

# CHATHAM TOWNSHIP CONSERVATION PLAN ELEMENT

## PART I

*We do not inherit the earth from our ancestors,  
We borrow it from our children*

*-Native American Proverb*

### INTRODUCTION AND PURPOSE

The Township of Chatham (Township) recognizes the need to plan for future open space, conserving natural resources and protecting environmentally sensitive areas, specifically sensitive areas such as steep slopes, wetlands, streams, recharge areas and flood plains as well as mature vegetation, groundwater, and air quality. Although they are among the most valuable assets of the Township, open space and natural and historic resources are under continuing development pressure. Unless steps are taken to protect them, these resources could be lost forever.

The purpose of the Conservation Element is to set forth:

- a. specific objectives related to preservation of open space and historic and natural resources, and protecting environmentally sensitive areas in Chatham Township, and
- b. strategies for achieving those objectives.

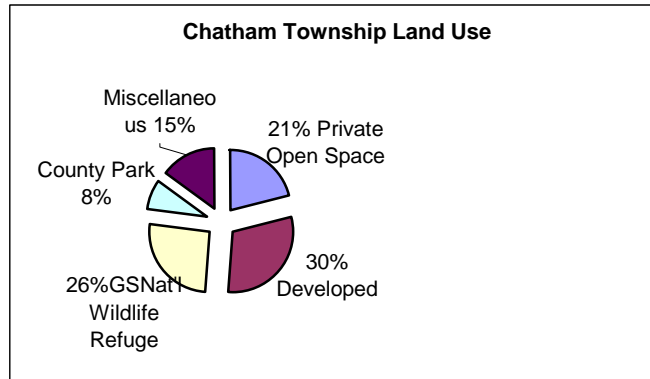
The Conservation Plan Element consists of two parts. Part I articulates objectives and strategies for the conservation of open space and historic and natural resources, and protecting environmentally sensitive areas in Chatham Township. It is based on the natural resource goals of the Master Plan, and assets and attributes that the community regards as important to protect. Part II consists of the existing Chatham Township Natural Resources Inventory (NRI), last revised in 1999, with additions in 2004. The NRI is the factual inventory of the community's physical assets and attributes and indicates both what and where they are located.

### BACKGROUND

Chatham Township covers an area of approximately 6,008 acres. The chart below taken from the Natural Resources Inventory depicts the land use as of 1997. At that time approximately 30% of that area was developed, 26% was the Great Swamp National Wildlife Refuge, 8% was county park land, and about 15% was taken up by streets, school lands, municipal property and religious property. The remaining 21% at that time was privately owned open space in three principal locations: portions of the Loantaka

Brook watershed outside the sewer service area, lands adjacent to the Great Swamp, and steep slopes and floodplains in the Passaic River watershed.

This open space provides distinctive natural, cultural, and historic resources, accommodates recreational activities, and supports surface and groundwater resources. And yet, this is the space that is shrinking as development occurs.



New development was light in the 1970s and early 1980's and continued to be modest into the late 1980's and early 1990's due in part to Chatham Township's limited sewage treatment plant capacity. However, construction of the Chatham Glen Water Pollution Control Plant (WPCP#2) in 1986 allowed development of 900 townhouse units adjacent to the Passaic River. No effort was made at that time to expand sewer capacity at the Tanglewood Lane Water Pollution Control Plant (WPCP#1) - the main sewer plant. Also in the mid-eighties, the NJDEP required the Tanglewood Lane treatment plant to meet more stringent effluent standards. As part of a strategy to meet the Township's multiple objectives of upgrading the existing Tanglewood Lane Plant and to provide adequate sewage treatment capacity for the existing zoning, the township decided to expand the capacity from 750,000 gallons per day to 1 million gallons per day.

In light of public concern over primary and secondary impacts to the Great Swamp National Wildlife Refuge that could result from expansion of the Tanglewood Lane Plant, the New Jersey Department of Environmental Protection (NJDEP) delayed approval of water quality management planning approval of the expansion until receiving recommendations from a three-year study by the Great Swamp Watershed Advisory Committee (GSWAC). The GSWAC was composed of representatives from all 10 towns in the Great Swamp watershed along with county, state and federal government, builders, and civic groups. The Chatham Township Wastewater Management Plan was approved by the NJDEP in 1993. The approval was subject to a number of conditions the purpose of which is to protect the Great Swamp National Wildlife Refuge from both point and non-point sources of pollution and the "desirability of establishing a water quality management planning goal of "no net increase" with respect to both stormwater quantity and pollutant loadings affecting the Great Swamp watershed in general and the Great

Swamp National Wildlife Refuge in particular”<sup>1</sup>. Based on GSWAC recommendations, NJDEP required the Township to adopt a stringent “no-net increase” Stormwater Ordinance, adopt a Septic Management Plan, develop a Stormwater Management Plan, develop a Water Conservation Plan, and perform intensive and ongoing streamflow water quality monitoring program in the Black Brook upstream and downstream of the Tanglewood Lane Plant.

The Township’s Master Plan, Zoning, and Land Use Ordinances remained largely unchanged between 1979 and 1996. The Township passed a “no-net increase” Stormwater Ordinance in 1997 and initiated a major Master Plan revision process which resulted in larger lot zoning, ordinances to control development adjacent to wetlands, streams, and steep slopes, and a useable area ordinance that requires a contiguous area on each lot to be free of environmentally sensitive areas.

Township residents concerned about loss of open space with its values for recreation, air and water quality, and privacy, approved a referendum in 1996 to establish an open space tax of one cent per \$100 of assessed valuation. At meetings during the 1997/1998 revision of the Master Plan, Township residents expressed their desire to preserve the appearance of an open, semi-rural community with ample space between neighbors, tree-lined streets, parks, and the ability to walk as much as possible rather than be required to drive to get to every destination. The Open Space Tax rate was increased by referendum in 1999 to two cents per \$100 of assessed value, and reduced to one cent per \$100 in 2005, when assessed real estate values doubled. An Open Space Committee was formed which obtained county and federal grants to augment the funds from the Township open space tax and approximately one hundred and forty acres have been preserved, as of 2004.

## **STATUTORY AUTHORIZATION**

The Municipal Land Use Law (*N.J.S.A. 40:55D-1 et seq.*), which authorizes municipalities to plan and zone to promote the general welfare, includes 15 purposes (NJSA 40:55D-2). More than half of these purposes highlight the importance of conserving natural resources and maintaining a clean, healthy environment, as the enabling statute calls on municipalities to

- Protect the public health and safety (NJSA 40:55D-2a) bear a direct relationship to the use and management of New Jersey’s land and water resources;
- Secure safety from floods and other natural and manmade disasters (NJSA 40:55D-2b) and provide adequate light, air and open space (NJSA 40:55D-2c);

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<sup>1</sup> Letter of approval of the Chatham Township Wastewater Management Plan from Martin A. Bierbaum, Administrator, NJDEPE Office of Land and Water Planning to Mayor Richard Russomano, August 27, 1993.

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- Preserve the environment, in part through planning for “appropriate population densities and concentrations” (NJSA 40:55D-2e);
- Provide sufficient space in appropriate locations for a variety of land uses, including public and private open space, according to their respective environmental requirements, to meet the needs of all New Jersey citizens (NJSA 40:55D-2g);
- 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” (NJSA 40:55D-2j);
- Promote utilization of renewable energy sources (NJSA 40:55D-2n) and promote the maximum practicable recovery and recycling of recyclable materials (NJSA 40:55D-2o)

In furtherance of its significant conservation objectives, the MLUL 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;”*

This Conservation Plan outlines Chatham Township’s strategies to meet the statutory purpose to preserve, conserve and utilize natural resources. While it is designed to function in concert with the other plan elements, the most important linkage will be between the Land Use Plan and the Conservation Plan. Together, these plan elements propose the location, scale and intensity of new development and the resource management strategies needed to protect the environment.

## **SUMMARY OF CONSERVATION FACTORS**

Chatham Township contains a multitude of natural resources which together help define the essential character of the Township. Anchoring the eastern terminus of the Great Swamp, the Township’s landscape is a contrast to that of its more developed neighbors. In addition to being an aesthetic asset, the Great Swamp is a major regional ecological preserve and the portions of the Township on the periphery of the Great Swamp National Wildlife refuge, within and/or adjacent to the Great Swamp serve a vital role as a buffer that to some extent absorbs and filters the effects of man’s activities and thereby is critical to the sustainability of the Refuge. This rich wildlife habitat is the natural heart of the Township, which lends a unique sense of place and is a central element in the character of the community.

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The Great Swamp watershed is located within portions of two counties (Morris and Somerset) and ten towns, including the regional center of Morristown, suburban towns including, Bernards, Chatham Township, Long Hill, Morris Township, and Madison, and more rural areas in Bernardsville, Harding and the Mendhams.

The landform, surface waters and groundwater of the Township interact to create a distinctive and varied landscape, which imparts the township's unique character. The capabilities and limitations of the natural resource base within the Township have determined the locations of current development. The following is a brief summary of environmental factors, which are described in greater detail in the Natural Resource Inventory.

### *TOPOGRAPHY*

The Township is characterized by rolling terrain and expansive lowlands, with higher elevations along the Third Watchung ridge to the south. Chatham Township's topography is dominated by Long Hill, one of three parallel ridgelines of the Watchung Mountain, which divides the lowlands of the Great Swamp to the north, and the Passaic River along the Township's southern boundary. Significant relief is observed across the Township, with elevations ranging from 460' above sea level at Mt. Vernon, to the lower elevations of the Passaic River floodplain (El. 200) and the Great Swamp (El. 240). Hickory Tree to the north rises above the swamp to El. 290.

### *GEOLOGY*

Situated within the Piedmont Plain, the Township has been shaped by a confluence of geologic events. During the Triassic Period of geologic history, volcanic activity resulted in basalt flows, which formed Long Hill and the other Watchung Ridges. This hard rock was less susceptible to weathering than the red sandstones and shales that were deposited at the bottoms of lakes and in swamps, resulting in the contrast between the prominent ridge and the wide Passaic Valley and Great Swamp.

Glacial Lake Passaic, the 200' to 250' deep temporary impoundment created during the Wisconsin Stage of the glacial epoch, left behind the Great Swamp as a minor remnant of its extensive coverage. The glacial advance disrupted or reworked older geologic deposits, and reached its southernmost limit in the Township, depositing the boulders, rocks and earth of the terminal moraine. It also created the 80-square mile Buried Valley Aquifer, a series of pre-glacial valleys filled with water-rich glacial and post-glacial sediments, a critical water supply source relied upon by over a half million people.

Protection of groundwater resources requires the protection of aquifer recharge areas, where permeable soils and natural drainage patterns permit the infiltration of surface runoff into the underlying geologic structure. An area of exceptional recharge potential

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has been identified along Chatham Township's border with Madison, generally north and slightly south of Southern Boulevard. Protection of 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.

### *SURFACE WATERS*

The Passaic River is a 90-mile waterway, traversing 45 municipalities and providing drinking water for more than 2 million people. The westernmost of the five streams that traverse the Great Swamp the Passaic River passes through more Great Swamp communities than any of the four other streams that join it before it exits the Great Swamp via Millington Gorge.

The Passaic River forms the Township's southern border with Berkeley Heights and New Providence and flows from southwest to northeast. The upper reaches of the Passaic are pristine, meeting or exceeding every baseflow and stormflow standard set by the state, owing to their origin in a relatively undeveloped portion of the watershed. However, macroinvertebrate sampling south of Route I-287 between 1999 and 2001 indicates water quality in the "poor" to "very poor" range.

Macroinvertebrates are small animals without backbones (insects, worms, larvae, etc.) visible with the naked eye, and water bodies have communities of aquatic macroinvertebrates. The species composition, species diversity and abundance of the macroinvertebrates in a given water body can provide valuable information on the relative health and water quality of a waterway.

Loantaka Brook drains the northwest portion of the Township including the Green Village area, and Black Brook drains the rest of the Township that is within the Great Swamp Watershed. Both streams flow into the Great Swamp before reaching the Passaic River. Along their course, they traverse diverse areas and encounter pollution sources that affect water quality.

Loantaka Brook receives treated sewage effluent and stormwater runoff before it flows through the Loantaka Brook Reservation, one of the most heavily used Morris County parks, into the Great Swamp National Wildlife Refuge. Loantaka Brook is the most degraded stream in the watershed, meeting none of the standards set by the Great Swamp Ten Towns Committee in June 2002 as a result of non-point source pollution and an excessive volume of water in the stream channel.

The Great Swamp Watershed Association's Adopt-A-Stream program has begun testing Loantaka Brook to better characterize the sources and types of pollutants that enter the brook upstream, and will develop a recommended remediation program for the stream, to serve as a pilot for adopting Great Swamp's other streams.

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Excess water volume from the Woodland Wastewater Treatment Plant upstream of Kitchell Pond scours the stream's banks, eroding sand and undercutting streamside vegetation and trees. In addition, residential neighborhoods and commercial developments discharge stormwater runoff directly to the stream, where it combines with the effluent from the sewage treatment plant to impair downstream water quality, as it widens the stream and makes it shallower. This raises water temperatures, degrading the habitat for native species. The Loantaka has the lowest species concentration of any stream in the Great Swamp watershed.

Black Brook has numerous tributaries, two of which arise near the intensely developed Hickory Square shopping center. These streams carry significant volumes of untreated stormwater runoff from parking lots, roads and buildings. Other tributaries drain a municipal playground and ball fields, traverse the Fairmount Country Club and accept treated effluent from the Tanglewood Lane Wastewater Treatment Plant.

The effects of stormwater runoff from developed areas and chemical fertilizers and pesticides used on lawns make the Black Brook second only to Loantaka in degraded water quality, failing to meet Ten Towns Committee 2002 water quality standards under both baseflow and storm conditions. Studies also show Black Brook having one of the lowest macroinvertebrate species counts of the watershed's five feeder streams, reflecting the negative impacts of pollution.

#### *WETLANDS*

Wetlands are a central landscape element in Chatham Township, with the largest contiguous area of wetlands found within the Great Swamp, extending northward from Meyersville Road/Fairmount Avenue to Green Village Road. Wetlands are also found along the floodplains of the Loantaka Brook and the Passaic River. Wetlands within the Township play an important role in filtering contaminants as well as retaining precipitation and slowly feeding it to headwater streams. Development has caused an increase in impervious surfaces and a decrease in vegetation and tree cover, which has increased the volume of water reaching the swamp, endangering the health of the ecosystem.

#### *STEEP SLOPES*

The U.S. Natural Resources Conservation Service and the State Development and Redevelopment Plan (SDRP) indicate that slopes greater than 10 percent are more erodible, need special stormwater management and roadway specifications, and raise costs for infrastructure. These sources also indicate that slopes from 10-25 percent should be left in a natural condition, maintained in grass or tree cover, or used as pastureland while slopes greater than 25 percent should be undisturbed but can provide good sites for passive recreation or wildlife. An additional consideration is that because of the difficulty and expense of construction in steep sloped areas, those areas are often the last remaining undisturbed headwaters of small creeks and streams. Undisturbed

headwaters areas serve a unique and irreplaceable role in preserving water quality, recharge, and associated biota. Those areas are also a critical component of the landscape of the Township, and due to the associated topography can be observed from great distances, providing important and defining vistas.

Disturbing the plant life, drainage patterns, topography or soils on steep slopes increases the volume and speed of runoff, causing erosion and in some cases, soil creep, slumping (sections of soil shifting down and outward on the slope), and landslides. An extreme but illustrative example of this process in its most dramatic form are the developments on steep slopes, or at the base of steep sloped areas in southern California where the devastating effects of these hazards, resulting in extensive property damage and loss of life has occurred as a consequence of suburban development encroaching into fragile, sensitive and unstable steep sloped areas. When a hillside is cleared, leaves and branches no longer shield the soil from wind and rain; roots no longer hold the soil in place; and the smoother slope allows the runoff to travel faster, increasing erosion and decreasing groundwater recharge. These problems become progressively more dramatic as slopes get steeper.

Development on steep slopes can also affect the ability of the prevailing soils to infiltrate precipitation, due to soil compaction, disturbance of thin soils, and removal of vegetation or exposure of bedrock. This results an increase in runoff and can lead to additional instability of the down gradient soil and rock. Although many of the problems related to development in steep-sloped areas can be solved with appropriate design and construction techniques, there are considerable risks to adjacent properties during construction, and to the property owner and neighbors should the measures employed to mitigate the encroachment into steep slopes not be properly maintained, repaired and/or upgraded as necessary.

Steep slopes in Chatham Township are most prominent above the Passaic River, along the Third Watchung Ridge. Areas of Steep slopes are also found west of the Hickory Tree shopping center and north of Shunpike Road, west of Loantaka Way, north of Shunpike Road terminus and along Spring Valley Road.

Slopes along the four-mile length of the Third Watchung Ridge in Chatham Township, which range from 10 percent to over 25 percent, have remained largely undeveloped due to the development constraints posed by the slope. Highly permeable sandy soils on slopes north of Shunpike Road and west of Loantaka Way, part of an important groundwater recharge zone identified by the NJ Geological Survey, have moderate development constraints with erosion and groundwater pollution potential. Wet, shallow soils characterize the Slopes along Spring Valley Road, dotted with spring and seeps.

Of the dominant soils with sloping topography in the Township, the Morris County Soil Survey cites severe limitations for local roads, streets, and parking lots on the Boonton gravelly loam with 8-15% slopes, while Ellington fine sandy loam on 8-25 percent slopes exhibits severe limitations for foundations, lawns, landscaping, septic tank fields, local roads, streets and parking lots, picnic and play areas. The Holyoke-Rock outcrop

complex on 15-35% slopes is severely constrained for all developed land uses, because of the hard, steep bedrock at a depth of less than 1½ feet and rock outcrop, and the Klinesville shaley silt loam, on 25-35 percent slopes has severe constraints for all categories of town and country planning because of bedrock at a depth of less than 1½ feet.

### *FORESTED AREAS AND NATIVE VEGETATION*

Despite the substantially developed character in the eastern and southern portions of the Township, the central and northwestern portions of the Township retain large contiguous natural areas. The Great Swamp, dominated by herbaceous wetlands, is ringed with deciduous wooded wetlands along its periphery. These wooded wetlands extend along the Loantaka Brook and the Passaic River floodplain, while upland deciduous forest vegetation mantles the ridge of Long Hill.

Deciduous forest patches are also found in northern Chatham Township, interspersed with cropland and pastureland and deciduous wooded wetlands. Forests provide a wide range of benefits, including improving air quality, aiding aquifer recharge and preventing soil erosion. The preservation of this forest cover is of critical importance both as wildlife habitat and to help preserve the rural character of the district.

The NJDEP publication titled “Protection and Care of Urban Forests” provides a detailed list of the resources protected and offered by forested areas, which

- 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 due to the high moisture holding capacity of forest soils, litter layer and tree canopy
- Trees and associated vegetation and landforms serve a vital function and in great part define the existing hydroperiod in adjacent and downstream areas (the length of time land is covered with water) by regulating water quantity through evapotranspiration<sup>2</sup>.
- Enhance the visual characteristics of the scenic corridors
- Reduce noise pollution
- Produce oxygen

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<sup>2</sup> For example, emergent wetlands such as marshes, meadows and the vegetation on the periphery of open water are flooded seasonally. Preservation of the existing duration of water covering the land, the timing of recession of water; i.e. the hydroperiod, is critical to maintenance of the existing habitats. Trees serve a vital role in maintenance of hydroperiod – removal of trees, changing land cover and improving drainage eliminates the water management function of trees, especially contiguous stands of trees, and thereby can change the ecology of downstream systems.

*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 an ecosystem-based 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. The result of the ENSP effort is the NJ Landscape Project, designed to protect New Jersey's biological diversity by maintaining and enhancing imperiled wildlife populations within healthy, functioning ecosystems.

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. The habitat data was combined with the Natural Heritage Program's Biological Conservation Database (BCD) 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 NJ Landscape Project data was developed 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:

- 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

The Landscape Project data provides users with scientifically sound, peer-reviewed information on the location of critical habitat, based on the conservation status of the species 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

The Great Swamp wildlife refuge is a rich mix of grasslands, sandy knolls, ponds, brooks, marshes, woodlands and ridges, which displays plants from both southern and northern zones, including 215 species of wildflowers. Forested wetland is the most extensive habitat for threatened and endangered species found in the Township. Emergent wetlands, including marshes and wet meadows dominated by erect, rooted herbaceous hydrophytes (wet tolerant plants), constitute another important habitat type suitable to support populations of threatened and endangered species.

On a larger scale, the Great Swamp is home to 220 bird, 33 mammal, 21 reptile, 18 amphibian and 29 fish species, including 26 species listed by the state of New Jersey as threatened or endangered. Great Swamp also hosts one of the state’s largest breeding populations of Eastern Bluebirds, and a thriving Great Blue Heron rookery.

Chatham Township is endowed with a core of critical habitat for threatened and endangered species, as seen on Figures 1 and 2. Figure 1 identifies forested wetland and emergent habitats by rank, while Figure 2 illustrates forests and grasslands.

Rank 5 forested wetlands, habitat to Federally-listed threatened and endangered species, dominates the central portion of the Township, within the Great Swamp. Emergent wetlands, hosting State endangered species (Rank 4) are woven within these forested wetlands, which are ringed with Rank 4 forested wetlands. Wood Turtle foraging areas are identified within these forested wetlands, and two patches of grassland (Rank 1 – suitable) are found in the northern portion of the Township.

### SUSTAINABILITY AND STEWARDSHIP

*Sustainability* is a widely referenced term that merits a fairly precise definition, since it is guiding public policy. In 1987, the World Commission on Environment and Development developed a definition of sustainability that was included in its findings, which became known as the Brundtland Report. It stated that:

*Sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs.*

Although this definition has become widely publicized, the full meaning of sustainability is somewhat broader, and relates to the health of the planet. The 1992 Rio Earth Summit and subsequent G7/G8 conferences promoted living, working and ordering society in ways that are environmentally "sustainable", by reducing waste and pollution, re-using resources, promoting biodiversity, etc. In nature conservation terms, sustainability means using natural resources in a manner and to an extent that they can be renewed, and the environment's natural qualities can be maintained for the long term.

*Stewardship* embodies the concept of land as a resource, and recognizes our responsibility to wisely manage that resource for the benefit of current and future generations. Chatham Township's Conservation Plan seeks to advance an understanding of the limits of natural resources and to promote stewardship and conservation-oriented policies at the municipal, county and State level, and to advance conservation education at all levels.

## **THE CONSERVATION PLAN**

This Conservation Plan outlines the Township's goals and strategies to meet the statutory mandate to protect the environment. While it is designed to function in concert with the other plan elements, the most important linkage will be between the Land Use Plan and the Conservation Plan. Together, these plan elements propose the location, scale and intensity of new development and the resource management strategies needed to protect the environment. The consistency of Chatham Township's zoning with the environmental, aesthetic, development and other objectives of the Master Plan should be reviewed to ensure that local regulations effectively reflect natural resource and other policy objectives.

**OBJECTIVE 1.** Establish lawful mechanisms for the protection of the environmentally critical areas, as identified in the Township's NRI.

Alternative planning techniques should be examined to determine if they are effective in protecting natural resources. The effectiveness of current zoning regulations protecting streams, slopes, wetlands, aquifers, flood hazard areas might be enhanced through the introductions of overlay zones, which may cross several zones.

### **Strategies:**

- a. **Adopt useable lot area requirements.** Develop a revised useable lot area ordinance. Evaluate the use of proportionality in addition to, or in lieu of, fixed area requirement for useable lot area as appropriate for each zone in the Township. Implement the steep slope requirements to improve protection of steep slopes, and other environmentally critical areas of the property.

- b. **Refine lot size averaging.** Develop design standards and other ordinance modifications to ensure that approved lot size variations enhance the protection of steep slopes and other environmentally critical areas when lot size averaging is employed in development or subdivision applications.
- c. **Limit impervious coverage.** Develop revisions or amendments to impervious coverage regulations in each zone district to provide consistency with the objectives of the NJDEP and Township stormwater regulations.
- d. **Consider overlay zoning.** Assess the use of overlay zoning for steep slopes, aquifer recharge areas, stream buffers and greenways as a mechanism for implementation of other Township goals including the Municipal Stormwater Management Plan Element of the Master Plan.
- e. **Improve conservation easement tracking.** Create a standard conservation easement tracking and monitoring system to be part of the responsibilities of the township administration, in order to monitor conservation easements. The tracking system could be managed as an addition to the Township's GIS, and the location of the conservation easements must be included as part of periodic updates of the Township Tax Maps. As part of submittal requirements for subdivision and site plan applications, include identification of conservation easements located on properties within 200 feet of the proposed projects. Design standards should promote linkages among protected areas as new conservation easements are granted.

**OBJECTIVE 2.** Promote enjoyment of and education about the environment in order to encourage environmental stewardship among residents, children and visitors.

*An educated citizenry committed to stewardship of the environment is a key factor to protecting and preserving the rich natural resources of the township for future generations. Education is the tool that will provide students, teachers, residents and visitors with stewardship knowledge and skills.*

#### Strategies

- a. **Promote public appreciation of the unique geology and the landscape it formed.** Inform and urge teachers to include instruction about the unique geological features of the township, for example, Shale Pit, volcanic rocks of the third Watchung Ridge, Loantaka Moraine (glacier outwash), Great Swamp (ancient Lake Passaic) in school curricula. Explore opportunities to partner with other organizations and agencies to expand environmental awareness and public involvement in protecting critical resources.
- b. **Promote conservation projects.** Promote environmental restoration or improvement projects on public and private lands.

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- c. **Promote watershed awareness.** Promote school instruction on the town watersheds and how rain water drains from school and home properties into storm sewers and brooks.
- d. **Expand open space access.** Create access areas to the Passaic River and other open space to allow greater use, enjoyment and appreciation of these resources.
- e. **Provide education on use of fertilizer and pesticides.** Refine and expand educational programs for residents about pesticide and fertilizer use.

**OBJECTIVE 3.** Ensure greater protection of surface water resources, including the Great Swamp, which covers one third of Township land, through regulatory and educational measures.

Chatham Township is fortunate in having a national wildlife refuge within walking or biking distance for many residents. Besides providing recreational resources for Chatham Township, the Great Swamp also supports a large diversity of plants and animals whose existence is critically dependent on the quantity and quality of the surface waters that flow from the township into the Great Swamp. In addition, a portion of the township lies above a major aquifer.

**Strategies:**

- a. **Reexamine stream buffer requirements.** Review and evaluate the consistency of current buffer requirements along streams to prevent increased flooding, promote infiltration, and protect water quality.
- b. **Develop a connected system of Greenways.** Create active and passive greenways, especially adjacent to water resources and stream buffers, to help protect surface water quality to provide water resource and habitat protection, and compatible recreational and educational activities.
- c. **Improve stormwater management.** Bring the current stormwater management plan into compliance with the new state stormwater regulations and implement the Township Municipal Stormwater Management Program. The NJDEP has required that all municipalities in New Jersey develop and implement stormwater management programs including a Stormwater Pollution Prevention Plan, Municipal Stormwater Management Plan, and adoption of a series of ordinances directed at improving stewardship of public property and stormwater control requirements for new developments. Compliance with these requirements should be accomplished within the context of the unique geography and resources of the Township.
- d. **Explore pesticide & fertilizer regulations.** Consider enacting an ordinance requiring 24-hour notice by commercial applicators and expand public education to adjacent neighbors when pesticides or fertilizers are to be applied to lawns, shrubs or trees. Promote dissemination of educational material regarding pesticides and alternative

lawn maintenance programs developed by the Board of Health and Environmental Commission.

**OBJECTIVE 4.** Protect groundwater resources.

An arm of the Buried Valley Aquifer known as the Chatham Valley Aquifer is located in a portion of Chatham Township. This is designated by the EPA as a "sole-source aquifer" because it supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer in a region with few or no alternative sources and where, if contamination occurred, an alternative source would be extremely expensive. Water entering the ground in the Township maintains stream flows during dry conditions (base flow) and also the hydroperiod of near and far field wetlands and open waters. The hydroperiod is "the seasonal occurrence of flooding and/or soil saturation, encompassing the depth, frequency, duration, and seasonal pattern of inundation" (Azusa & Homer, 1997). Changes in hydroperiod can interfere with current use of property and also with the existing downstream resources within the Great Swamp. Maintenance of the quantity and quality of recharge and management of surface water runoff are critical components of the Township's Municipal Stormwater Management Plan.

**Strategies:**

- a. **Improve pollution avoidance.** Review existing and planned land uses in commercial areas to identify potential release of pollutants, which would degrade groundwater quality and initiate preventive or mitigating action.
- b. **Implement the Township Municipal Stormwater Management Program.** The NJDEP has required that all municipalities in New Jersey develop and implement stormwater management programs including a Stormwater Pollution Prevention Plan, Municipal Stormwater Management Plan, and adoption of a series of ordinances directed at improving stewardship of public property and stormwater control requirements for new developments. Compliance with these requirements should be accomplished within the context of the unique geography and resources of the Township.
- c. **Explore pesticide & fertilizer regulations and expand public education.** Explore controls on commercial applicators of pesticides or fertilizers to be applied to lawns, shrubs or trees. Promote dissemination of educational material regarding pesticides and alternative lawn maintenance programs developed by the Board of Health and Environmental Commission.
- d. **Evaluate septic system design standards.** Evaluate the effectiveness of the present septic design standards and septic management plans in protecting ground water. Assess whether areas relying on septic systems have adequate lot area requirements.

- e. **Evaluate the appropriateness of extending sewers to unserved areas.** Review the environmental impacts of current septic areas and evaluate the need for sewer extensions and the economic and environmental impacts of sewer extensions.

**OBJECTIVE 5.** Conserve energy and improve air quality.

Preserving trees improves air quality through the production of oxygen and reduction of noise and thermal pollution. Air quality is also improved by reducing reliance on cars for all transportation, which also saves energy. Pollutants discharged into the air from many human activities include pesticides and herbicides.

**Strategies:**

- a. **Reduce reliance on automobile transportation.** Promote linkages between open spaces, recreational, and commercial areas with walkways, bikeways, and multi-purpose trails to encourage and promote alternate means of transportation.
- b. **Promote walking to school.** The health benefits of regular exercise argue in favor of increasing pedestrian movements, including those of pupils. Support for organized "walk-to-school" days and intra-grade/inter-school competitions for walk-to-school days helps to promote an awareness of the value of pedestrian movement for the environment and human health.
- c. **Develop bike trails and pedestrian amenities.** Seek grants and capital funding in order to develop bike trails and pedestrian amenities that enable residents to reach destinations through alternate means.
- d. **Improve energy efficiency:** Promote and encourage development of sustainable practices and policies, such as the use of energy efficient lighting and the incorporation of hybrid vehicles into the municipal fleet.
- e. **Reduce auto emissions.** Investigate ways to reduce traffic and discourage unnecessary vehicle idling.
- f. **Improve forest awareness.** Promote awareness of the Community Forestry Management Plan.
- g. **Promote public education offerings and public school curricula on sustainable lifestyle choices.**

**OBJECTIVE 6.** Preserve open space, vistas and scenic character and quality of life.

Pleasant views and open or wooded vistas are seen at many points along the length of major roads through the Township, including Fairmount Avenue, Green Village Road, Southern Boulevard, Loantaka Way, and the two-lane, western-most segment of Shunpike Road. The vista along Green Village Road still suggests the 18<sup>th</sup> and 19<sup>th</sup>

century, and Loantaka Way provides sweeping panoramas of rolling farm fields. The ridge along Fairmount Avenue affords breathtaking views to the west across the Great Swamp and east to New York City, especially when the leaves have fallen. In planning meetings residents have expressed the desire to preserve these vistas as contributing to the quality of life in the Township. For many, the scenic quality is a distinguishing feature that drew them here.

**Strategies:**

- a. **Encourage land acquisition.** Promote purchase or outright land donation of large tracts of land to capitalize on all of the benefits of open space.
- b. **Expand conservation easements.** Promote the establishment of conservation easements by publicizing the tax benefits of these preservation efforts and other benefits of open space.
- c. **Protect the Township's scenic character attributes.** Explore scenic vista and scenic corridor/area protection approaches and develop an inventory of the scenic character resources to be preserved. Develop design standards to protect these community assets by guiding the location and configuration of development, in order to protect the various categories of attractive views, including enclosed roadside views, extended roadside views, and distance views. An example would be placing structures at the edge of wooded areas, leaving open meadow, using clustering or lot size averaging as a technique. Explore the adoption of a scenic corridor/area overlay to protect the scenic character of contiguous properties with similar scenic attributes.
- d. **Enhance quality of life conditions within the Township.** Enforce the noise control regulations established in Township Ordinance BH-2-79, particularly with regard to gasoline powered devices, domestic power tools, loud music and operating hours for construction or demolition work.

**SUMMARY**

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, along with a program of mapping and monitoring. Additionally, open space and woodlands acquisition priorities should support the goals of the Conservation Plan.

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 21<sup>st</sup> century and beyond. This argues for 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 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. 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. Land development should be arranged to maximize the conservation of scenic vistas, fragile ecosystems and critical habitat areas, by limiting the location and extent of development and promoting effective conservation techniques.

Chatham Township's Environmental Commission and the Great Swamp Watershed Association have advocated for better land stewardship in the region. Land stewardship involves the actions of both landowners and government agencies. This Conservation Plan proposes the continuation and expansion of land stewardship efforts and outlines Chatham's strategies to meet the statutory purpose to preserve, conserve and utilize natural resources.

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 Ten Towns Committee, the Great Swamp Watershed Association and the

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Passaic River Coalition. The Township should continue to partner with these organizations to advance these efforts, and explore the creation of new programs through Township schools and agencies.