

Hunterdon County’s infrastructure network is a key determinant of growth—its pattern, location and intensity. Traditionally, we think of sewer lines, septic systems, water supply systems, roads and utilities—our “gray” infrastructure. But parks, open space and farmland - our “green” infrastructure” - influence growth as well. In general, green space is a draw for both residents and business because it contributes to the desired rural character of the County. But beyond that, public policy decisions to preserve land affect how and where future growth occurs.*

*Roads and farmland are addressed in separate sections of the County Profile.

County Profile—Infrastructure

Gray Infrastructure

Sewer Service Areas

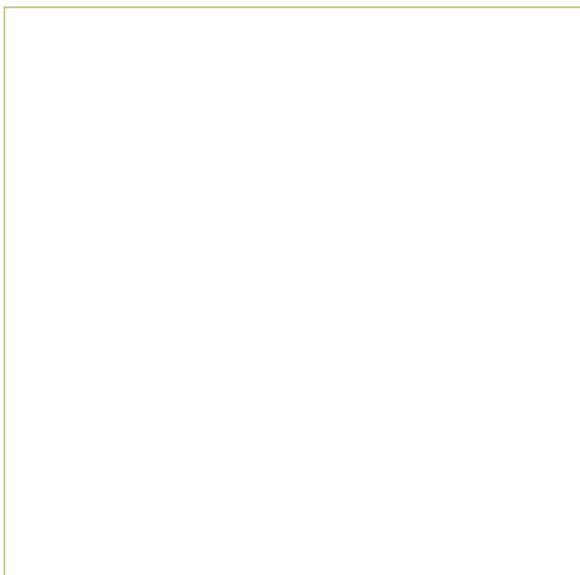
Sewage facility systems are one key determinant of the amount, location, and intensity of development. Hunterdon County saw the construction of its first municipal sewage treatment plant in the early 20th century. Several other plants came on line from the late 1950s to the 1970s. During the 1970s, the Federal government provided grants to help finance their construction. It is in these sewer locations that the more intensive development has occurred over time.

During the mid-1980s the Federal grant funding for wastewater treatment facilities was eliminated and replaced with a loan program. The elimination of the Federal grant program resulted in fewer municipal or regional wastewater treatment facilities being built and an increase in smaller, localized, development-specific wastewater treatment facilities constructed by developers. The time required to permit and construct a new wastewater treatment system can take anywhere from 3 to 7 years. Regional sewage treatment plants built in the 1970s served a very limited geographic area in Hunterdon County and are now at or near capacity with no plans to expand.

New treatment facilities must be consistent with the State’s Areawide Water Quality Management Plans (WQM Plans), which were designed to link population and growth demands and water quality with construction of new wastewater treatment facilities. Hunterdon County is within the Upper Delaware and Upper Raritan Areawide WQM Plans. Local Wastewater Management Plans (WMPs) become amendments to the relevant Areawide WQM Plans and provide local information that identifies existing and future sewer service areas (Map 1). These local WMPs identify future sewer areas where higher density and smaller lot sizes can be accommodated.

Local WMPs in Hunterdon County show very few future sewer areas. Nearly 80% of the County households rely on individual, on-site septic disposal fields for sewage treatment. Development patterns prior to the 1980s show concentrated development around small central locations and along highway corridors. Since then, the development pattern has become spread out over the rural landscape of the County. Municipalities have favored zoning for large-lot developments with on-site wells and septic disposal fields to slow development and preserve rural character.

Septic systems are designed to treat wastewater and allow infiltration back into the ground. The NJ Department of Environmental Protection (NJDEP) regulates the issuance of New Jersey Pollutant Discharge Elimination System (NJPDES) and Discharge to



Photo

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Ground Water (DGW) permits that are required for facilities whose discharge exceeds 2,000 gallons per day. There are currently five wastewater treatment plants with service areas beyond one municipality.

The **Raritan Township Municipal Utilities Authority Sewerage Treatment Plant**, located in Raritan Township, is the largest public sewage treatment facility in the County. Its design capacity is 3.8 mgd (million gallons per day) and current usage is approximately 2.8 mgd. It serves areas in Raritan Township, the Three Bridges area of Readington Townships, and the Borough of Flemington. An additional 1,800 persons can be served with the current reserved, unused capacity. There are no plans to expand the plant at this time.

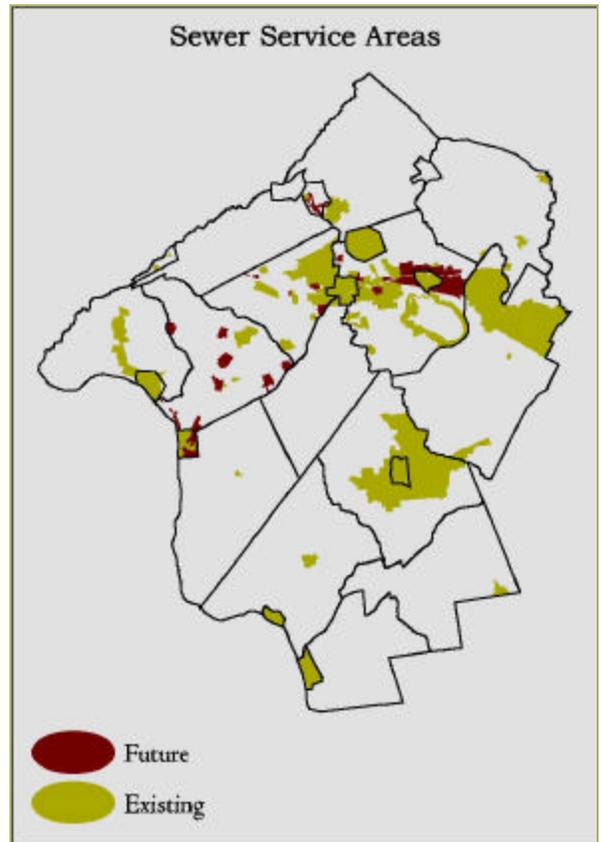
The **Town of Clinton Sewerage Treatment Plant** is a public facility currently serving the Town of Clinton, High Bridge, and some areas within Clinton, Franklin, Lebanon and Union Townships. Its design capacity is 2.03 mgd. While the plant's existing capacity is fully allocated, it is operating only at about 60% of its design capacity, with no plans for expansion.

The **Lambertville Sewerage Authority Pollution Control Facility** is a public facility currently serving Lambertville (51%), Stockton (7%), and portions of Bucks County, PA (42%). It is located in the City of Lambertville and has a design capacity of 1.5 million gallons per day. In 1999 the average daily flow was 0.76 mgd, with additional capacity available to serve approximately 1,200 new households. However, there are no plans to expand the facility.

The **Readington-Lebanon Sewage Authority** is a public facility located in Readington Township. It serves the Whitehouse area of Readington Township, Lebanon Borough, and the Round Valley Recreation Area. Design capacity is 1.2 mgd with an average annual flow of about 0.65 mgd. There are no plans to expand the plant at this time.

The **Milford Borough Sewer Treatment Plant** is a public facility currently serving Milford Borough and portions of Holland Township. It has a design capacity of 0.4 mgd and average daily flows in 1999 were about 65% of capacity. All of the existing capacity has been allocated between these two municipalities and there are currently no plans for expansion.

There are 26 NJPDES-permitted facilities in Hunterdon County. These include the five larger municipal facilities mentioned previously and 21 smaller facilities: two municipal facilities, six schools, one group home, one camp, two State institutional facilities, seven homeowners association and two village facilities.



Map 1. Sewer Service Areas.

Primary data sources: NJDEP, NJ Water Supply Authority, Municipal Wastewater Management Plans. Note: Map shows sewer systems serving residential facilities and schools. Some of these areas also serve nonresidential uses.

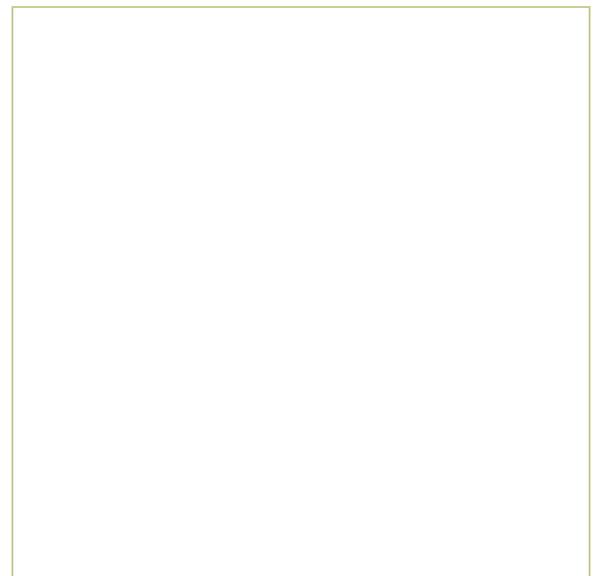
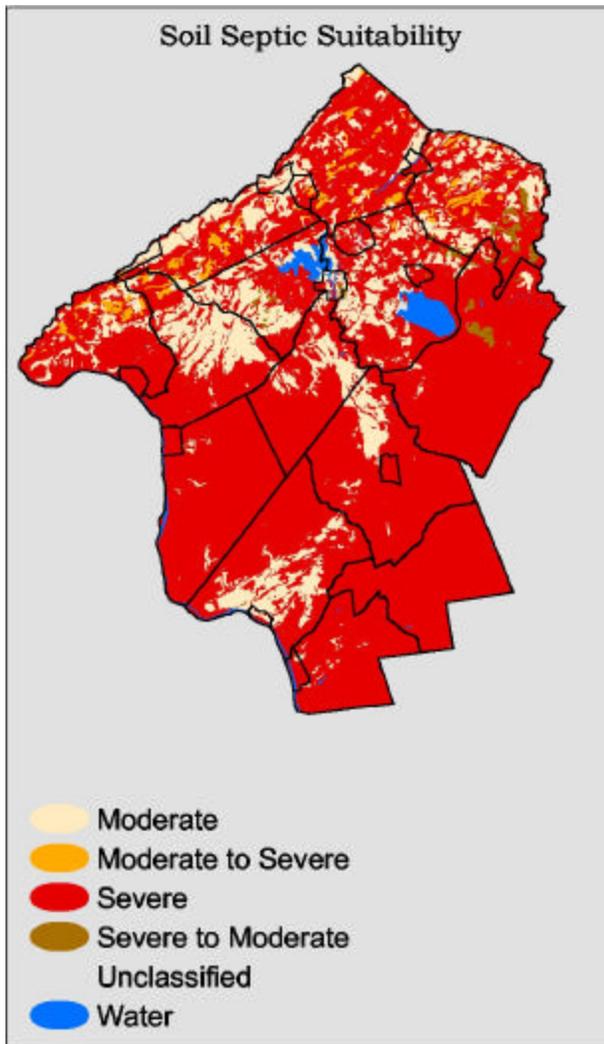


Photo. Sewerage Treatment Plant

County Profile—Infrastructure



Map 2. Soil Septic Suitability

Primary data source: NRCS

Note: The classification “severe to moderate” indicates that there are two soil components within a given soil unit and the dominant soil has severe limitations.

The smaller permitted facilities were sized and built to serve a specific project with no plans to expand beyond the original design capacity.

The cost of expanding existing facilities and a current desire to preserve open space and enhance rural character has led to discussions of other available wastewater treatment options. One such alternative to the individual on-site septic disposal system is a community wastewater treatment system. Community systems allow for developed lot sizes of less than one acre and the preservation of open space by clustering development and preserving large tracts of land. In addition, they provide 95% removal of biodegradable contaminants, compared to 50% removal by septic systems.

Municipalities have control over sizing and locating these facilities through their WMPs. However, very few are built today, due to a variety of public concerns. (see Land Development Profile for additional discussion).

Septic Systems and Septic Suitability

The traditional soil septic suitability analysis is an investigation of soil characteristics for their ability to support subsurface wastewater disposal facilities, that is, septic systems. This is an important issue in Hunterdon County, where approximately 80% of the County households rely on individual septic systems.

Traditional soil analysis results in a map that indicates those areas with slight, moderate and severe septic limitations (Map 2). Septic suitability limitations in Hunterdon County are based on physical features, such as flood hazard, permeability, depth to seasonal high water table, depth to and kind of bedrock, slope, stoniness and rockiness. However, new development occurs even in areas with moderate or severe limitations because State regulations allow for different types of individual on-site systems that will address many of these limitations. Therefore, a different approach to septic suitability analysis shows those systems that are the minimally acceptable installation types, based on State regulations, and that are generally the most cost-effective type of installation for the soils present on site (Map 3).

Individual subsurface sewage disposal systems are regulated through the NJDEP’s Subsurface Sewage Disposal Systems Standards which were last modified August, 1999. Until the revisions of 1990, the conventional septic system was the only approved septic system; any other system type had to have specific approval from NJDEP. The changes to the standards in 1990 allowed for conventional installations and several additional installation types.

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Each of the new systems can use select fill material to meet infiltration requirements. Routine maintenance and predicted life of these new system installations is expected to be similar to the conventional installation. However, the new installations are only 11 years old and only time will reveal their true limitations.

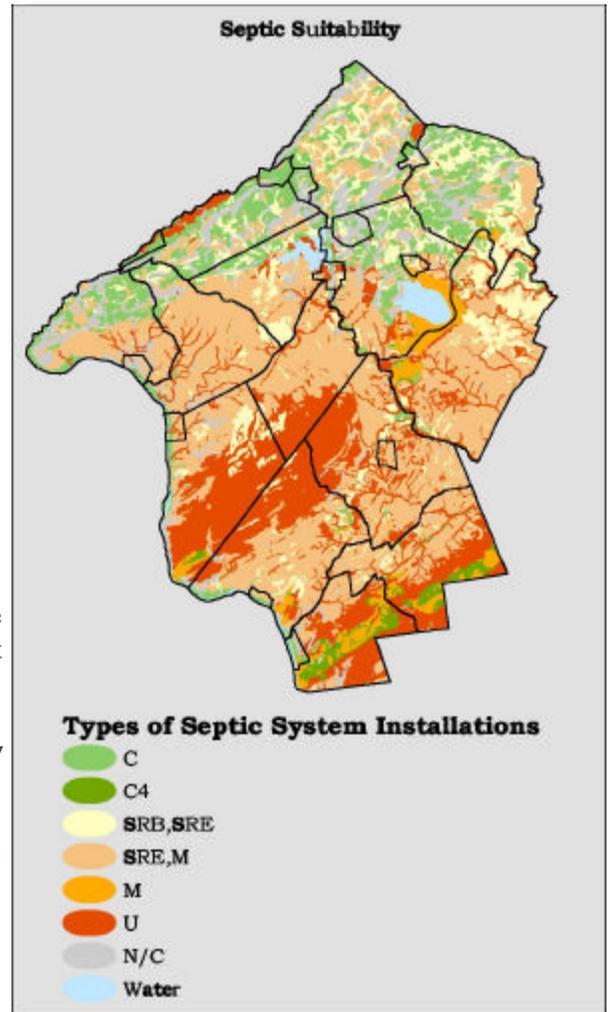
The new engineering designs allow different types of disposal system installations but also include expanded requirements. For example, the disposal bed size was increased by about 30% and the use of select fill for maximum drainage benefit was instituted. The major emphasis prior to the 1990 change was on disposal of sewage into the ground. The regulation change shifted the emphasis to ground water protection and disposal practices that ensure water quality, especially with regard to attenuation of bacteria. However, septic systems that function properly may nonetheless discharge some pollutants. If septic densities are too high, nitrate levels in the ground water could pose a public health threat and ecosystem threat (see Natural Resources Profile for discussion on nitrate dilution). Viruses may still be an issue as well. This is addressed not through the existing septic system regulations, but rather, through the Realty Improvement Act for developments of more than 50 units.

Finally, the statute specifies minimum separation distances between the septic field location and surrounding structures, property lines, wells or natural features. It also specifies that no septic field can be located where the slope is greater than 25%. However, areas subject to surface flooding and areas of freshwater wetlands are the most restrictive features when locating a septic field.

Water Supply

Water supply has become an increasingly important concern across the State, with a prolonged period of dry weather and reduced rainfall since 1998. Hunterdon County's drinking water supply comes from surface and ground water sources. More than 70% of the households in Hunterdon County depend on ground water via individual wells for their water supply. In addition to individual residential wells, there are permitted public-community wells as well as non-community wells (for example, schools, offices, restaurants, institutions, etc.).

According to the New Jersey Statewide Water Supply Plan (NJSWSP, August 1996), Hunterdon County has a total water supply availability of 117 million gallons per day (MGD). This includes 66.7 MGD from surface water supplies (most of which is transferred out of County from the D&R Canal) and 50.3 MGD of ground water supplies for in-County use. New figures, both on availability and also on current and projected water use should be included with the release of the next Statewide Water Supply Plan.



Map 3. Septic Suitability - Technology-Based.

Primary data source: Natural Resources Conservation Service (NRCS); N.J.A.C. 7:9A.

Note: Based on the minimally-acceptable and generally the most cost-effective technologies, given soil limitations and State regulations. Nonclassified soil types generally cannot be assigned a soil suitability class due to extreme variability or a lack of data.

C=Conventional Installation

C4 = Conventional Installation w/Curtain Drain

SRB= Soil Replacement Bottom Lined

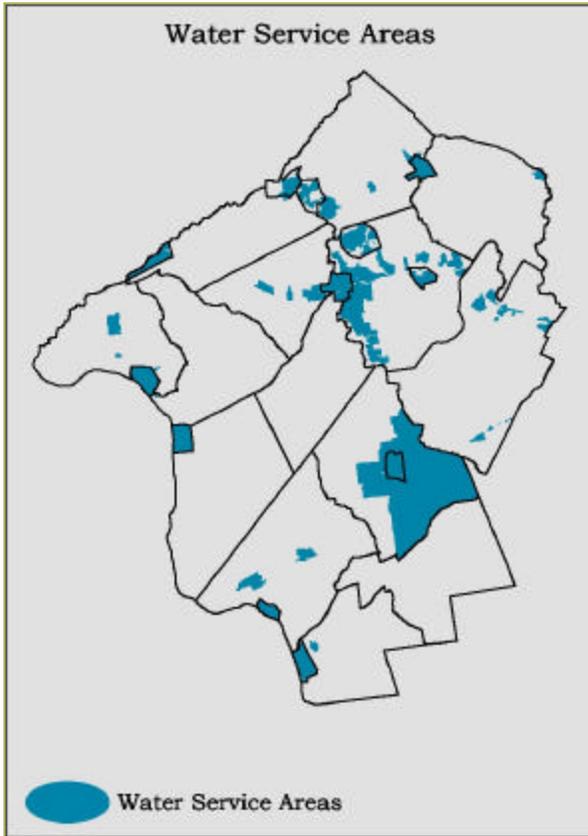
SRE= Soil Replacement Fill Enclosed

M= Mound System

U= Unsuitable for any type of installation

N/C= Nonclassified soil type

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Map 4. Water Supply Service Areas, Hunterdon County, NJ.

Primary data source: NJDEP.

Round Valley and Spruce Run Reservoirs are two additional major water supplies located in Hunterdon County, with storage capacity of 55 and 11 billions gallons respectively. This makes them two of the largest reservoirs statewide. The two reservoirs, together with the D&R Canal, collectively serve 1.2 million people in central New Jersey. While most users live outside of Hunterdon County, care must be taken within their watersheds to ensure that a healthy, clean water supply is maintained. The New Jersey Water Supply Authority is leading efforts within the Spruce Run Reservoir watershed, in cooperation with four municipalities, to identify lands most important from a preservation standpoint and to identify effective land use and stormwater management practices.

Water Purveyors in Hunterdon County

NJDEP regulates all ground and surface water diversions in excess of 100,000 gallons of water per day by issuing water allocation permits. This includes not only potable water supply uses but also any other public water supply purposes, industrial purposes, irrigation, sand and gravel operations, remediation and power generation. Agricultural uses capable of withdrawing more than 100,000 gallons per day must also obtain permission from the County agricultural agent.

There are currently 49 public water supply wells in Hunterdon County that serve 17 permitted water supply companies. In addition, Elizabethtown Water Company draws water from the Round Valley/Spruce Run Reservoirs and is permitted through NJDEP. United Water Lambertville draws from the Lambertville Reservoir with no NJDEP permit because it existed before the current regulations were adopted. Water supply service areas are locations where purveyors currently serve customers or where municipalities have designated locations for public water supplies in their master plans (Map 4).

Elizabethtown Water Company, by far the largest investor-owned supplier of public water in Hunterdon County, serves areas of Tewksbury, Raritan, Readington, and many municipalities outside Hunterdon County. Its water source is from Round Valley and Spruce Run Reservoirs as well as the D&R Canal and public water supply wells in Hunterdon and surrounding counties. Elizabethtown has approximately 3,600 service connections and serves a population of approximately 11,000 within Hunterdon County. Elizabethtown's franchise area, or permitted potential service area, covers all of Raritan Township, and the area of Readington Township along the US22 Corridor and the area south of US202.

The Town of Clinton Water Department services the Town of Clinton as well as areas of Clinton and Union Townships. It has approximately 3,380 service connections and serves approxi-

Photo. Round Valley Reservoir

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mately 10,000 people. The Town has eight active wells and its current NJDEP allocation is for 1.6 MGD. Clinton has requested from NJDEP an additional permit to increase its water allocation by 432,000 gallons per day by adding one new well.

Consumer NJ Water Company serves approximately 750 households in Califon, a small portion of Lebanon Township, and three communities in Holland Township (Fox Hill Condominiums, Riegel Ridge, Hughesville). It operates nine existing wells. The remaining water supply companies serve small villages and boroughs.

Electricity

As of August 1, 1999, the State of New Jersey took its first steps toward complete deregulation of the electric industry with the enactment of the Electric Discount and Energy Competition Act. Proponents of deregulation maintain that the replacement of natural monopolies held by large utility companies with independent suppliers in direct competition with one another will make pricing more representative of the true costs of generation and transmission, which had begun to exceed retail revenues. As such, consumers of electricity within Hunterdon County now have the option of choosing an electricity supplier other than JCP&L (formerly known as GPU Energy and subsidiary of First Energy Corp.) even if the supplier is located across state lines. Consumers of electricity in Hunterdon County currently have a choice between 22 competitive suppliers.

Since rate caps will not be removed until August 1, 2003, it is difficult to know how deregulation will affect electricity prices in New Jersey. Proponents say prices will be reduced for all consumers of electricity whereas critics say prices will decrease for big business only with price increases for residential consumers. Big business as a whole seems to be the strongest proponent of electricity deregulation.

If no specific supplier is chosen then the default supplier will remain JCP&L. The New Jersey Board of Public Utilities is currently considering the methods that will be used to determine generation prices for customers who do not choose to buy from a competitive supplier. Approximately 97% of New Jersey households and businesses have not chosen an alternative electric ity supplier. Regardless of the particular supplier, transmission and delivery will remain the domain of JCP&L.

Generation Methods

JCP&L utilizes three main energy sources in the generation of its electricity. Forty-seven percent of JCP&L electricity is nuclear, 24% is gas generated, and 22% is coal generated. Only 4% comes from renewable resources. Environmentally conscious consumers who do not wish to purchase electricity derived from these sources can choose a supplier that uses alternative generation methods such as solar or wind power.

Power Shortages

New Jersey utilities are part of the PJM (Pennsylvania-Jersey-Maryland) interconnection, which manages electric generation supply and bulk transmission in those regions. Unlike California where little or no new capacity has been built in the last decade, the PJM region has experienced the addition of a substantial amount of new capacity. Over the next several years additional planned generation projects are anticipated to become operational. As such, New Jersey is not likely to encounter the same shortages encountered by California in the summer of 2001. Since very little generation in PJM is based on hydroelectric plants, drought conditions should have minimal impact on power output. Other plants that require water for operation have taken steps to reduce water usage while still maintaining the ability to operate at needed levels. Nonetheless, the experience in California suggests the value in proactive measures to prevent such occurrences in the future.

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Green Infrastructure

Hunterdon County residents have a long-standing commitment to open space and farmland preservation. In 1980, they supported the County's first bond referendum (\$2.2 million) for agricultural preservation. In 1993, results from a public opinion survey conducted by the Hunterdon County Planning Board indicated that 54% of respondents were willing to pay higher taxes for farmland and open space. In 1998, Hunterdon County voters approved the Garden State Preservation Trust Act, which provides a stable source of funding statewide (\$1—\$2 billion for farmland, open space and historic preservation through the year 2009). A year later, voters approved a ballot question in Hunterdon County calling for a dedicated tax for farmland, open space and historic preservation. The County tax will remain in effect until 2004, at which time another ballot question may be posed.

Photo. Musconetcong Gorge—a Bioregion Preserve

Parks, Open Space and Recreation in Hunterdon County

Today, Hunterdon County has nearly 30,000 acres of parks, open space and recreational lands, exclusive of land preserved through the State Farmland Preservation Program. Roughly 75% consists of publicly held lands. The remainder includes property of non-profit conservation organizations, homeowners associations or individuals who have deed restricted their property from further development (Table 1 and Map 5). These lands comprise environmentally sensitive areas, active and passive recreational lands, farmland and other dedicated open space areas. In total, protected open space represents 10% of the County's land base.

County-owned Parkland

Hunterdon County obtained a 15-acre property in Delaware Township through a private donation in 1966. Six years later, an additional donation of 66 acres occurred. In 1973, the Hunterdon County Park System was created and the donated property, now called the Wescott Preserve, represented the first parkland acquisition. Today, the Hunterdon County Park System maintains 5,900 acres of parkland. The County's park system consists primarily of lands set aside for passive recreational use. Steep topography, woodlands, and wetlands are common features of County parks and afford opportunities for nature observation, hiking and related activities. Deer Path Park and Heron's Glen Golf Course provide the primary locations for active recreation.

Photo. Heron Glen Golf Course—a Special Use Park

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The Park System has identified six bioregions into which its various parks fall. Bioregions are discrete physical regions. Each contains unique physiographic and biological features which create these six distinctive landscapes. Parks are located within these bioregions and are classified as follows (Map 6):

- Bioregion Preserves – exemplary of the distinct physiographic and biological features of the County’s bioregions.
- Improved Natural Areas – minimally developed to accommodate off-street parking, trails, rest rooms, campgrounds and picnic facilities
- Linked/Greenways – corridors with natural features along rivers, streams or abandoned rail lines which are part of a linked open space system featuring rails and limited development
- General Use Parks – developed for active and passive recreation and made available for general public use
- Special Use Parks – developed for one or several unique uses, requiring special care and made available for public use in a controlled manner.

County Recreational Facilities

The Hunterdon County Park System maintains 23 parks. These are primarily passive use areas, offering hiking, biking, and horse trails. Most offer hunting and fishing as well. Some contain parking areas, picnic areas and nature study areas. Deer Path Park, a general use park in Readington Township, has a softball field and two soccer fields. In addition, Heron Glen is a 240-acre County-owned golf course that has also opened in Raritan Township in 2002. The County has also acquired a 44-acre property in East Amwell Township. This will host future annual County agricultural fairs and may also host horse and dog shows and community events. Although park properties are located throughout the County, the majority are found in Raritan, Readington, Clinton and Lebanon Townships at present.

The National Recreation and Park Association (NRPA) developed a guideline for calculating acreage of government-held open space to be used for active recreation. This guideline, called the Population Ratio Technique, relates recreational land needs to existing and projected population. According to the guideline, a County Park System should offer 12 acres of active recreation land per 1,000 people. Presently, the Hunterdon County Park System has 704 acres of active recreation areas. According to the NRPA guideline, it is deficient by nearly 800 acres. Given a projected population of 160,797 in 2020, the need for active recreational land would escalate to 1,930 acres. The Hunterdon County Park and Recreation Master Plan calls for an additional 1,100 acres of active recreation parks. However, 300 acres are located on a property that is currently under review as an affordable housing development.



Photo. Deer Path Park—General Use Park

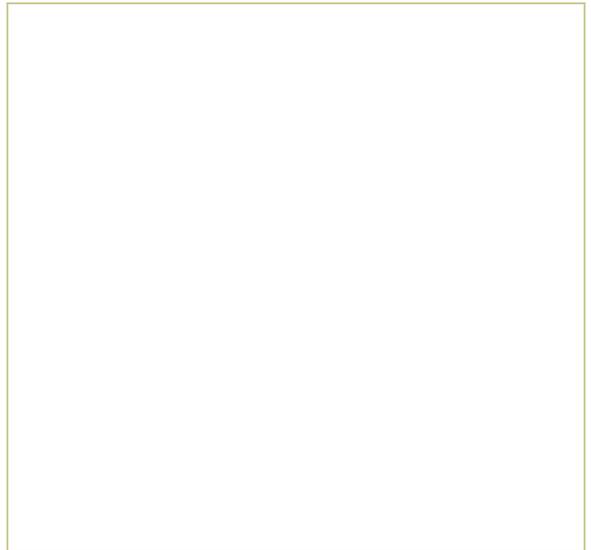


Photo. South Branch Reservation—Greenway Trail

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Category	Acreage
Board of Education	1,038
Common Open Space	2,899
County-owned	5,900
Farmland Conservation Areas	2,200
Municipally-owned	4,020
Nonprofit Organization	3,013
Private Open Space	387
State-owned	10,295

Table 1. Parks and Open Space, Hunterdon County, NJ.

Note: Common open space is open land maintained by homeowner associations. Farmland Conservation Areas are preserved properties currently farmed but not subject to the deed restrictions required under the State Farmland Preservation Program.

Park Classification	Existing Holdings (Acres)	Future Total Holdings (Acres)
Bioregion Preserves	1,316	9,816
Improved Natural Areas	2,137	3,885
Special Use Parks/General Use Parks	1,810	2,910
Linked Greenways/Trails	107*	907*

Table 2. Hunterdon County Park System Priorities. Source: Hunterdon County Park System.

*In addition, the South Branch Reservation is a 645-acre trail system included under Bioregion Preserves. Proposed future holdings total 1,000 acres. Note: Existing holdings have been increased since the time this table was created.

The NRPA Population Ratio Technique may be a useful guideline for general planning purposes but it fails to account for a variety of locally unique factors, which could influence active recreation needs in any given county. For example, demographic data such as age and disposable income, and valid resident-based recreational needs surveys are important considerations in planning for active recreational acreage. Also, many active recreational facilities are more appropriately provided for at the municipal level. *The 1994 – 1999 New Jersey Open Space and Outdoor Recreation Plan Summary* indicates that municipalities in New Jersey provide far more outdoor sports facilities and swimming pools than do counties. Conversely, counties tend to offer more golf courses, horseback riding facilities, environmental centers, campsites and picnicking facilities. The Hunterdon County Board of Chosen Freeholders recently charged its Parks and Recreation Advisory Board to conduct a recreational facilities needs assessment for the county so that needs and priorities unique to Hunterdon County can be identified.

Park Acquisition Priorities

Park system acquisitions have generally emphasized the need to maintain biodiversity, enhance watershed protection efforts, and sustain water quality. These priorities reflect the framework of the Hunterdon County Park and Recreation Master Plan (2000), which suggests the following major directions for future county parks:

- Preserving the natural environmental features and values that define Hunterdon County's landscape
- Providing programs and facilities that allow the public to fully experience nature and enjoy outdoor recreation activities in Hunterdon County.

In addition, the Park System is interested in sites for future regional-scale recreation activities.

The Hunterdon County Park and Recreation Master Plan (2000) calls for a future park system consisting of 17,520 acres or approximately 6.5% of the County's land base. The majority of parks are envisioned as bioregion preserves (Table 2 and Map 5). However, 645 acres designated as bioregion preserves also qualify as greenways and trails.

The Plan also envisions preservation of additional lands within designated conservation zones and greenway corridors. Since the County alone cannot possibly preserve and manage the extensive area identified in the Plan, it recommends working collaboratively with other government agencies, nonprofit organizations and private property owners to preserve these lands. They would then fall under the responsibility of these other entities.

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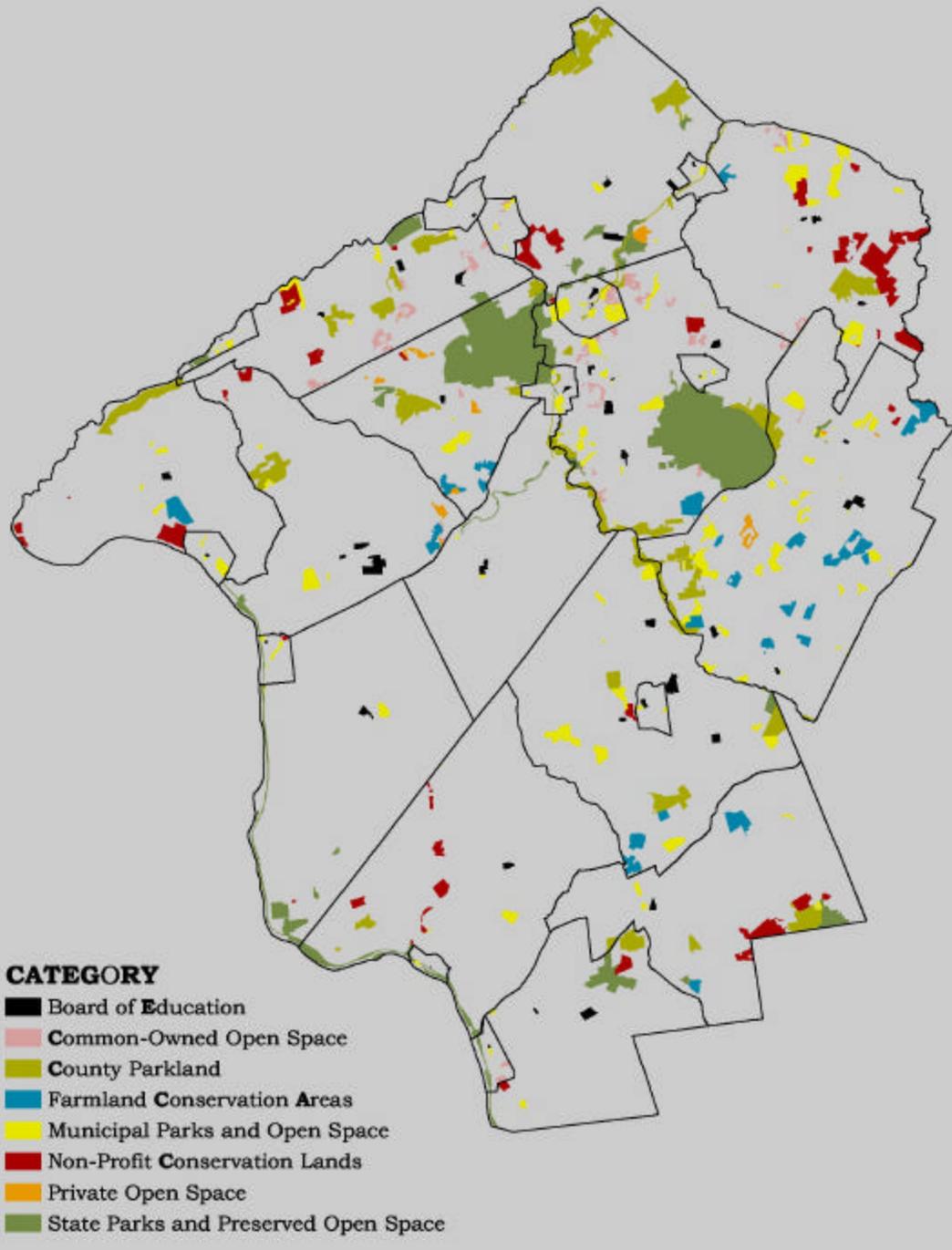
Financing Open Space and Parkland Acquisitions

Prior to the passage of the Hunterdon County Open Space, Recreation, Farmland and Historic Preservation Trust Fund in 1999 (Hunterdon County Open Space Trust Fund), the County spent over \$23.5 million from capital funds on the purchase of approximately 5,400 acres of parkland. Most of these purchases were in fee simple, rather than easements, and averaged \$4000 per acre in County contributions.

The dedicated Open Space Tax, which went into effect in 2000, allows the County to raise up to 3 cents per \$100 equalized assessed value for farmland preservation, open space preservation and the preservation of County-owned historic structures. Detailed policies on how to spend its tax dollars are spelled out in the *Hunterdon County Open Space, Farmland, and Historic Preservation Trust Fund Plan*. In 2000, \$3.6 million was generated by the tax. The following year, it increased to \$4.2 million. Thus far, \$2.8 million of these tax dollars has been allocated to the acquisition of 378 acres of new County parkland. In addition, \$770,000 has been made available to municipalities for local parks, open space and farmland preservation projects, and \$770,000 has been made available to qualified nonprofit conservation organizations for open space acquisitions.

Hunterdon County has been able to leverage its funding for parkland acquisitions by taking advantage of low interest loans and grants offered through the NJDEP Office of Green Acres. More recently, its policy has been to maximize funding opportunities by seeking additional and creative partnerships with other entities, such as municipalities and nonprofit organizations. This becomes particularly imperative, given projected costs of parkland acquisitions over the next 8 to 10 years. The Hunterdon County Park and Recreation Master Plan anticipates the need for \$80 million in future expenditures - \$7,000/acre - to acquire nearly 12,000 acres of parkland. This is estimated at present day costs and will invariably increase as time and market pressures continue to influence land values.

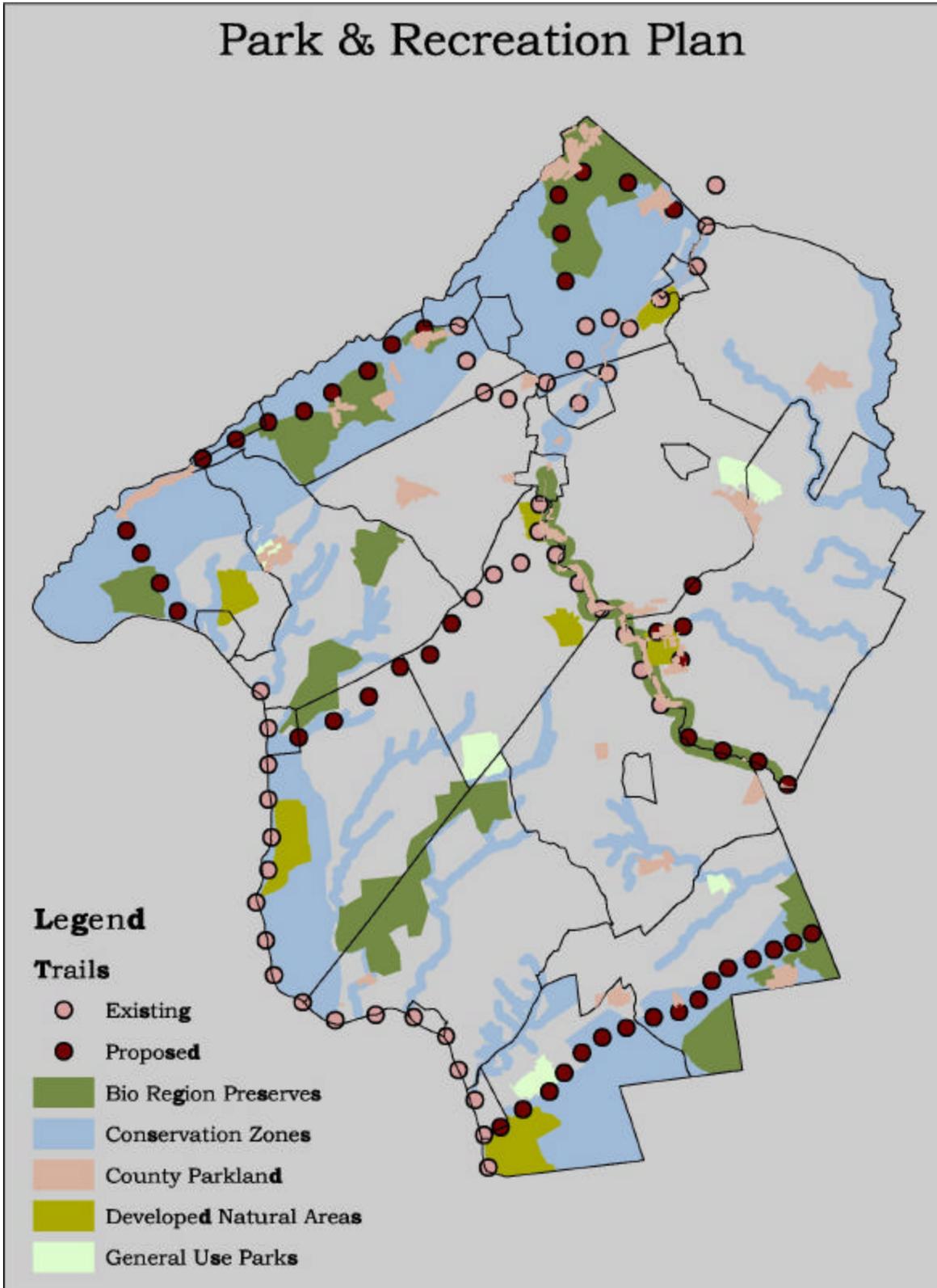
Parks and Preserved Open Space



Map 5. Parks and Preserved Open Space, Hunterdon County, NJ.

Primary data sources: Municipalities, Hunterdon County Park System, nonprofit organizations, NJDEP. Note: Farmland Conservation Areas are preserved properties currently farmed but not subject to the deed restrictions required under the State Farmland Preservation Program. Also note that Board of Education properties are not necessarily *preserved* open space.

Park & Recreation Plan



Map 6. Hunterdon County Park System Priorities.
Primary data source: Hunterdon County Park System.