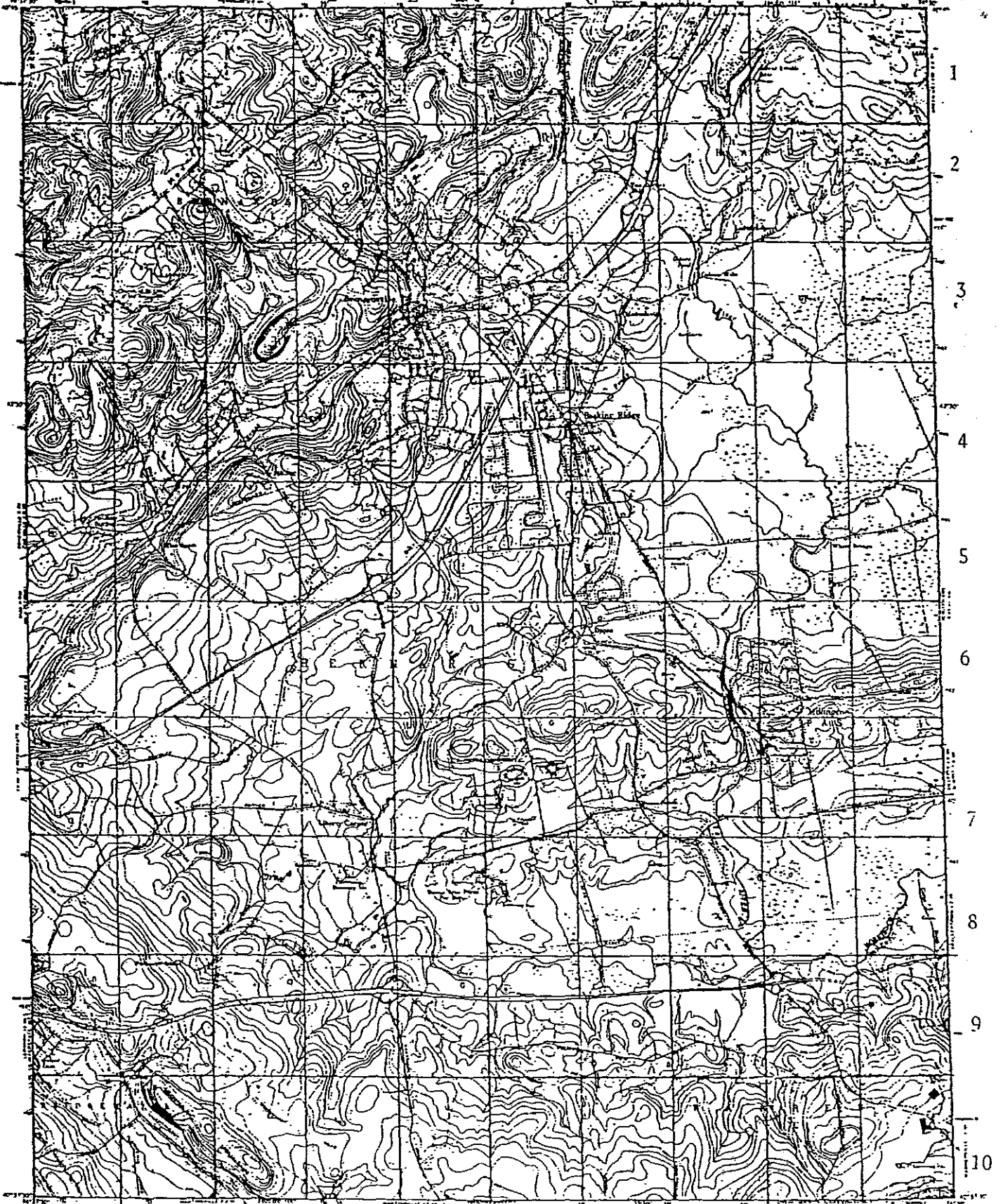
The Natural Heritage Database contains several thousand records of individual occurrences of endangered and threatened species and ecosystems. Many of these occurrences either have not been documented in recent years or have not had habitat boundaries delineated. Because much work remains to be done to delineate habitat boundaries and determine current status for these occurrences, Natural Heritage Index Maps were devised to red flag general areas in which the occurrences are located. The index maps are meant to be used as a tool to point to areas which may be of significance for endangered biological diversity. These maps do not depict all endangered species habitat in the state, but merely general areas which contain documented occurrences. Many additional areas may contain unidentified or poorly documented occurrences.

The maps have been produced using a computer generated grid which shades a grid cell approximately 330 acres in size if an endangered or threatened species or ecosystem has been documented anywhere within the cell. To use these maps, we suggest that you first find the location to be checked on the quad maps and then refer to the same grid location of the Natural Heritage Index Maps. The Natural Heritage Program can be contacted for additional information as specific projects are planned.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

UNITED STATES
DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS

BERNARDSVILLE QUADRANGLE
NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)



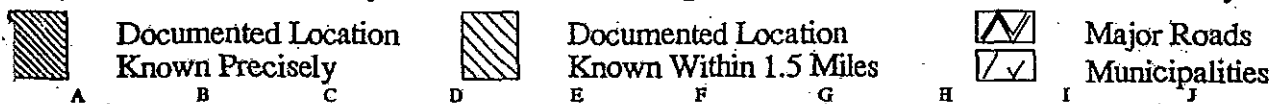
Revised by the Army Map Service
Examined and approved by the Geological Survey
Controlled by the Army Map Service
Photographic base: aerial photograph taken in 1942. First edition 1943.
Controlled by the Geological Survey 1944.
Map projection: 1927 North American Datum.
10,000 feet and lower contours are shown at 100-foot intervals.
100-foot contours are shown at 10-foot intervals.
Contours are shown at 10-foot intervals.
Contours are shown at 10-foot intervals.
Contours are shown at 10-foot intervals.
Contours are shown at 10-foot intervals.

SCALE 1:20,000
1 inch = 2,000 feet
1:20,000
1 inch = 2,000 feet
1:20,000
1 inch = 2,000 feet

ROAD CLASSIFICATION
Light
Heavy
V.S. Road
Bernardsville N.J.
1944
Photorevised 1970
This map is the property of the Army Map Service

Generalized Natural Heritage Index Map

Generalized Locations for Rare and Endangered Elements of Natural Diversity



NOTE: This is not a complete map of rare and endangered species habitat for this area. It reflects data on known occurrences compiled as of the above date. It includes both historically and recently documented habitat. Additional occurrences may be found on unsurveyed habitat. For more information, contact the Office of Natural Lands Management, CN404, Trenton, NJ 08625.

APRIL 1998
Updated semiannually

Elements so ranked are often restricted to very specialized conditions or habitats and/or restricted to an extremely small geographical area of the state. Also included are elements which were formerly more abundant, but because of habitat destruction or some other critical factor of its biology, they have been demonstrably reduced in abundance. In essence, these are elements for which, even with intensive searching, sizable additional occurrences are unlikely to be discovered.

- S2** Imperiled in New Jersey because of rarity (6 to 20 occurrences). Historically many of these elements may have been more frequent but are now known from very few extant occurrences, primarily because of habitat destruction. Diligent searching may yield additional occurrences.
- S3** Rare in state with 21 to 100 occurrences (plant species in this category have only 21 to 50 occurrences). Includes elements which are widely distributed in the state but with small populations/acreage or elements with restricted distribution, but locally abundant. Not yet imperiled in state but may soon be if current trends continue. Searching often yields additional occurrences.
- S4** Apparently secure in state, with many occurrences.
- S5** Demonstrably secure in state and essentially ineradicable under present conditions.
- SA** Accidental in state, including species (usually birds or butterflies) recorded once or twice or only at very great intervals, hundreds or even thousands of miles outside their usual range; a few of these species may even have bred on the one or two occasions they were recorded; examples include European strays or western birds on the East Coast and vice-versa.
- SE** Elements that are clearly exotic in New Jersey including those taxa not native to North America (introduced taxa) or taxa deliberately or accidentally introduced into the State from other parts of North America (adventive taxa). Taxa ranked SE are not a conservation priority (viable introduced occurrences of G1 or G2 elements may be exceptions).
- SH** Elements of historical occurrence in New Jersey. Despite some searching of historical occurrences and/or potential habitat, no extant occurrences are known. Since not all of the historical occurrences have been field surveyed, and unsearched potential habitat remains, historically ranked taxa are considered possibly extant, and remain a conservation priority for continued field work.
- SP** Element has potential to occur in New Jersey, but no occurrences have been reported.
- SR** Elements reported from New Jersey, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. In some instances documentation may exist, but as of yet, its source or location has not been determined.
- SRF** Elements erroneously reported from New Jersey, but this error persists in the literature.
- SU** Elements believed to be in peril but the degree of rarity uncertain. Also included are rare taxa of uncertain taxonomical standing. More information is needed to resolve rank.
- SX** Elements that have been determined or are presumed to be extirpated from New Jersey. All historical occurrences have been searched and a reasonable search of potential habitat has been completed. Extirpated taxa are not a current conservation priority.
- SXC** Elements presumed extirpated from New Jersey, but native populations collected from the wild exist in cultivation.
- SZ** Not of practical conservation concern in New Jersey, because there are no definable occurrences, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long distance migrants whose occurrences during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped and

protected. In other words, the migrant regularly passes through the state, but enduring, mappable element occurrences cannot be defined.

Typically, the SZ rank applies to a non-breeding population (N) in the state - for example, birds on migration. An SZ rank may in a few instances also apply to a breeding population (B), for example certain lepidoptera which regularly die out every year with no significant return migration.

Although the SZ rank typically applies to migrants, it should not be used indiscriminately. Just because a species is on migration does not mean it receives an SZ rank. SZ will only apply when the migrants occur in an irregular, transitory and dispersed manner.

B Refers to the breeding population of the element in the state.

N Refers to the non-breeding population of the element in the state.

T Element ranks containing a "T" indicate that the infraspecific taxon is being ranked differently than the full species. For example *Stachys palustris* var. *homotricha* is ranked "G5T? SH" meaning the full species is globally secure but the global rarity of the var. *homotricha* has not been determined; in New Jersey the variety is ranked historic.

Q Elements containing a "Q" in the global portion of its rank indicates that the taxon is of questionable, or uncertain taxonomical standing, e.g., some authors regard it as a full species, while others treat it at the subspecific level.

1 Elements documented from a single location.

To express uncertainty, the most likely rank is assigned and a question mark added (e.g., G2?). A range is indicated by combining two ranks (e.g., G1G2, S1S3).

ICATION CODES

es refer to whether the identification of the species or community has been checked by a reliable individual and is indicative of significant habitat.

Y Identification has been verified and is indicative of significant habitat.

BLANK Identification has not been verified but there is no reason to believe it is not indicative of significant habitat.

? Either it has not been determined if the record is indicative of significant habitat or the identification of the species or community may be confusing or disputed.

01 OCT 1998

SOMERSET COUNTY
RARE SPECIES AND NATURAL COMMUNITIES PRESENTLY RECORDED IN
THE NEW JERSEY NATURAL HERITAGE DATABASE.

NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
*** Vertebrates						
ACCIPITER COOPERII	COOPER'S HAWK		E		G5	S3B, S4N
AMBYSTOMA LATERALE	BLUE-SPOTTED SALAMANDER		E		G5	S1
AMMODRAMUS HENSLOWII	HENSLOW'S SPARROW		E		G4	S1B
AMMODRAMUS SAVANNARUM	GRASSHOPPER SPARROW		T/T		G5	S2B
ARDEA HERODIAS	GREAT BLUE HERON		T/S		G5	S2B, S4N
BARTRAMIA LONGICAUDA	UPLAND SANDPIPER		E		G5	S1B
BUTEO LINEATUS	RED-SHOULDERED HAWK		E/T		G5	S1B, S2N
CLEMYS INSCULPTA	WOOD TURTLE		T		G4	S3
CLEMYS MUHLENBERGII	BOG TURTLE	LT	E		G3	S2
DOLICHONYX ORYZIVORUS	BOBOLINK		T/T		G5	S2B
EURYCEA LONGICAUDA LONGICAUDA	LONGTAIL SALAMANDER		T		G5T5	S2
HIRUNDO PYRRHONOTA	CLIFF SWALLOW		T/S		G5	S2B
LYNX RUFUS	BOBCAT		E		G5	S3
MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER		T/T		G5	S2B, S2N
PASSERCULUS SANDWICHENSIS	SAVANNAH SPARROW		T/T		G5	S2B, S4N
POOECETES GRAMINEUS	VESPER SPARROW		E		G5	S1B, S2N
STRIX VARIA	BARRED OWL		T/T		G5	S3B

*** Ecosystems

CAVE AQUATIC COMMUNITY	CAVE AQUATIC COMMUNITY				G4?	S2.
CAVE TERRESTRIAL COMMUNITY	CAVE TERRESTRIAL COMMUNITY				G4?	S3
FLOODPLAIN FOREST	FLOODPLAIN FOREST				G4	S3?
TRAPROCK GLADE/ROCK OUTCROP COMMUNITY	TRAPROCK GLADE/ROCK OUTCROP COMMUNITY				G2	S1?

*** Invertebrates

ALASMIDONTA UNDULATA	TRIANGLE FLOATER				G4	S3
ALASMIDONTA VARICOSA	BROOK FLOATER				G3	S1
COMPHUS ABBREVIATUS	SPINE-CROWNED CLUBTAIL				G3G4	S?

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NAME	COMMON NAME	FEDERAL STATUS	STATE STATUS	REGIONAL STATUS	GRANK	SRANK
HESPERIA LEONARDUS	LEONARD'S SKIPPER				G4	S2S3
LAMPSILIS CARIOSA	YELLOW LAMPUSSEL				G4	S1
METARRANTHIS PILOSARIA	COASTAL SWAMP METARRANTHIS				G3G4	S3S4
*** Other types						
PRIMEVAL FOREST	PRIMEVAL FOREST				G3?	S1
*** Vascular plants						
ACER NIGRUM	BLACK MAPLE				G5Q	S2
AGASTACHE NEPETOIDES	YELLOW GIANT HYSSOP				G5	S2
ALISMA TRIVIALE	LARGE WATER-PLANTAIN		E		G5T5	S1
ASCLEPIAS RUBRA	RED MILKWEED			LP	G4G5	S2
ASTER INFIRMUS	CORNEL-LEAVED ASTER				G5	S2
ASTER PRAEALTUS	WILLOW-LEAVED ASTER		E		G5	S1
BOTRYCHIUM ONEIDENSE	BLUNT-LOBED GRAPE-FERN				G4	S2
BOUTELOUA CURTIPENDULA	SIDE-OATS GRASS		E		G5	S1
CALYSTEGIA SPITHAMAEA	ERECT BINDWEED		E		G4G5	S1
CARDAMINE ANGUSTATA	SLENDER TOOTHWORT				G5	S3
CAREX CRAWFORDII	CRAWFORD'S SEDGE				G5	S2
CAREX FRANKII	FRANK'S SEDGE				G5	S3
CAREX PALLESCENS	PALE SEDGE				G5	S2
CAREX WILLDENOWII	WILLDENOW'S SEDGE				G5	S2
CASTILLEJA COCCINEA	SCARLET INDIAN PAINTBRUSH				G5	S2
CERCIS CANADENSIS	REDBUD		E		G5	S1
CHEILANTHES LANOSA	HAIRY LIPFERN				G5	S2
CLEMATIS OCCIDENTALIS	PURPLE CLEMATIS				G5	S2
CRATAEGUS PUNCTATA	DOTTED HAWTHORN				G5	S2
CYNOGLOSSUM VIRGINIANUM VAR VIRGINIANUM	WILD COMFREY				G5T5	S2

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ELEOCHARIS TENUIS VAR VERRUCOSA	SPIKERUSH		E		G5T3T5	S1.1
MELANTHIUM VIRGINICUM	VIRGINIA BUNCHFLOWER		E		G5	S1
MUHLENBERGIA CAPILLARIS	LONG-AWNEED SMOKE GRASS		E		G5	S1
PHLOX PILOSA	DOWNY PHLOX		E		G5	SH
PLANTAGO PUSILLA	SLENDER PLANTAIN		E		G5	SH
POTAMOGETON ROBINSONII	ROBBIN'S PONDWEED		E		G5	S2
PTELEA TRIFOLIATA	WAFFER ASH		E		G5	S1
RANUNCULUS PUSILLUS	LOW SPEARWORT				G5	S2
RUDBECKIA FULGIDA	ORANGE CONEFLOWER		E		G5	S1
SAGITTARIA AUSTRALIS	SOUTHERN ARROW HEAD		E		G5	S1
SANICULA TRIFOLIATA	LARGE-FRUITED SANICLE		E		G4	S1
SCUTELLARIA LEONARDII	SMALL SKULLCAP		E		G4T4	S1
SELAGINELLA RUPESTRIS	LEDGE SPIKE-MOSS				G5	S2
SPIRANTHES LACINIATA	LACE-LIP LADIES'-TRESSES		E		G4G5	S1
SPOROBOLUS NEGLECTUS	PUFF-SHEATHED DROPSEED		E		G5	S1
STACHYS PALUSTRIS VAR HOMOTRICHA	MARSH HEDGE-NETTLE		E		G5T?	SH
TRIOSTEUM ANGUSTIFOLIUM	NARROW-LEAVED TINKER'S-WEED		E		G5	S1

65 Records Processed