

VIII. CONSERVATION AND OPEN SPACE PLAN ELEMENT

*“The purpose of conservation:
The greatest good to the greatest number of people for the longest time”*

Gifford Pinchot, US Forest Service

INTRODUCTION

In furtherance of the conservation objectives of the State Legislature, the Municipal Land Use Law (*N.J.S.A. 40:55D-1 et seq.*) provides for preparation and adoption of a Conservation Plan Element (*N.J.S.A. 40:55D-28b.8.*) as follows:

“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;”

STATUTORY AUTHORIZATION

This section of the Master Plan was prepared in accordance with the Municipal Land Use Law, N.J.S.A. 40:55D-28b:

(8) 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 systemically 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;

The MLUL authorizes municipalities to plan and zone to promote the general welfare of the citizens of New Jersey. The 15 purposes of the MLUL (NJSA 40:55D-2) explain the State’s rationale for the statutory authorization for municipal land use planning and regulation. Eight of these purposes highlight the importance of conserving natural resources and maintaining a clean healthy environment.

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1. The public health and safety (subsection “a”) bear a direct relationship to the use and management of New Jersey’s land and water resources.
2. Securing safety from floods and other natural and manmade disasters (subsection “b”) and providing adequate light, air and open space (subsection “c”) are similarly directed at conserving natural resources.
3. “Preservation of the environment”, in part through planning for “appropriate population densities and concentrations” (subsection “e”) is a key underpinning of local land use policy.
4. Providing sufficient space in appropriate locations for a variety of land uses is intended, according to their respective environmental requirements, to meet the needs of all New Jersey citizens” (subsection “g”).
5. The statute also seeks to promote the conservation of “open space, energy resources and valuable natural resources in the State and to prevent urban sprawl and degradation of the environment through improper use of land” (subsection “j”).
6. The conservation of energy is cited in subsection “n” (“promote utilization of renewable energy sources”) and subsection “o” (“promote the maximum practicable recovery and recycling of recyclable materials”).

The MLUL also provides for the preparation of a Green Building and Environmental Sustainability Plan Element (Green Plan Element), which is a separate but related element of the master plan.

GOALS AND OBJECTIVES

The following Master Plan Goals and Objectives are directly relevant to the Conservation and Open Space Plan:

1. To promote and encourage social comity, civic responsibility and neighborliness, which are key quality of life indicators in Bernards.
2. To promote sustainable practices in the design, construction and operation of public and private facilities.
3. To encourage an overarching respect for the natural environment and a desire to leave Bernards a better place as a result of these plans.
4. To retain the rural and agricultural character of the township to the greatest extent practicable.
5. To limit development to densities and intensities that can be adequately served by existing and planned private and municipal capital facilities and the natural

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and built infrastructure, and not purchasing additional wastewater treatment capacity to permit collection line extensions.

6. To limit development to densities and intensities that will retain the remaining natural areas of the Township and protect sensitive environmental areas.
7. To encourage the use of design techniques that result in energy and water conservation and minimize the impact of development on the everyday environment.
8. To promote the preservation of the Township's historic sites and districts.
9. To continue to examine, and when appropriate, amend the Land Development Ordinance, to assure flexibility and excellence of design.
10. To examine new design approaches such as lot averaging and other open lands conservation techniques to determine their applicability in Bernards.

OBJECTIVES

Land Use and Management

1. Land use policies should strive to maintain and enhance community character, protect the integrity of existing neighborhoods and prevent the intrusion of incompatible new development.
2. The densities and intensities of permitted development on the limited remaining vacant lands should respect the environmental capabilities and limitations of these lands and not exceed the capacity of the natural environment and current infrastructure
3. Groundwater aquifers and surface water quality and quantity should be protected, through the proper management of aquifer recharge areas, wetlands and their transition areas and fractured bedrock groundwater aquifers.
4. To plan for a reasonable balance among various land uses that respects and reflects the goals of the Master Plan.
5. Development densities and intensities should be planned at levels which will not require growth-inducing infrastructure to be extended into the rural countryside.

Conservation and Open Space

1. Environmentally sensitive land should be protected through acquisitions and/or conservation easements.
2. Recreational opportunities should be enhanced by construction of paths and expansion of greenways that better link neighborhoods with open spaces and

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natural lands.

3. Township-owned sites should be evaluated for potential active and passive recreational use with an emphasis on retaining natural lands wherever possible.
4. Open space acquisitions should be prioritized to meet evolving needs and current deficits and in concert with historic preservation objectives.
5. Bernards should continue to promote and enhance local stewardship of open spaces.

CONSERVATION PLANNING IN BERNARDS TOWNSHIP

Bernards contains a multitude of natural resources which together help define the essential character of the Township. The rolling landscape that surrounds the developed environment lends to a sense of place that should be fiercely protected; its vanishing would have a profound effect on the future character of the Township.



The rolling landscape of Bernards lends to its desirable sense of place.

Toward this end, since 2003 the Township has considered a series of ordinances addressing native species plantings and neighborhood tree conservation and has adopted minimum improvable lot area and density calculations based on natural resource limitations and other constraints.

This Conservation Plan proposes the continuation and expansion of Bernards' land stewardship efforts and outlines Bernards Township's strategies to meet the statutory purpose to preserve, conserve and utilize natural resources. Land stewardship involves the actions of both landowners and government agencies. The Township's approach to stewardship should be two-fold, including public education and implementation of ordinances for conservation subdivision designs, stormwater management, and protection of stream corridors, steep slopes, ridgelines and forests.

Public education on the importance of stewardship in protecting these valuable natural resources is available through existing educational programs offered by the County and State, and private non-profit organizations including the New Jersey Conservation Foundation, the Great Swamp Watershed Association and the Upper Raritan Watershed Association. The Township should seek to partner with these organizations to advance these efforts, and should explore the creation of new

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programs through Township schools and Township agencies such as Parks and Recreation or the Environmental Commission.

Sustainable Jersey, a statewide program to register and certify “green” municipalities, has outlined an agenda of environmentally friendly initiatives that municipal leaders can select from, when pursuing Sustainable Jersey certification. Sustainable Jersey is further described in the Green Building and Environmental Sustainability Plan (Green Plan).

While the Conservation Plan Element is designed to function in concert with the other plan elements, the most important linkage will be with the Land Use Plan. Together, these plan elements propose the location, scale and intensity of new development and the resource management strategies needed to protect the environment. By providing for development at densities that the land can support, the Land Use Plan effectively carries out the objectives of the Conservation Plan and vice versa.

This Master Plan reiterates the concern that retaining the existing zoning will overtax the natural environment, with substantial degradation of surface water and groundwater quality. It will also entail the removal of substantial forested areas, and farmlands, which are particularly vulnerable to suburban sprawl. It has become increasingly obvious that there are other alternatives available, and that zoning for sprawl does not protect the general welfare, but rather substantially degrades the environment and erodes the quality of life and human interaction.

Fragmentation and degradation of vegetation, land and water resources has been a byproduct of human activity. Woodlands, initially cleared for agricultural use, have given way to residential neighborhoods easily developed on these high, dry and usable soils. Water quality has been progressively altered and impacted by human activity.

The quality of the air we breathe and the water we drink determines the health of the human organism and all life forms. This Conservation Plan seeks to minimize further degradation of these resources for the 21st century and beyond. This plan recognizes the inherent limitations of our ability to disassemble the natural world and put it back together again. It argues in favor of a lighter touch on the land, one that is more respectful of natural systems, and that limits the resource commitments and impacts of human intervention. This calls for a systems approach to natural resource conservation, where interconnected natural systems are viewed as a collective resource, not a series of separate features.

The variety of biological species is an indicator of the health of an ecosystem. Maintaining biological diversity requires protection of critical habitat areas. While habitats of endangered or threatened plant or animal species are of special importance, threatened or endangered status may be transient. For instance, the

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great blue heron and bald eagle have been removed from the protected list, yet their critical habitats remain essential to their continued survival. Additionally, the extirpation of rare species removes elements from the food chain that help maintain ecological balance. The explosive deer population in New Jersey is but one example of the damage wrought when this natural balance is lost.

Protecting biodiversity requires the protection of terrestrial and aquatic habitats that are highly susceptible to degradation. Pristine waters cannot be maintained without protection of their watershed areas. Freshwater wetlands play an important role in filtering contaminants from the surface water and groundwater regime and, while protected by state statutes, are not immune from impacts that occur beyond the regulated areas. Similarly, prime forested areas, including mature stands of native species, are easily lost or damaged through fragmentation, a manmade impact that reduces bio-diversity.

The scenic wonder of ridgelines, slopes and ravines is only one aspect of the value of these natural features, without which certain species will not remain. Similarly, grassland habitats are essential to the nesting, feeding and breeding of a variety of grassland bird species, yet such areas are frequently lost to development. Land development should be arranged to maximize the conservation of substantial masses of critical habitat areas, by limiting the aerial extent of development and promoting conservation techniques targeted to these resources.

Aldo Leopold wrote in *A Sand County Almanac*: "A land ethic, then, reflects the existence of an ecological conscience, and this in turn reflects a conviction of individual responsibility for the health of the land. Health is the capacity of the land for self-renewal. Conservation is our effort to understand and preserve this capacity..."

THE HIGHLANDS REGIONAL MASTER PLAN

The New Jersey Highlands Council adopted a Regional Master Plan (RMP) for the Highlands in September 2008. The RMP divides the Highlands into two primary components - the Planning Area, where RMP policies are optional, and the Preservation Area, where conformance to the RMP is mandatory and must be completed by December 8, 2009.

Bernards Township is entirely within the Planning Area, where any local decision to conform to the RMP is optional. While there is no time line for Planning Area communities to "opt-in" to the RMP, making the standards of the RMP applicable in the Planning Area, Bernards Township has not adopted a resolution indicating an intent to conform to the RMP.

Ironically, capacity analysis and build out assessment, key elements that the RMP requires municipalities to perform, have long guided the Bernards Township Master

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Plan, particularly since 2003 when reductions in residential density were recommended in the proposed Conservation Residential Districts.

SUMMARY OF CONSERVATION FACTORS

Bernards Township possesses a number of unique natural resources. The greatest concentration of these is found at the periphery of the developed suburban core of the Township along the Passaic River to the east, the Dead River to the south and the Second Watchung Ridge, spanning the Township's entire southwestern border with Bridgewater and Bedminster Townships. The following paragraphs identify these resources and highlight their importance in the ecosystem.

TOPOGRAPHY

The topography of Bernards Township ranges from the higher elevations on the Second Watchung Ridge to the low lying areas of the Great Swamp and Dead River. Elevations are generally between 199 and 609' above sea level (see Figure VIII-1). The core of the Township is characterized by rolling terrain, with higher elevations on the surrounding ridges to the north and west.

The Second Watchung Ridge is part of the Watchung Mountains, extending westward from Millburn Township in Essex County. This topographic feature forms the southern and western borders of Bernards. The western border is a minor extension of the Watchung Ridge, which also serves as a gateway to the Somerset Hills, which fan out through Bernardsville Borough. There are two other distinct ridge features present, one in Basking Ridge running north to south and another south of Lyons Road running east to west. The latter is part of Long Hill, which extends from Chatham Borough to the eastern border of Bernards.

BEDROCK GEOLOGY

The topography of Bernards Township reflects the underlying bedrock geology, depicted in Figure VIII-2. The Preakness Basalt flows which formed the Watchung Mountains are evident on the southern and western borders, in a radial pattern evident in the Second Watchung Ridge. The Towaco Formation, which consists of fine-grained sand and siltstone, extends throughout the central portion of the Township. The Hook Mountain Basalt runs through the southern part of Basking Ridge, south of the railroad line. The Boonton Formation, spanning the northern half of the Township border with Harding, underlies the Great Swamp area. The Hook Mountain Basalt, which underlies Basking Ridge and the portion of Long Hill within

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Bernards Township, is a fine to coarse grained intrusion similar to the Watchung Mountains. The Boonton Formation is a fine grained sand, silt and mudstone.

Protection of groundwater resources requires, in part, that development impacts to aquifers are managed in a way that protects recharge areas. Recharge areas are areas where permeable soils and natural drainage patterns permit the infiltration of surface runoff into the underlying geologic structure. Protecting aquifer recharge areas requires limitations on impervious coverage, to limit the negative effects of contaminated stormwater and to assure that recharge areas remain open to infiltration. Adequate functioning of on-site septic systems is a major concern in this regard.

Figure VIII-3 depicts a series of “Conservation Factors” affecting Bernards Township, including streams, forests, wetlands, steep slopes and floodplains. This composite mapping highlights areas of the Township where sensitive resource limitations overlap or converge. These areas merit a high level of protection.

WATERSHEDS

The majority of Bernards Township (i.e., 88.4%, 21.4 square miles) is located within Watershed Management Area 6 (Upper & Mid Passaic, Whippany & Rockaway), as defined by the State Development and Redevelopment Plan (see Figure VIII-4). Small portions of the Township’s westernmost boundary are located within Watershed Management Area 8 (North & South Branch Raritan), and a small portion of the southern tip of the Township is located within Watershed Management Area 9 (Lower Raritan, South River and Lawrence).

All of the medium residential zones (R4, R5, R6 and R7) are located within Watershed Management Area 6, which itself consists of five subwatersheds, (1) Upper Passaic (above Osborn Mills); (2) Upper Passaic (Dead River to Osborn Mills); (3) Dead River (below Harrisons Brook); (4) Harrisons Brook; and, (5) Dead River (above Harrisons Brook).

SURFACE WATERS

Bernards Township has approximately 57 miles of streams and rivers, which are depicted on Figure VIII-3. The Passaic River forms the Township’s eastern border with Harding and Long Hill Townships and flows roughly north to south. The two other main flowing water bodies are Harrison Brook and the Dead River. Harrison Brook has its origins in the north-central portion of the Township, north of I-287, and flows south to its confluence with the Dead River. The Dead River originates in the northwestern corner of the Township, north of I-287, and flows south and east along the Township’s southeastern border where it then joins the Passaic River.

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Since 2003, NJDEP regulations have expanded controls over the streamside zone, with minimum 50' buffers on all streams.

FLOODPLAINS

Floodplains flank the streams and rivers that drain the Township, as depicted on Figure VIII-3. By far the most extensive floodplain is associated with the Passaic River in the northeastern portion of the Township. Most of the floodplain areas here are within the Great Swamp watershed and part of Lord Stirling Park, permanently protected as open space and recreation land. The floodplain in this area extends as far as 3000' from the Township border, and is variable in width. The Dead River also has an extensive floodplain within Bernards, major portions of which are encompassed within Township- owned lands directly south of Spring Valley Boulevard. With the exception of a few elevated areas to the interior of these properties, the floodplain extends to Spring Valley Boulevard.

Further north, where the Dead River flows from the northwestern corner of the Township, the floodplain is variable, ranging in width from 200' to 2500' at its widest point. Harrison Brook, flowing through the central portion of the Township, also has a variable width floodplain. As the brook flows south, its floodplain fans out further, reaching 1000' at its widest point. Altogether, floodplains total 2,200 acres and account for roughly 15% of the Township's acreage.

NJDEP Flood Hazard rules now set strict limits on building in the flood hazard area, prohibiting construction of basements and restricting construction of crawlspaces and garages unless their floors are more than one foot above the high water mark, as is also required for any new road. The rules also impose a 25-foot setback from any top of bank or edge of water for all new construction, or reconstruction of existing buildings, regardless of whether the site is located in a flood hazard area. And a "Zero Net Fill" requirement prohibits construction from covering more than 20% of the flood storage volume of a site and requires developers to remove fill to compensate for the flood storage volume reduced by the development.

Riparian Zones are subject to NJDEP Flood Hazard Area regulations that require permits for construction, filling or clearing land within either 50 feet, 150 feet or 300 feet of a watercourse, depending upon its environmental sensitivity, with very limited circumstances under which vegetation in the Riparian Zone may be disturbed or removed.

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WETLANDS

Wetlands within the Township account for approximately 20% of the total land area of Bernards. Many of these wetlands correspond to the floodplains of the three major rivers and streams of the Township; however, there are wetlands in various locations that are part of the greater hydrologic system as depicted on Figure VIII-3. The largest concentrations of wetlands occur in the vicinity of Lord Stirling Park/Great Swamp, and along the Dead River floodplain, south of Spring Valley Boulevard. Wetlands within Bernards play an important role in filtering contaminants as well as retaining precipitation and slowly feeding it to headwater streams.

STEEP SLOPES

Steep slopes occur in various locations throughout the Township (see Figure VIII-3), but are primarily found along the Second Watching Ridge on the Township's southern and northwestern boundaries. Slopes greater than 15% are also found along the extension of Long Hill in the very center of the Township south of Basking Ridge and in the northernmost part of the Township in the vicinity of Hardscrabble Road. Bernards currently regulates slopes over 15% and requires detailed grading plans and architectural plans.

FORESTED AREAS

Despite the substantially developed character in north/central Bernards, the western and southern portions of the Township retain large contiguous forests, many of which are permanently preserved as parks and open space. The more developed portion of the Township has spotty forested areas, primarily found on remaining undeveloped parcels and along stream corridors. Roughly 28% (4,360 acres) of the Township remains forested.



Approximately 28% of Bernards Township remains forested.

Forests provide a wide range of benefits, improving air quality, aiding aquifer recharge and preventing soil erosion. Most of the forests in Bernards also provide critical habitat for endangered and threatened species (see next section on Critical Habitat). The preservation of this forest cover is not only of critical importance to the perpetuation of these species, but also to the rural character of the district.

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The NJDEP publication titled “Protection and Care of Urban Forests” provides a detailed list of the resources protected and offered by forested areas. It notes that forests:

- Modify local climatic conditions near or within their boundaries
- Create the feeling of privacy
- Serve as recreational facilities
- Provide habitats for plants and animals
- Reduce surface runoff because of the high moisture holding capacity of the forest soils and tree canopy
- Enhance the visual characteristics of the scenic corridors
- Reduce noise pollution
- Produce oxygen

CRITICAL HABITAT FOR THREATENED AND ENDANGERED SPECIES

In 1993, the New Jersey Department of Environmental Protection Endangered and Non-game Species Program (ENSP) initiated a move to a landscape level approach for endangered species protection. With suburbanization and development occurring in all areas of the State, an increasing amount of habitat suitable for threatened and endangered species was being lost daily.

In order to address habitat loss, ENSP partnered with the Center for Remote Sensing and Spatial Analysis (CRSSA) at Cook College, Rutgers University. Utilizing LandSat Thematic Mapper satellite imagery, CRSSA mapped land cover for the entire State of New Jersey, broken down into 20 different habitat/land cover types. After generalized cover types were classified, detailed methodologies were developed to address the habitat suitability issues for each focus category, including beach/dunes, emergent landscapes, forested wetlands, forested areas and grasslands.

After reclassifying data based on standards developed for each focus category, the habitat data was intersected or combined with the Natural Heritage Program’s Biological Conservation Database (BCD). This database is a Geographic Information System (GIS) coverage that provides information on the sighting of threatened and endangered species, based on the field work of ENSP scientists and sightings reported by members of the public. It is the most comprehensive data available in digital form on the location of threatened and endangered species.

The combination of these two data sets resulted in the data depicted on Figure VIII-5. The Landscape Project data provides users with scientifically sound, peer-reviewed information on the location of critical habitat based on the conservation

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status of the species that are present. Habitats are ranked on a scale of 1 to 5, based on the criteria outlined in the following table:

NJ Landscapes Project Ranking System

| Rank | Indication |
|------|--|
| 1 | Suitable habitat, no special concern, threatened or endangered species sighted |
| 2 | Habitat patch with species of special concern present |
| 3 | Habitat patch with State threatened species present |
| 4 | Habitat patch with State endangered species present |
| 5 | Habitat patch with Federal threatened or endangered species present |

Bernards Township is rich in habitat that is suitable to support populations of threatened and endangered species. Many of the forest and wetland/forest resources that are present in the Township are ranked 3 and 4, indicating the presence of State Threatened and State Endangered species. Approximately 68% of the Township's forest resources are Rank 3 while the remaining 32% are Rank 4. Roughly 32% of the wetland/forest resources are Rank 3 with 45% Rank 4. In addition to these high quality habitats, there are also grassland and emergent habitats present within the Township.

While forest is the most extensive habitat found in the Township, the wetland/forest habitat is the most critical. There are roughly 730 acres of Rank 4 wetland/forest habitat, primarily within the floodplain of the Passaic River in Lord Stirling Park and along the corridor of the Dead River in the eastern part of the Township. The critical forest habitat of Bernards Township stretches along the southern boundary of the Township with Bedminster and Bridgewater, wrapping around to the eastern boundary with Far Hills and Bernardsville. Some of the critical forest resources also extend north along the Dead River and Harrison Brook corridors.

Bernards Township also has critical emergent and grassland habitat. Although not as high ranking as much of the forest and wetland/forest habitat, it nonetheless is worthy of noting. Emergent habitats are those that are critical to the reproduction of many amphibian species, which occur on these early spring pools for this process. The NJDEP is currently undertaking a project to identify and monitor these emergent habitats, with the hopes of giving them the same protection that wetland areas are afforded under State legislation. Rank 1 and Rank 2 emergent habitats are located along the Passaic and Dead River floodplains and total approximately 640 acres. The grassland habitat depicted in Figure VIII-5 is primarily rank 3, with small areas of rank 1 present as well. Grassland resources are concentrated near Lord Stirling Park, the southern tip of the Township and along the eastern border of the

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Township near Far Hills. There is a total of 664 acres of grassland habitat in the Township.

The Landscape Program data was intended to aid municipalities, County and State governments, conservation agencies and citizens by identifying the extent of critical habitat within their respective jurisdictions and communities. A variety of means should be employed to protect these critical habitats, including the following:

- Prioritizing open space acquisitions based on the presence of habitat for threatened and endangered species
- Adopting regulations aimed at protecting critical habitat
- Adopting management policies for open space that are consistent with protection of critical habitat
- Permitting flexibility in development techniques to protect critical habitat
- Promoting land stewardship practices that are consistent with the protection of critical habitat

More than half of the land area in the Township is categorized as critical habitat for threatened and endangered species, whether it's forest, grassland, emergent or forested wetland. The Landscape Project data highlights the extent and critical nature of these resources found within Bernards Township.

CARRYING CAPACITY

Carrying capacity is a planning technique used to establish the maximum population level of a species based on the availability of natural resources. Carrying capacity had its genesis in ecological studies, used to manage wildlife habitat rangeland for grazing. In the context of land use planning, carrying capacity has been defined as the ability of natural and man-made systems to support a level of population growth and ancillary development while maintaining established standards of performance. When applied to land use planning, an assessment of carrying capacity is useful in establishing maximum densities or intensities of development. However, sustainability requires a margin of safety, not planning for the maximum development that can be supported.

The policies and strategies of this Conservation Plan seek to limit the impacts of development and retain the natural terrain and features to the greatest extent practicable. This plan also promotes the restoration of natural systems that have been degraded by past activities. As new regulatory tools or techniques become available, they should be evaluated for their ability to promote the Conservation Plan objectives and adopted where appropriate. Conservation easements for critical resources should be expanded, and a program of mapping and monitoring instituted. Additionally, open

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space and woodlands acquisition priorities should support the goals of the Conservation Plan.

Since the preparation of the 2003 Master Plan, Bernards retained Matthew Mulhall, PG to prepare a groundwater evaluation ("Evaluation of Groundwater Resources of Bernards Township, Somerset County, New Jersey" 2008) that has again called attention to the need for lower development densities in unsewered areas to protect groundwater from septic contamination.

The groundwater management strategy from the 2003 Master Plan in the proposed CR-1 and CR-2 Districts seeks to limit the degradation of groundwater while also permitting appropriate uses of land. The Plan seeks to program uses of land that can conserve and manage limited resources, while also permitting development at densities that limit degradation and serve to better protect the potability and availability of groundwater resources. New DEP septic density standards may require a further evaluation of the minimum lot criteria needed to meet this state mandate.

DEP regulations require a 300' buffer for all Category 1 streams and their tributaries and 50' to 150' buffers on other waters. As a result, Bernards should amend and update stream corridor regulations to reflect all current DEP buffer standards. Bernards includes some high quality stream segments in the northern portion of the Township, including trout production waters, and streams in the Township that are headwaters to the Dead River and Harrison's Brook, which flow to the Passaic River. Headwaters are particularly vulnerable to degradation because of the limited available flow, and any degradation in headwaters is transferred downstream throughout the surface water system.

In unsewered areas, Bernards Township's Master Plan proposes to achieve the objectives of the State Plan through zoning techniques that avoid sprawl. A key Mulhall finding (page 69) calls attention to the need for adequate recharge areas to dilute septic system contaminants:

Within the small portion of the township underlain by Precambrian rocks, recharge areas open to infiltrating precipitation ranging from 9.3 to 12.9 acres are necessary to ensure adequate recharge is available to dilute septic system contaminants that migrate into bedrock aquifers in this area. Given the very low replenishment rate of the Preakness Basalt, if septic system contaminants migrate into the same fractures used for water supply, recharge to the equivalent of 23 to 67 acres will be necessary to adequately dilute the nitrates in these discharges to the current antidegradation level. Within

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the slightly more than 2400 acres underlain by the Jurassic sedimentary rocks, recharge to 7.3 acres will be necessary for diluting nitrates in septic system discharges to a concentration of 5.8 mg/l.

Thus, Mulhall concludes that the minimum recharge areas per septic system for the aquifers that underlie the proposed CR-1 and CR-2 Districts are generally comparable to or in excess of the 7-acre and 10-acre minimum lot criteria recommended in the 2003 Master Plan. Both the DEP septic density standards and the Mulhall study corroborate the 2003 Master Plan recommendation to reduce residential densities in non-sewered areas.

SUMMARY OF CONSERVATION PLAN POLICIES

ENERGY AND AIR QUALITY

Protection of air quality is a measure difficult for individual municipalities to control given that most impacts to air quality come from outside the region. The combination of coal burning power plants and industry to the west in the Ohio Valley along with prevailing wind directions create the greatest impact to air quality in our region.

Promoting sound principles will aid in reducing further effects on local air quality and maximize energy efficiency and use of alternative technologies. To effectuate this, the following measures are recommended:

- a. Promote alternative means of transit by providing opportunities and access for alternative transportation systems (buses, car and van pooling, bicycling, and walking).
- b. Reduce the need for vehicular trips by facilitating better connections among residential, commercial, office, and recreational uses.
- c. Encourage staggered work hours for large employment centers.
- d. Encourage energy conservation through subdivision design, building design and building orientation to maximize passive solar gain.
- e. Recommend landscaping standards that provide buildings with maximum solar access, shading, and wind protection.

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- f. Encourage the maximum recovery of recyclable materials and the use of renewable energy sources.
- g. Require air quality assessments at principal intersections for significant developments (three hundred (300) or more vehicle trips per day) to identify problem areas and mitigation strategies.
- h. Design and encourage bikeways, pedestrian walkways and other routes, where appropriate, to maximize opportunities for non-motorized travel in existing and new development.
- i. Encourage the use of alternative energy technologies, such as active solar collection for electricity or passive solar space heating, and recommend ways to accommodate these features without negative neighborhood visual impacts.

The Conservation and Open Space Plan functions in tandem with the Green Plan Element, which should be consulted for the full range of energy conservation, sustainability and green building strategies.

FOREST RESOURCES

Woodlands serve a number of important functions in the ecosystem. The most basic is the production of oxygen through the assimilation of CO₂; this is critical to the survival of both humans and animals, and gives forests an undeniable intrinsic value and indicates the need for their conservation. Forests are also excellent filters for surface runoff, reducing runoff volume and providing valuable recharge areas for groundwater. Woodlands are the primary habitat areas for a number of plant and animal species, some of which are threatened or endangered. Forests also play an important role in regulating climate, providing shade for water bodies and cooling the environment. Removal of trees and other vegetation results in ecological, hydrological, and economic impacts.

Aside from ecological benefits, woodlands and other native vegetation also provide visual diversity in the terrain. They enhance property values and contribute to the latent value of open space and recreation amenities, making them more attractive places within the community.

The following approaches are recommended to preserve, protect and improve the forest resources in the Township.

- a. A woodland conservation plan should be required as part of any application for development where critical forest resources have been identified. This plan should include identification of the floodplain, mesic and upland forest

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- stands on the tract and should be a primary consideration in the arrangement of development.
- b. Performance standards should be established limiting the extent of forest removal, based on the quality of the forest type. Priority wooded areas for preservation include unique forest types, woodlands adjacent to public water supply tributaries, habitats critical for endangered and threatened species, specimen trees, large wooded patches, 100-year floodplains, wetlands, stream corridors, and slopes of 15 percent or greater.
 - c. Performance standards should be developed to encourage the preservation of habitat areas that are as large and circular as possible, gradual and undulating at the edges and connected by wildlife corridors wide enough to maintain interior conditions (i.e. 300' or more).
 - d. Hedgerows and forest areas along traveled roadways and established property boundaries should be retained and enhanced, where appropriate, with native species. This is especially important on roadways identified in scenic roadway studies. These naturalized features also serve as buffers, providing separation between residential and commercial and industrial areas.
 - e. Existing and proposed greenways should promote and preserve existing woodland corridors to the greatest extent possible. This is especially important where greenways are proposed along stream corridors.
 - f. Reforestation and afforestation of open spaces through the use of native species should be required to enhance habitat, promote recharge and reduce surface runoff, erosion and flooding.
 - g. A construction mitigation plan, which minimizes construction-related impacts on woodlands, should be required prior to disturbance of more than 10,000 square feet of woodlands.
 - h. Reduced residential densities and the use of creative development techniques such as clustering, lot averaging and non-contiguous clustering provide the ability to protect valuable forest resources identified in the Township. Flexibility in design allows development to occur in a manner more consistent with conservation goals and objectives.

GROUNDWATER

The groundwater resources of the Township provide potable water to many of the Township's rural areas. Groundwater also provides base flow to rivers and streams

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during low flow periods. In order to protect and maintain this critical resource, it is recommended that the Township consider the following activities:

- a. A program should be established, or coordinated with an existing County or State program, to ensure that existing septic tanks are regularly pumped and maintained in a manner similar to the revised State Health Code standards for new systems.
- b. Ongoing public education should be directed at water conservation and preventing the discharge of toxic and hazardous pollutants to groundwater.
- c. The Environmental Commission, in conjunction with the Health Department, could conduct an environmental audit of groundwater quality, including an analysis of existing groundwater samples and an identification of existing facilities, which could adversely impact groundwater. Among the facilities that should be mapped and inventoried are the following:
 - (1) Underground storage tanks.
 - (2) Gas, fuel, and sewer line locations.
 - (3) Large septic systems for commercial/industrial users.
 - (4) Permitted community septic systems.
 - (5) Hazardous substance storage areas and facilities.
 - (6) Permitted NJPDES groundwater or surface discharge facilities.
- d. The Township should consider a wellhead protection program to protect community water supply systems and areas in the Township with clusters of residential wells that might be threatened by inappropriate land uses.
- e. Stormwater management ordinances should encourage the implementation of best management practices (BMP's) that promote water quality objectives and the recharge of groundwater supplies. Infiltration and water quality basins should be required with new development to the greatest extent practical.
- f. Residential densities in unsewered areas should be reduced as originally recommended in the 2003 Master Plan and subsequently highlighted in the Mulhall report and the new DEP septic density standards. These changes are important to protect the potability of groundwater from the impacts of septic systems.
- g. Landscaping standards should require the use of native and locally adapted plants, and designs, which minimize irrigation, maintenance and turf areas and require mulches to preserve soil moisture.

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- h. Irrigation systems for lawns and landscaping should be curtailed or eliminated in new developments and drip irrigation for localized watering should be encouraged.
- i. The Township should evaluate alternative well testing methodologies in order to assure that groundwater availability is accurately analyzed. Test wells installed as part of a groundwater availability analysis should also be tested for potability.
- j. The Township should relate the intensity of permitted development to conservative estimates of i) available water resources and; ii) the ability of the soil and ground water to sustain on-lot disposal systems without degrading or impairing surface or ground water quality.
- k. Limit impervious cover to foster maximum recharge and sustainable yields in the district and regional watersheds dependent on groundwater supply.

SCENIC RESOURCES

Our “sense of place” is inextricably linked to the views we encounter as we travel along local roadways and rivers. Our perceptual experience of landscape is a dominant element in our perceived “quality of life.”. The protection of scenic vistas, particularly those seen from public rights-of-way, serves to maintain the sense of place that exists within the Township. The Planning Board, as the agency carrying out development review, is the most appropriate agency to promote the maintenance of existing scenic resources within Bernards.

The Municipal Land Use Law (N.J.S.A. 40:55D-1 et seq.) provides a basis for such scenic character concerns, within the purpose, “to promote a desirable visual environment through creative development techniques and good civic design and arrangements” (N.J.S.A. 40:55D-2i). This purpose has particular relevance in subdivision and site plan review. The issue of scenic resource protection is also highlighted in the State Development and Redevelopment Plan (SDRP), which advances scenic resources management strategies.

Identifying Scenic Resources and Corridors

Landscapes are composed of groups of natural and man-made elements that combine to create a specific landscape character. The natural elements of landscape include:

1. *Physical features:*
 - Valley
 - Hills
 - Plains

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- Ridgelines
- High points
- Elevation changes
- 2. *Hydrographic features:*
 - Ponds
 - Lakes
 - Streams
 - Swamps
 - Marshes
- 3. *Vegetative features:*
 - Fields (natural, agricultural, cultural open spaces)
 - Forests
 - Hedgerows along fields
- 4. *Cultural or man-made elements:*
 - Roads (paved/unpaved; primary/secondary)
 - Structures (buildings and monuments)
 - Stonewalls and fences
 - Land use patterns

The observer's position in the landscape shapes the interaction with the scenic resource, which in turn shapes the perception of visual beauty. In general, the distance to the landscape scene increases the observer's visual focus shifts from details and particular features to forms and patterns.

Management Considerations

Standards should be established for the review of subdivisions and site plans that take into consideration the features that establish roadside and distance views. The following issues should be considered.

- a. *Roadside Views:*
 - Vegetation management
 - Clearing to promote visual penetration.
 - Planting to shield development
 - Selective cutting to maintain corridor
 - Access points for local streets
 - Utilize natural breaks
 - Subdivision configuration
 - Maintain stone rows and hedgerows
 - Utilize forested areas as backdrops
 - Shield development via street design
 - Arrange home sites to protect open fields
- b. *Distance Views:*
 - Location of development

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Foreground or midground of hillsides, away from ridge lines
Behind visual barriers
No higher than tree line
Street alignment
Follow hedgerows and stone rows
Screening material consistent with existing topography and native vegetation

Bernards Township has a wealth of scenic character elements, as a drive through the Township will confirm. Stone House Road, one of the more scenic thoroughfares, is a good example of a scenic roadway that may merit protection. The Township should develop a methodology for identification of scenic corridors in Bernards Township and priorities for conservation of those particularly scenic areas that merit special treatment.

The Somerset County Planning Board prepared a study of Scenic Corridors and Roadways (July 1992) that developed a rating system for scenic corridors and roadways. According to the County, scenic corridors have an area of influence that extends beyond those lands that border the roadway to include the entire landscape, while scenic roadways focus on the visual foreground at the edge of the roadway.

The County study suggests that while the State Development and Redevelopment Plan espouses worthy objectives relative to scenic corridors, "... the State Plan has not provided practical guidance on how to implement these policies." The County Planning Board suggests that "... use of an objective rating system ...lend credibility and support to a scenic roads program and thereby shield the municipality from court challenges."

The County developed designation criteria to allow an objective evaluation of candidate roadways. A rating system was developed to establish the relative scenic merits of various roadways, and all appropriate County road segments were analyzed. These designation criteria included positive features (vegetation, landscape composition, road characteristics and structures or historic districts); and negative features (landscape "scars" such as quarry sites or utility lines, structures such as junkyards, car lots or storage tanks and "other features such as high traffic volumes, litter, and landscape manipulation).

The County also suggests that municipalities utilize the master plan, zoning ordinance and site plan and subdivision standards to enhance scenic resource protection. Master plans should coordinate circulation, conservation and historic preservation plan policies with scenic resource protection goals. Site plan and subdivision standards may have the greatest role in protecting scenic qualities since they can control the siting of buildings, lots and roads.

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Specific road design and maintenance standards are recommended by the County including standards for cartways, bridges and culverts, curbing and drainage, guide rails, vehicle limits, intersection treatments, landscaping, lighting and signage. The County also cites mitigation strategies, including landscape management plans and lighting and signage controls.

The Township should pursue the following activities to develop a program for the protection of scenic resources:

- a. The scenic resources of the Township should be identified and ranked according to the combination of elements present and proximity to the public way.
- b. Design standards should be developed for different categories of attractive views, including enclosed roadside views, extended roadside views, and distance views.
- c. Significant ridgelines in the Township should be identified and offered protection through the Land Use Ordinance. This could include a ridgeline protection section which defines ridgelines and offers measures to buffer them from residential development.
- d. Design standards should be incorporated into the Township's subdivision and site plan process, in order to guide the location and configuration of development to protect scenic corridors and viewsheds.
- e. Enhanced setback standards should be established to limit the intrusion of new development along scenic roadsides.

STEEP SLOPES

Development on steep slopes has far reaching impacts. Clearing of trees and disturbance in steep slope areas leads to soil erosion and sedimentation of streams and water bodies, even with strict protective measures in place. A number of the steep slope areas in the Township occur on the banks of streams and rivers, where there is a significant threat of environmental damage if these slopes are disturbed. To avoid impacts due to disturbance and clearing of steep slopes, the following are recommended:

- a. Strict adherence to development standards limiting the extent of disturbance to slopes greater than 15%, and requiring individual lot grading plans where disturbance is permitted.

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- b. Develop land use strategies which allow parcels to be developed utilizing lot averaging and clustering techniques, to avoid disturbance and clearing of trees on steep slopes.
- c. Steep slopes have been included in the natural resource deductions contained in the Land Development Ordinance.

STREAM CORRIDORS

With nearly 57 miles of streams and rivers in the Township, protection of stream corridors is critical. Many streams and rivers form municipal boundaries, suggesting a need for cooperation at an inter-municipal level. Protecting the integrity of the stream corridor will lessen impacts to water quality. To this effect and to protect stream corridors from development impacts, the following management approaches are recommended:

- a. Vegetated buffers should be maintained along all stream corridors in the Township. Where past land use practices have resulted in the removal of trees along stream corridors, management practices should include the reestablishment of tree cover. Stream buffers should extend at least 95' from each side of the stream centerline.
- b. A stream corridor protection program should be developed and implemented which seeks to protect the stream corridor and adjacent wetlands, floodplains, and contributory uplands with steep slopes. The program established by the Delaware and Raritan Canal Commission provides a valuable model.
- c. Management strategies and monitoring standards should be developed for stream corridor areas.
- d. Bernards and neighboring municipalities should develop consistent and/or compatible management strategies along stream or river corridors.
- e. Floodplains have been included in the natural resource deductions contained in the Land Development Ordinance.

SURFACE WATER

Surface water is impacted by both point and non-point source pollution. Non-point source pollution, a major factor affecting Bernard's surface waters, should be mitigated by local land use strategies and management approaches. Non-point

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source pollutants include septic system effluent, agricultural runoff, stormwater runoff, and construction activities. In order to mitigate potential impacts to the Township's surface waters, the following management approaches are recommended:

- a. Water quality Best Management Practices (BMP's) should be adopted or refined, to protect the quality of surface waters and promote maximum habitat values. These include:
 - Arrange development on the least porous soils, to promote infiltration and reduce sediment and pollutant loading,
 - Buffer strips and techniques to maximize overland flow, such as grassed swales and filter strips,
 - Regional stormwater management approaches and extended detention facilities,
 - Wet ponds (retention basins) and wetland or marsh creation,
 - Infiltration practices to detain runoff, including trenches, basins, drywells and other structural solutions, and
 - Water quality inlets and oil/grit separators.
- b. Reductions in permitted residential densities and impervious coverage should be considered to reduce the potential impact to surface waters from non-point source pollution.

THREATENED AND ENDANGERED WILDLIFE SPECIES

With 50% of the Bernards Township land mass categorized as habitat suitable to threatened or endangered species, it is important to protect this habitat from further degradation and promote species diversity. Toward this end, it is recommended that the Township pursue the following actions:

- a. An ongoing inventory of threatened and endangered species, combining the records of the Natural Heritage Database with local sighting records should be developed and maintained.
- b. Alternative development options should be developed to aid in the preservation of critical habitat for threatened and endangered species should be studied. Techniques such as clustering and lot averaging,

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along with conservation easements, should be used to protect habitat areas with a landowner's utility of his or her land.

- c. The Township should develop a list of habitat requirements for endangered species.
- d. The Township should promote the potential re-establishment of habitat on open space lands while also protecting existing habitat through open space purchases.
- e. Reductions in permitted residential density will help to preserve critical habitats.

WETLANDS

Although wetlands are regulated at the State and Federal level, it is important for the Township to remain involved in the conservation of these areas. This is especially important as conservation easements are routinely granted through the development review process. Most of the wetland delineations and conservation easements required in the last few years have been converted to digital data, making management of these areas easier. Given the availability of this data, a system to periodically monitor and enforce conservation easement restrictions should be developed.

- a. Wetlands and wetland transition areas required by the New Jersey Freshwater Wetlands Protection Act have been included in the natural resource deductions contained in the Land Development Ordinance.
- b. Permitted development should be arranged to avoid all significant wetlands, and when road crossings are unavailable, they should be located at the point of minimum impacts.

LIGHT POLLUTION

While development continues at a rapid pace throughout New Jersey, lighting and light pollution become increasingly critical issues. The State Development and Redevelopment Plan recommends that "In the interest of improved safety, energy conservation and maintenance of environmental integrity, outdoor roadway and area lighting should be designed, installed and maintained to minimize misdirected and upward light and optimize the use of the lighting system."

This issue led the New Jersey Legislature to form a panel of experts to study the problem of light pollution and to advise the Legislature as to the severity of the problem and recommend legislative or administrative measures to alleviate it.

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In 1996 the Light Pollution Study Commission (LPSC) filed its report with the Governor and the Legislature. The LPSC recognizes Light Pollution as a problem and provides the recommendations and actions of its report to the Governor and the Legislature for their information and further consideration. While most of the recommendations pertained to State agencies there are a number of recommendations that are appropriate to local governments and particularly to Bernards Township and its rural character.

Some of the recommendations to be considered are:

1. Nationally recognized lighting recommendations for illuminance levels and uniformity ratios should be followed, such as contained in the Illuminating Engineering Society of North America (IESNA) Lighting Handbook.
2. Architectural and sign lighting should be designed to minimize light that does not illuminate the target area.
3. Lighting of building exteriors should be minimized or eliminated during those hours when it is not needed. Lighting controls (such as timers, dimmers, motion sensing devices, and photo sensors) should be encouraged.
4. Areas of New Jersey determined to be especially suitable for astronomical observations or which provide nocturnal benefits to flora and fauna should be considered for designation as "dark areas." A "dark area" is an area in which lighting is prohibited or limited in order to 1) address concerns regarding Light Pollution which impact the environment and 2) restore a more natural view of the starry sky.

In 2001 Clinton Township received the Hunterdon County Planning and Design Award for its "light pollution ordinance." This was a voluntary action on the part of the Township evolving from a perceived need to protect the night sky by fostering good design and safety in lighting. The Township addressed non-mandatory suggestions from the public and quasi-public agencies such as the New Jersey Light Pollution Study Commission and the New Jersey Astronomical Association. It also retained an expert on light pollution.

Bernards Township shares the night sky with New Jersey and its neighboring municipalities. It should therefore consider instituting strict controls on lighting design and incorporating them into the Land Development Ordinance.

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NEIGHBORHOOD DESIGN ALTERNATIVES

While Bernards has a wide range of housing types and no shortage of multiple family units, the build out of remaining lands is of considerable concern for its potential impact on neighborhood character, water resources and flora and fauna. The opportunity to meet multiple objectives above can sometimes be better served by offering alternatives to traditional subdivision design standards. A recent example of an alternative subdivision approach in Bernards that offered multiple conservation benefits is a neighborhood that received approval on Mine Brook Road. In this case, homes were placed in such a manner that expansive wetland buffers and open agricultural lands could remain along with the permitted residential development.

Bernards should consider employing conservation overlay zoning where specific environmental objectives could be better served than with conventional zoning.

OPEN SPACE CONSIDERATIONS

The Township's goal of developing an open space system, including linear corridors along rivers and brooks, continues to be realized. The preservation of parks and open space advances the Township's conservation goals while providing active and passive recreation amenities for Township residents. Open space preservation provides a number of benefits, including protection of flood prone and wetland areas from development and disturbance, maintenance of contiguous wildlife habitats adjacent to rivers and streams and preservation of the natural environment. Open Space and Conservation Areas are depicted in Figure VIII-6 and listed in Table VIII-1.



Open space preservation advances both conservation and recreation goals.

The creation of linear corridors along rivers and streams also provides an access link between parks, schools and the residential neighborhoods throughout the Township, promoting goals of both the Circulation Plan Element and the Parks and Recreation Plan Element. Figure VII-1 in the Parks and Recreation Element depicts the location of potential open space corridors and greenways. This Conservation and Open Space Plan is designed to work in conjunction with the Parks and Recreation Plan and the Circulation Plan to promote connectivity between open space and recreational facilities through non-vehicular travel using greenways and bikeways.

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The Planning Board should encourage the use of a variety of land development techniques in the Land Use Ordinance to encourage the preservation of open space and further the creation of a cohesive network of recreation amenities. The Planning Board should encourage the establishment or preservation of open space areas that provide linkages to existing parks and recreation facilities, as outlined in the Recreation Plan. The Township Committee has the ability to expand on the Planning Board's initiatives by providing capital funding for the purchase of property in fee simple, purchase of access and conservation easements from existing developed lands and creation of trails and other recreation amenities. The Township should continue to assess lands for recreation potential as they become available, regardless of the zoning district in which they are located.

Somerset County continues to promote the creation of a municipal park system along the Second Watchung Ridge and the Dead and Passaic Rivers. These areas of the Township, along the border of Bridgewater and Bedminster Townships (Second Watchung Ridge) and along the border of Warren Township (Dead River) and Harding and Long Hill Townships (Passaic River), are proposed open space corridors in the Parks and Recreation Plan Element. The Township and County have significant land holdings along the two river corridors and the Township is encouraging expansion of its holdings through this plan element. The Land Use Plan recommends reduced residential densities in the area of the Second Watchung Ridge, which will allow buffering of the Ridge from development. Cluster subdivision regulations are a valuable tool, which can protect critical lands as open space.

The Great Swamp Watershed is a valuable regional resource shared by the ten towns, which surround it, including Bernards Township. The Township currently participates in the efforts of the "Ten Towns Great Swamp Watershed Management Committee". The Committee, founded in 1995, provides a cooperative agreement among member towns which studies issues of water quality and management. The Committee is in the process of establishing a common and comprehensive set of regulations and operating practices within the realm of their operating authority, which would prevent and/or minimize adverse impact upon water quality, wildlife and human well-being within the Watershed.

Working farms and land in agricultural production are a valuable asset to the community. The pastoral landscapes that endure on the fringe of the more densely developed core of the Township are a reminder of Bernard's agrarian roots. They also play an important role in imparting a sense of "open space" that is still apparent in many areas of the Township. Encouraging agricultural retention through farmland preservation efforts, agriculturally friendly land use policies and promoting agriculture as a business will help to retain the remaining farmland in the Township.

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TABLE VIII-1 OPEN SPACE AND CONSERVATION AREAS

| No. | BL | LOT | OWNER | PARCEL NAME/LOCATION | FUNCTION | AREA (Acres) |
|------------|-----------|------------|--------------|---|-----------------|---------------------|
| 1 | 103 | 1 | NJ Audubon | Hardscable Road/Passaic River | Private OS | 0.91 |
| 2 | 1005 | 8 | Bernards Twp | Woodland Glen-40 Walnut Circle | Twp OS | 1.25 |
| 3 | 1005 | 19 | Somerset Co. | Ross-No. Maple Ave | County OS | 8.25 |
| 4 | 1302 | 12 | Bernards Twp | Vacant Lot - West Oak Street | Twp OS | 0.32 |
| 5 | 1403 | 1.01 | Bernards Twp | Washington Ave. Park | Twp OS | 3.84 |
| 6 | 1406 | 1 | Bernards Twp | Basking Ridge Park-No. Brook Ave. | Twp OS | 1.79 |
| 7 | 1406 | 34.01 | Bernards Twp | Basking Ridge Park-No. Brook Ave. | Twp OS | 8.971 |
| 8 | 1409 | 1 | Bernards Twp | Basking Ridge Park-Conkling Street | Twp OS | 0.332 |
| 9 | 1506 | 1 | Bernards Twp | Fireman's Park-No. Finley Ave. | Twp OS | 1.74 |
| 10 | 1512 | 2 | Bernards Twp | Vacant lot-Conkling St. | Twp OS | 0.11 |
| 11 | 1609 | 21 | Bernards Twp | Southard Park-No. Maple Ave. | Twp Park | 13.92 |
| 12 | 1611 | 39 | Somerset Co. | Manchester Drive | County OS | 0.726 |
| 13 | 1701 | 11 | Somerset Co. | Ross Farm-No. Maple Ave. | County OS | 53.39 |
| 14 | 1701 | 13 | Somerset Co. | Lord Stirling Park-So. Maple Ave. | County Park | 839.972 |
| 15 | 1701 | 14 | Somerset Co. | Environmental Ed. Center-Lord Stirling Road | Env. Ed. | 4.139 |
| 16 | 1701 | 15 | Somerset Co. | Stirling House-Lord Stirling Road | County Park | 3.388 |
| 17 | 1701 | 18 | Somerset Co. | Crane Farm-Lord Stirling Road | County Farm | 3.94 |
| 18 | 1701 | 23 | Somerset Co. | Crane Farm-So. Maple Ave. | County Farm | 4.895 |
| 19 | 1701 | 24 | Somerset Co. | County Riding Stables-So. Maple Ave. | Riding Stables | 18.68 |
| 20 | 1901 | 33 | Bernards Twp | Brown-East Ash St. | Twp. OS | 5.00 |
| 21 | 1902 | 26 | Bernards Twp | Spencer Willow-Voorhees Dr. | Twp OS | 1.17 |
| 22 | 2101 | 10 | Bernards Twp | Mount Airy Heights-Mt. Airy Road | Twp OS | 5.714 |
| 23 | 2101 | 45 | Bernards Twp | OS-Chimney Ash Farm Road | Twp OS | 2.806 |
| 24 | 2301 | 11 | Bernards Twp | Former Landfill-Pill Hill Road | Twp OS | 32.48 |
| 25 | 2301 | 37 | Bernards Twp | OS-Meeker Road | Twp OS | 4.23 |
| 26 | 2301 | 41 | Bernards Twp | OS-Meeker Road | Twp OS | 9.42 |
| 27 | 2401 | 9 | Bernards Twp | 287/DOT tract-Mt. Airy Road | Twp OS | 7.7 |
| 28 | 2501 | 23 | Bernards Twp | Bernards Manor-Kinnan Way | Twp OS | 2.34 |
| 29 | 2801 | 1 | Bernards Twp | OS/Astor Fields-Collyer Lane | Athletic Fields | 20 |
| 30 | 2801 | 6 | Bd. of Ed. | So. Maple Ave. Fields | Athletic Fields | 12.44 |
| 31 | 2801 | 9 | Bernards Twp | Loocke-So. Maple Ave. | Fields/Dog Park | 6.05 |
| 32 | 2801 | 10 | Bernards Twp | War Memorial Field-So. Maple Ave. | Athletic Fields | 11.63 |
| 33 | 2905 | 6 | Bernards Twp | Homestead Park-Grove Road | Twp OS | 0.73 |
| 34 | 3101 | 18 | Bernards Twp | Meadowview Estates-Riverside Dr. | Twp OS | 1.036 |
| 35 | 3201 | 7 | Somerset Co. | Croot -Lord Stirling Road | County OS | 22.02 |
| 36 | 3201 | 8 | Somerset Co. | Croot -Lord Stirling Road | County OS | 20.596 |
| 37 | 3201 | 18 | Bernards Twp | Meadowview Estates-Riverside Dr. | Twp OS | 12.879 |
| 38 | 3302 | 6 | Bernards Twp | Meadowview Estates-Castle Way | Twp OS | 1.44 |

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| No. | BL | LOT | OWNER | PARCEL NAME/LOCATION | FUNCTION | AREA (Acres) |
|-----|------|------|--------------|--------------------------------------|---------------|--------------|
| 39 | 3303 | 12 | Bernards Twp | Meadowview Estates-Castle Way | Twp OS | 1.00 |
| 40 | 3303 | 17 | Bernards Twp | Meadowview Estates-Riverside Dr. | Twp OS | 0.828 |
| 41 | 3402 | 14 | Bernards Twp | Meadowview Estates-Hill Top Road | Twp OS | 0.3786 |
| 42 | 3802 | 22 | Bernards Twp | DB-Woods End | Twp OS | 3.84 |
| 43 | 3901 | 61 | Bernards Twp | Prince Edward Pointe-Springhouse La. | Twp OS | 19.993 |
| 44 | 3901 | 62 | Bernards Twp | OS-Tamarisk Ct. | Twp OS | 0.90 |
| 45 | 4005 | 1 | Bernards Twp | Som. Hills Luth. Church-Autumn Dr. | Twp OS | 1.74 |
| 46 | 4005 | 5 | Bernards Twp | Dawn Ridge-Sleepy Hollow Road | Twp OS | 1.2 |
| 47 | 4201 | 2 | Bernards Twp | OS-Whitenack Road | Twp OS | 3.499 |
| 48 | 4301 | 51 | Bernards Twp | McCollum Farm-Whitenack Road | Twp OS | 10.72 |
| 49 | 4601 | 5.01 | Bernards Twp | Whitenack Woods-Whitenack Road | Twp OS | 185.19 |
| 50 | 4902 | 21 | Bernards Twp | Rebel Hill Park-Fairview Dr. So. | Twp Park | 10.42 |
| 51 | 5303 | 19 | Bernards Twp | Cedar Knolls-Galloping Hill Road | Twp OS | 2.6 |
| 52 | 5303 | 28 | Bernards Twp | Cedar Knolls-Galloping Hill Road | Twp OS | 6.00 |
| 53 | 5503 | 13 | Bernards Twp | Prince Edward Pointe-Brittany Place | Twp OS | 6.999 |
| 54 | 5601 | 10 | Bernards Twp | Prince Edward Pointe-Jeffrey Ct. | Twp OS | 1.463 |
| 55 | 5602 | 5 | Bernards Twp | Somerset Homes-Gerard Ave. | Twp OS | 1.58 |
| 56 | 5602 | 35 | Bernards Twp | Prince Edward Pointe-Jeffrey Ct. | Twp OS | 4.093 |
| 57 | 5802 | 1 | Bernards Twp | Thompson Island-Lyons Road | Twp OS | 0.63 |
| 58 | 5901 | 1 | Bernards Twp | OS-Stonehouse Road | Twp OS | 3 |
| 59 | 5901 | 2 | Bernards Twp | OS-So. Finley Ave. | Twp OS | 14.902 |
| 60 | 5901 | 29 | Bernards Twp | Summit-Stonehouse Road | Twp OS | 14.136 |
| 61 | 6001 | 11 | Bernards Twp | Schmidt Park-Pond Hill Road | Twp OS | 5.00 |
| 62 | 6102 | 1 | Bernards Twp | Schmidt Park-Pond Hill Road | Twp OS | 3.83 |
| 63 | 6103 | 1 | Bernards Twp | Schmidt Park-Pond Hill Road | Twp OS | 6.73 |
| 64 | 6303 | 12 | Bernards Twp | Fawn Hill-Pheasant Run | Twp OS | 1.968 |
| 65 | 6401 | 1 | Bernards Twp | Summit-Stonehouse Road | Twp OS | 13.884 |
| 66 | 6401 | 5 | Bernards Twp | Sherbrook-Governor Dr. | Twp OS | 6.246 |
| 67 | 6404 | 9 | Bernards Twp | Sherbrook-Blackburn Dr. | Twp OS | 4.465 |
| 68 | 6404 | 27 | Bernards Twp | DB Sherbrook-Governor Dr. | Twp OS | 4.587 |
| 69 | 6501 | 1 | Bernards Twp | Summit-Summit Dr. | Twp OS | 15.01 |
| 70 | 6503 | 1 | Bernards Twp | Sherbrook-Blackburn Dr. | Twp OS | 5.514 |
| 71 | 6703 | 7 | Bernards Twp | Pleasant Valley Park-Penwood Road | Twp Park | 4.34 |
| 72 | 6801 | 27 | Bernards Twp | Summit-Summit Dr. | Twp OS | 3.878 |
| 73 | 6801 | 44 | Bernards Twp | Summit-Knollcroft Road | Twp OS | 2.409 |
| 74 | 6802 | 4 | Bernards Twp | Glenbrook-Bryon Dr. | Twp OS | 5.77 |
| 75 | 7001 | 15 | Bernards Twp | Grist Mill Park-Grist Mill Dr. | Twp OS | 1.261 |
| 76 | 7002 | 22 | Bd. of Ed. | OS-Lincroft Dr. | Bd. of Ed. OS | 14.69 |
| 77 | 7002 | 33 | Bernards Twp | Lincroft-Lincroft Dr. | Twp OS | 0.3569 |
| 78 | 7101 | 9 | Bernards Twp | Canterbury Road Walkway | Twp OS | 0.264 |
| 79 | 7101 | 25 | Bernards Twp | Canterbury Road Walkway | Twp OS | 0.203 |
| 80 | 7101 | 29 | Bernards Twp | Canterbury Road Walkway | Twp OS | 0.137 |
| 81 | 7201 | 28 | Bernards Twp | OS-Mine Brook Road | Twp OS | 0.92 |

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| No. | BL | LOT | OWNER | PARCEL NAME/LOCATION | FUNCTION | AREA (Acres) |
|-----|------|-------|-----------------|--|--------------|--------------|
| 82 | 7301 | 27 | Bernards Twp | Arrow Head-Mine Brook Road | TWP OS | 21.129 |
| 83 | 7301 | 35 | Bernards Twp | River View-Liberty Corner Road | Twp OS | 3.727 |
| 84 | 7302 | 1 | Bernards Twp | Arrow Head-Mine Brook Road | Twp OS | 0.657 |
| 85 | 7302 | 5 | LC Fire Co. | LC Fields-Church St. | LC Fire Co. | 8 |
| 86 | 7302 | 11 | Bernards Twp | Arrow Head-Mine Brook Road | Twp OS | 4.911 |
| 87 | 7402 | 12 | Bernards Twp | Canterbury Road Walkway | Twp OS | 0.131 |
| 88 | 7501 | 3 | Bd. of Ed. | Fields-Liberty Corner School | Fields | 5.01 |
| 89 | 7601 | 15 | Bernards Twp | Harrison Brook-Goltra Dr. | Twp OS | 3.83 |
| 90 | 7703 | 22 | English Family | English Farm Meadow-Valley Road | Farm Pres. | 16.281 |
| 91 | 7804 | 8 | Bernards Twp | Pleasant Valley Park-Lurline Dr. | Twp OS | 1.43 |
| 92 | 7901 | 10 | Bernards Twp | Pleasant Valley Park-Archgate Road | Twp OS | 0.92 |
| 93 | 7903 | 6 | Somerset Co. | Harrison Brook-Lyons Rd | County OS | 1.21 |
| 94 | 8001 | 1 | Bernards Twp | Pleasant Valley Park-Valley Road | Twp OS | 79.14 |
| 95 | 8001 | 2 | Bernards Twp | Pleasant Valley Park-Valley Road | Twp OS | 24.52 |
| 96 | 8001 | 3 | US VA | Coakley Russo Golf Course-Valley Rd | Twp Golf | 23 |
| 97 | 8002 | 4 | US VA | Coakley Russo Golf Course-Valley Rd | Twp Golf | 22 |
| 98 | 8101 | 3 | Bernards Twp | Sherbrook-Stonehouse Road | Twp OS | 49.469 |
| 99 | 8101 | 23 | Bernards Twp | DB Sherbrook-Stonehouse Road | Twp OS | 2.077 |
| 100 | 8101 | 47 | Bernards Twp | DB Sherbrook-Stonehouse Road | Twp OS | 4.013 |
| 101 | 8102 | 18 | Bernards Twp | Sherbrook-Valley Road | Twp OS | 0.3356 |
| 102 | 8301 | 1 | Bernards Twp | Pine Hills-Haas Road | Twp OS | 3.22 |
| 103 | 8301 | 6 | Bernards Twp | Pine Hills-Haas Road | Twp OS | 10.22 |
| 104 | 8301 | 11.02 | Bernards Twp | Bologna-Haas Road | Twp OS | 11.06 |
| 105 | 8401 | 16 | Bernards Twp | Hayefields-Crest Dr. | Twp OS | 6.5 |
| 106 | 8501 | 1 | Bernards Twp | Spring Ridge-Acken Road | Twp OS | 73.524 |
| 107 | 8501 | 2 | Bernards Twp | Crown Court-King George Road | Twp OS | 0.337 |
| 108 | 8501 | 3 | Bernards Twp | Crown Court-King George Road | Twp OS | 5.887 |
| 109 | 8501 | 4 | Bernards Twp | Crown Court-King George Road | Twp OS | 0.261 |
| 110 | 8501 | 5 | Bernards Twp | Crown Court-King George Road | Twp OS | 54.169 |
| 111 | 8501 | 41 | Passaic Rv. Co. | Passaic River Coalition-King George Rd | Private OS | 82.77 |
| 112 | 8501 | 44 | Bernards Twp | Dewy Meadow-King George Road | Twp Fields | 4.849 |
| 113 | 8501 | 45 | Bernards Twp | Crown Court-King George Road | Twp OS | 14.094 |
| 114 | 8501 | 46 | Bernards Twp | Spring Ridge-Acken Road | Twp OS | 25.071 |
| 115 | 8501 | 47 | Bernards Twp | Spring Ridge-Acken Road | Twp OS | 37.05 |
| 116 | 8502 | 2 | Bernards Twp | Farmstead Park-King George Road | Twp Park | 32.035 |
| 117 | 9101 | 2 | Bernards Twp | Society Hill-Spring Valley Blvd. | Twp OS | 90.05 |
| 118 | 9101 | 3 | Bernards Twp | Cedars-Spring Valley Blvd. | Twp OS | 130.391 |
| 119 | 9204 | 4 | Bernards Twp | Little League Fields-Valley Road | Twp Fields | 23.70 |
| 120 | 9204 | 6 | Bernards Twp | Society Hill-Spring Valley Blvd. | Twp OS | 32.01 |
| 121 | 9204 | 8 | Bernards Twp | Society Hill-Spring Valley Blvd. | Twp OS | 28.45 |
| 122 | 9205 | 1 | Bernards Twp | Martinsville Rd Island-Mt. Airy Road | Twp OS | 0.79 |
| 123 | 9301 | 9.01 | English Family | English Farm Preservation-Valley Rd | Pres. Rights | 64.298 |
| 124 | 9401 | 11 | Bernards Twp | Sons Of Liberty Farm-Allen Road | Twp. OS | 23.08 |
| 125 | 9501 | 3 | Bernards Twp | Dunham Park-Liberty Corner Road | Twp Park | 69.543 |

VIII. CONSERVATION AND OPEN SPACE PLAN ELEMENT

| No. | BL | LOT | OWNER | PARCEL NAME/LOCATION | FUNCTION | AREA (Acres) |
|-----|-------|------|----------------|-------------------------------|--------------|--------------|
| 126 | 10301 | 26 | Bernards Twp | The Hills-Allen Road | Twp. OS | 4.523 |
| 127 | 10301 | 27 | Bernards Twp | The Hills-Allen Road | Twp. OS | 4.523 |
| 128 | 10401 | 38 | URWA | Upper Raritan OS-Milito Way | URWA OS | 19.25 |
| 129 | 10402 | 3 | Bernards Twp | Old Somerville Road | Twp. OS | 0.36 |
| 130 | 10704 | 39 | Bernards Twp | The Hills-Old Stagecoach Road | Twp. OS | 3.88 |
| 131 | 10704 | 95 | Bernards Twp | The Hills-Old Stagecoach Road | Twp. OS | 1.76 |
| 132 | 10704 | 96 | Bernards Twp | The Hills-Old Stagecoach Road | Twp. OS | 1.76 |
| 133 | 10801 | 97 | NJDOT | Old Stagecoach Road | NJDOT | 9.59 |
| 134 | 11001 | 14 | Somerset Co. | DeMarco-Somerville Road | County OS | 5.38 |
| 135 | 11001 | 15 | Somerset Co. | Somerville Rd. | County OS | 11.47 |
| 136 | 11101 | 2 | Somerset Co. | AT&T-Rickey Lane | County OS | 33.904 |
| 137 | 11101 | 6 | Somerset Co. | Knox-Somerville Road | County OS | 6.596 |
| 138 | 11102 | 5 | Somerset Co. | AT&T-Mountain Road | County OS | 0.633 |
| 139 | 11102 | 6 | Somerset Co. | AT&T-Mountain Road | County OS | 84.898 |
| 140 | 11102 | 41 | Somerset Co. | Rickey Lane | County OS | 20.108 |
| 141 | 11201 | 1 | English Family | English Wood Lot-Allen Road | Pres. Rights | 58.596 |
| 142 | 11201 | 6 | Bernards Twp | Pinson-Allen Road | Twp. OS | 5.228 |
| 143 | 11201 | 11 | Bernards Twp | Pinson-Allen Road | Twp. OS | 4.978 |
| 144 | 11501 | 5.02 | Somerset Co. | Prochaska-Mountain Road | County OS | 14.357 |
| 145 | 11501 | 6 | Somerset Co. | McNellis-Mountain Road | County OS | 29.264 |
| 146 | 11501 | 18 | Somerset Co. | Maolucci-Mountain Road | County OS | 25.763 |
| 147 | 11501 | 19 | Somerset Co. | Maolucci-Mountain Road | County OS | 14.20 |
| 148 | 11501 | 20 | Somerset Co. | Maolucci-Mountain Road | County OS | 1.65 |
| 149 | 11501 | 21 | Somerset Co. | Maolucci-Mountain Road | County OS | 0.91 |
| 150 | 11501 | 22 | Somerset Co. | Maolucci-Mountain Road | County OS | 1.19 |
| 151 | 11501 | 23 | Somerset Co. | Maolucci-Mountain Road | County OS | 31.021 |
| 152 | 11601 | 1 | Bernards Twp | Mountain Park-Mountain Road | Twp Park | 143.864 |
| 153 | 11601 | 23 | Somerset Co. | Pasnik-Sunset La. | County OS | 20.961 |
| 154 | 11601 | 25 | Somerset Co. | Off Long Road | County OS | 15.24 |
| 155 | 11701 | 19 | Somerset Co. | DB-Martinsville Road | County OS | 0.56 |
| 156 | 11702 | 7 | Bernards Twp | Darren Woods-Darren Dr. | Twp. OS | 0.86 |
| 157 | 11702 | 10 | Bernards Twp | Darren Woods-Darren Dr. | Twp. OS | 2.44 |
| 158 | 11702 | 11 | Bernards Twp | Darren Woods-Darren Dr. | Twp. OS | 13.872 |
| 159 | 11702 | 28 | Bernards Twp | 20' wide trail-end Darren Dr. | Twp OS | 0.331 |
| | | | | Total | | 3235.88 |

HISTORIC STRUCTURES AND DISTRICTS

A document entitled “Inventory of Historically Significant Homes in Bernards Township” identifies more than 370 historically significant buildings in Bernards

VIII. CONSERVATION AND OPEN SPACE PLAN ELEMENT

Township. The inventory includes lot and block, address, use, circa and style of each building of significant age, heritage or style, and is a rewrite of the document originally prepared in the late 1970's.

A detailed history of Bernards Township and recommendations for management of historic and archaeological resources are found in the Historic Preservation Plan Element.

RELATIONSHIP OF THE CONSERVATION PLAN TO OTHER PLAN ELEMENTS

Bernard's Conservation Plan works in tandem with the Land Use Plan, the latter providing for low intensity residential, farm and conservation uses outside the developed neighborhood areas of the Township. The Conservation Plan promotes resource management efforts that will retain ecological function, prevent destruction of sensitive resource areas and provide long term protection of the natural resource base.

The conservation objectives of retaining large contiguous areas of sensitive natural lands will be assisted by proposals for future land uses contained in the Land Use Plan. The low density of permitted development recommended throughout the remainder of Bernards will assist the preservation of the desirable features of the countryside, and permit coordinated conservation and preservation efforts.

The Parks and Recreation Plan element proposes to continue the Township's program of open space preservation and development of recreation facilities. Potential park development is assessed based on the presence of critical features and is carried out in a manner which respects them. As such, the Parks and Recreation Plan supports the objectives of this Conservation Plan.

The Circulation Plan element proposes the establishment and expansion of a comprehensive network of sidewalks, bikeways and paths that will promote non-vehicular travel and reduce the air quality impacts of motorized vehicles. These expanding opportunities for access to open spaces, recreation areas and other destinations will also have human health benefits as more residents become involved in these activities.

The impacts on natural resources from the circulation and utility service plan elements will be minor, since they do not propose significant alterations to the existing road network and no new infrastructure and utility services are proposed.