
MUSCONETCONG RIVER

NATIONAL WILD AND SCENIC RIVERS STUDY



RIVER MANAGEMENT PLAN

Prepared by:
Musconetcong Advisory Committee
Musconetcong Watershed Association
Heritage Conservancy
National Park Service

April 2003

The views and conclusions contained in this document are those of the authors and should not be interpreted as representing the opinions or policies of the U.S. Government. Mention of trade names or commercial products does not constitute their endorsement by the U.S. Government.

Executive Summary

This management plan proposes a strategy for managing the Musconetcong River and its many outstanding resource values. It was prepared as part of a study to evaluate the Musconetcong River for inclusion in the National Wild and Scenic Rivers System.

The Musconetcong River drains a 157.6 square mile watershed area in northern New Jersey, and as a major tributary to the Delaware River, is part of the 12,755 square mile Delaware River watershed. For its entire length the Musconetcong River is a boundary water, first dividing Morris and Sussex counties, then Hunterdon and Warren counties. All or portions of 26 municipalities lie within the natural boundaries of the Musconetcong watershed. Fourteen municipalities fall within the river segments eligible for National Wild and Scenic Rivers designation.

The impetus for the Musconetcong National Wild and Scenic Rivers study can be traced back to 1991 when petitions were circulated calling for the protection of the Musconetcong River under both the National Wild and Scenic Rivers System and New Jersey Wild and Scenic Rivers program. In 1992 Congress passed legislation authorizing the National Park Service to study the eligibility and potential suitability of the Lower Delaware River for addition to the National Wild and Scenic Rivers System.

The Musconetcong Watershed Association (MWA) was formed in 1992 and in 1993 the MWA and the National Park Service (NPS) organized two Roundtable Meetings to discuss the problems, amenities and opportunities associated with the Musconetcong River. In 1995, the New Jersey Department of Environmental Protection (NJDEP) Office of Natural Lands Management recommended to the NPS that the Musconetcong River be included in the Nationwide Rivers Inventory of "candidate" rivers that are considered to have the appropriate characteristics for wild and scenic designation. Two years later, 18 of the 19 municipalities along the river voted to request the NPS to study the Musconetcong River to determine its eligibility and suitability for inclusion in the National System.

A Musconetcong Advisory Committee, consisting of municipal representatives was formed to work with the NPS and the Musconetcong Watershed Association in completing the National Wild and Scenic study. It was agreed by all parties that the Musconetcong Advisory Committee and local municipalities would have the final say as to whether the Musconetcong River is recommended for designation. The study area included the main stem of the river and the river corridor from the outlet at Lake Musconetcong to the Delaware River, a distance of approximately 42 miles.

An *Eligibility and Classification Report*, completed in August 1999, recommended that three segments of the river, representing 28.5 miles of river, were eligible for inclusion in the National Wild and Scenic Rivers System based on flow characteristics and natural and cultural resources. Next, an analysis of land ownership, land use regulation and physical barriers to development in the river corridor was completed to determine the effectiveness of existing mechanisms in management of the river and its

outstandingly remarkable values, and to identify gaps which could be addressed by the implementation of a comprehensive management plan.

Development of a river management plan is a requirement of the National Wild and Scenic Rivers study. This management plan was the result of cooperative efforts of the Musconetcong Advisory Committee, Musconetcong Watershed Association, Heritage Conservancy, the National Park Service, and a variety of local, county and state representatives. The management plan sets forth five major goals and recommends actions to maintain and improve the Musconetcong River corridor, its tributaries and watershed, and surrounding natural, cultural and recreational resources.

- Goal 1.** Encourage recreational use that is compatible with the preservation of natural and cultural qualities of the river corridor while respecting private property.
- Goal 2.** Preserve and protect the character of archaeological sites and historic structures, districts, sites, and landscapes in the river corridor.
- Goal 3.** Preserve farmland and open space within the river corridor and the watershed.
- Goal 4.** Preserve, protect, restore and enhance the outstanding natural resources in the river corridor and the watershed, including rare and endangered species, forests, steep slopes, floodplains, headwaters and wetlands.
- Goal 5.** Maintain existing water quality in the Musconetcong River and its tributaries and improve where possible.

Successful implementation of the management plan will require cooperation between all levels of government, individual landowners and non-governmental organizations. The plan recognizes that local municipalities play a key role in implementing the recommended management actions.

Table of Contents

Executive Summary	i
I. Introduction and Background	1
Wild and Scenic Rivers Act.....	1
Requirements for Designation	1
Musconetcong Study Background.....	2
Study Approach	3
Study Goals	4
Public Involvement	4
New Jersey Watershed Planning Process.....	5
II. Eligibility and Classification	7
Eligibility and Classification Methodology	7
Eligibility and Classification Findings	9
Outstandingly Remarkable Values	10
Segment-by-Segment Analysis	11
III. River Management Framework	12
Committee Membership	12
Funding and Staff.....	12
National Park Service Role.....	13
IV. Resource Management	18
Recreational and Scenic Resources	18
Historic and Archaeological Resources	22
Farmland and Open Space Preservation.....	27
Natural Resources.....	30
Water Quality.....	34
Summary of Recommendations for Local Governments	37
Glossary.....	38
Bibliography	42
List of Participants.....	43
Appendix A: Regulatory and Non-Regulatory Programs.....	44
Appendix B: Analysis of Existing Resource Protection	52
Maps	
Eligible River Segments	
Open Space & Recreation Lands	
Historic & Scenic Resources	
NJ State Plan Areas	
Land Use and Land Cover	
Important Habitats & Natural Areas	

I. Introduction and Background

National Wild and Scenic Rivers Act

The National Wild and Scenic Rivers Act (Public Law 90-542, as amended) was enacted in 1968, to balance long standing federal policies that promoted the construction of dams, levees, and other river development projects with a program that would permanently preserve selected rivers, or river segments, in their free-flowing condition. Section 1 (b) of the Act states:

“It is hereby declared to be the policy of the United States that certain selected rivers of the Nation, which with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, shall be preserved in a free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.”

The original Act designated eight rivers as components of the National Wild and Scenic Rivers System, and specified processes by which other rivers could be added to the system. Rivers may be designated either through an act of Congress (by amending the National Wild and Scenic Rivers Act) or through an administrative action by the Secretary of the Interior upon application by the governor of the state through which the river flows.

As of November 2001, one hundred sixty two rivers or river segments totaling 11,600 miles had been included in the national system. Only seven of these rivers are National Park Service “Partnership” Wild and Scenic Rivers. These rivers are: the Great Egg Harbor River and the Maurice River in New Jersey; the Lower Delaware River in Pennsylvania, and New Jersey; the White Clay Creek in Delaware and Pennsylvania; the Farmington River in Connecticut; the Lamprey River in New Hampshire; and the Sudbury, Assabet and Concord River segments in Massachusetts.

A National Park Service partnership river is one in which no federal agency, including the National Park Service (NPS), owns land or can acquire land within the designated wild and scenic river corridor. Rather, the NPS serves as a partner with local landowners, municipalities, county, state governments and non-governmental organizations (NGOs) in collectively managing a river, so that the river retains the outstandingly remarkable values for which it was initially designated. The NPS will not acquire or own land in the Musconetcong River watershed.

Under sections 7(a) and 10(a) of the National Wild and Scenic Rivers Act, all designated rivers receive protection from federally assisted projects, including projects funded, licensed, or sponsored by the federal government, which would alter the rivers’ free-flowing condition or have a direct and adverse effect on the rivers’ outstanding resources.

Requirements for Designation

Before a river can be added to the National Wild and Scenic Rivers System, it must be found to be both eligible and suitable. To be eligible, the river must

be i) free flowing; and ii) possess at least one “outstandingly remarkable” resource value, such as exceptional scenery, recreational opportunities, fisheries and wildlife, historic sites, or cultural resources. The resource values must be directly related to or dependent upon, the river.

If found eligible, a candidate river is then analyzed to determine its current level of development and a recommendation is made regarding the river’s proposed classification. The classification is based on the intensity of human presence along the river corridor. The Act defines the three classifications as follows:

- Wild Rivers:** Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- Scenic Rivers:** Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.
- Recreational Rivers:** Those rivers or section of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

The suitability determination is based upon several findings. First, there must be evidence of lasting protection for the river’s free-flowing character and outstanding resources, either through existing mechanisms (including patterns of conservation land ownership, state and local land use regulations, physical barriers to inappropriate development, etc.) or through a combination of existing and new conservation measures resulting from the National Wild and Scenic Rivers study. Second, there must be strong support for designation from the entities – local municipalities, state agencies, riverfront landowners, and conservation organizations – that will be partners in the long-term protection of the river. Third, a practical management framework must be devised that will allow these interests to work together as effective stewards of the river and its resources. Finally, wild and scenic designation must make sense for the river in question: it must be an appropriate and efficient river conservation tool.

Musconetcong Study Background

The impetus for the Musconetcong National Wild and Scenic Rivers study can be traced back to 1991 when petitions were circulated calling for the protection of the Musconetcong River under both the National Wild and Scenic Rivers System and New Jersey Wild and Scenic Rivers program. Meanwhile, Congress passed legislation in 1992 authorizing the National Park Service to study the eligibility and potential suitability of the Lower Delaware River for addition to the National Wild and Scenic Rivers System. Although the Musconetcong is a major tributary to the Lower Delaware

River, the legislation included only three Delaware River tributaries, all located in Pennsylvania.

The Musconetcong Watershed Association (MWA) was formed in 1992 and began water monitoring and river cleanup programs along the Musconetcong River. The MWA and the National Park Service (NPS) organized two Roundtable Meetings in 1993 as part of the NPS Rivers, Trails and Conservation Assistance Program. Representatives from local, county, and state governments, nonprofit organizations, businesses, and individuals came together to discuss the problems, amenities and opportunities associated with the Musconetcong River. The proceedings of the Roundtable meetings were used by MWA to produce a report entitled "THE MUSCONETCONG WATERSHED: A Conservation Strategy Handbook." The "Handbook" was used to educate watershed residents about river-related issues and resources.

In 1995, the New Jersey Department of Environmental Protection (NJDEP) Office of Natural Lands Management recommended to the NPS that the Musconetcong River be included in the Nationwide Rivers Inventory of "candidate" rivers that are considered to have the appropriate characteristics for wild and scenic designation. Two years later, 18 of the 19 municipalities along the river voted to request the NPS to study the Musconetcong River to determine its eligibility and suitability for inclusion in the National System. An initial meeting was held in July 1997 and included representatives from eighteen river corridor municipal governments, National Park Service, Musconetcong Watershed Association, county and state officials, major industries, Heritage Conservancy, Highlands Coalition, and Trout Unlimited, as well as interested citizens and river front property owners.

Study Approach

A Musconetcong Advisory Committee, consisting of municipal representatives was formed to work with the NPS and the Musconetcong Watershed Association and a work plan for completing the Wild & Scenic study was developed. It was agreed by all parties that the Musconetcong Advisory Committee and local municipalities would have the final say as to whether the Musconetcong River is recommended for designation. Subcommittees were formed to address public involvement needs and to conduct the resource assessment for the *Resource Assessment, Eligibility & Classification Report*. The study area included the main stem of the river and the river corridor from the outlet at Lake Musconetcong to the Delaware River, a distance of approximately 42 miles.

The *Eligibility & Classification Report*, completed in August 1999, recommended that three segments of the river were eligible for inclusion in the National Wild and Scenic Rivers System.

The committee then conducted an analysis of existing resource protection in the river corridor and developed draft management goals, objectives and key actions. The advisory committee served as the coordinating body for the study, guiding all major study activities. In order to facilitate the compilation of information about the river's resources and suitability, the NPS established cooperative agreements with the Musconetcong Watershed

Association and with Heritage Conservancy. These agreements allowed staff to provide outreach coordination, conduct resource and land use analysis, develop a GIS map system, and develop draft reports.

Study Goals

Based on local and state interest in a wild and scenic rivers study, the NPS had two major goals for the study:

- 1) To determine whether the Musconetcong River would be an appropriate addition to the National Wild and Scenic Rivers System, and conversely whether wild and scenic designation would be an appropriate tool for the river; and
- 2) To assist local communities in preparing and implementing a river management plan that would protect the river's special qualities, regardless of whether wild and scenic designation proved to be the recommended outcome of the study.

In accordance with the wishes of the study area communities and established NPS policy for wild and scenic studies of rivers that flow through primarily privately held lands, the study included the following elements:

- 1) A strong emphasis on grassroots involvement and consensus building in determining whether the river was suitable for designation and how it should be managed.
- 2) The development of a "comprehensive river management plan" during the study rather than after designation. The plan relied on private, local and state conservation measures rather than federal land acquisition and management to protect the river's outstanding resources and was the product of close collaboration between NPS, the advisory committee, and local and state governments.
- 3) A commitment to the study area communities that federal designation of the study segments would be recommended only if strong support was expressed through passage of resolutions by the affected municipalities.

Public Involvement

The advisory committee and the public outreach subcommittee initiated public meetings and events. Opportunities for public involvement included the following:

- Monthly advisory committee meetings at various locations throughout the river corridor open to all.
- Development and maintenance of a mailing list including local officials, county and state agencies, meeting attendees, and other interested individuals. Those on the mailing list received meeting notices, meeting minutes and handouts, and report drafts.
- A public opinion survey was developed and mailed to 750 residents of the 18 river municipalities, including 300 riparian landowners.
- Several special meetings were sponsored to promote public awareness of the river and of its unique resources, including a historical perspective on

the river valley presented by a NPS historian, driving tours of the watershed, canoe tours, and hiking trips to remote reaches of the river.

- Advisory committee members presented periodic progress reports to municipal officials and boards. A copy of the *Resource Assessment and Eligibility & Classification Report* was provided to each municipality.

Four copies of the draft River Management Plan were provided to each of the river municipalities and to others on the mailing list. A series of three public workshops were held between January and February 2002 to present the management plan and address any questions. A revised draft was prepared and mailed to each municipality in June 2002 with a request for a resolution in support of the plan and the designation of the river. Thirteen of the fourteen municipalities approved a resolution of support at a public meeting.

New Jersey Watershed Planning Process

The NJDEP Division of Watershed Management was created in 1999 to implement the state's watershed management program. NJDEP has delineated 20 major Watershed Management Areas (WMAs) in New Jersey. The WMAs are organized under the umbrella of five regional bureaus within the Division of Watershed Management.

The Musconetcong River falls within the Upper Delaware Region of New Jersey, which is designated as Watershed Management Area # 1, or WMA1. The region encompasses all of the Delaware River tributary watersheds in New Jersey from the Musconetcong north to the New York border. Other major tributary watersheds within WMA1 include the Pohatcong Creek, Pequest River, Paulinskill River and Flatbrook River.

The NJDEP Office of Environmental Planning presented information about New Jersey's *Statewide Watershed Management Framework* to the Musconetcong Advisory Committee at a meeting held in January 1998. NJDEP staff described plans to begin a Musconetcong River Watershed Characterization and Assessment Study, the first step in the development of a watershed management plan.

The Musconetcong Advisory Committee determined that while there are similar goals for both the National Wild and Scenic Rivers study and watershed management planning efforts, the latter involves a more detailed look at water quality issues and includes an assessment of Musconetcong River tributary lakes and streams. The National Wild and Scenic Rivers study contains more detail on river-related cultural, historic and recreational resources and focuses primarily on the Musconetcong River corridor. Moreover, the National Wild and Scenic Rivers study came about as a result of broad-based local support, whereas the NJDEP watershed management program is driven by Federal Clean Water Act mandates.

The Musconetcong Advisory Committee voted to support a watershed management planning initiative for the Musconetcong watershed with the understanding that such an effort will help sustain and support Musconetcong National Rivers program goals of long-term protection of the Musconetcong River and its tributaries. To avoid duplication of effort, the

Musconetcong Advisory Committee received assurances from the NJDEP Office of Environmental Planning staff that information gathered for the Musconetcong National Rivers study would be incorporated into NJDEP's Musconetcong Watershed Characterization and Assessment study.

In April 1998, the NJDEP Office of Environmental Planning began a three-year watershed management planning initiative for the Musconetcong River watershed with various stakeholder groups. The Musconetcong Watershed Management Initiative was halted in 2000 due to a lack of financial and technical resources, and because the NJDEP expanded the watershed planning process beyond the Musconetcong watershed to include all the watersheds within the Upper Delaware Region (WMA1). However, this initial watershed planning process resulted in the creation of a "Musconetcong Work Plan" that lists actions to be taken to improve water quality and address issues of concern. Many elements of the "Musconetcong Work Plan" are found in the Musconetcong Wild and Scenic Rivers Management Plan.

On October 2, 2000, NJDEP contracted with North Jersey Resource Conservation and Development Council to begin the watershed planning process within Watershed Management Area #1. The State has committed \$600,000 over four years to develop a comprehensive management plan for the entire Upper Delaware Region, including the Musconetcong River watershed.

II. Eligibility and Classification

This chapter documents the National Park Service findings relative to the eligibility of the study river segments for designation and the proposed classification under which the eligible segments could be included in the National Wild and Scenic Rivers System.

Eligibility and Classification Methodology

The National Wild and Scenic Rivers Act requires that for river segments to be eligible for inclusion into the national system they be free-flowing and adjacent to or within related land areas that possess one or more outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.

Free-flowing Condition

The National Wild and Scenic Rivers Act is intended to protect only “free-flowing” rivers, and such flows must be adequate to support all flow-dependent outstanding resource values. Section 16(b) of the Act defines “free-flowing” as:

“... existing or flowing in natural condition without impoundment, diversions, straightening, rip rapping or other modification of the waterway. The existence, however, of low dams, diversion works, and other minor structures ... shall not automatically bar ... consideration for ... inclusion: Provided, that this shall not be construed to authorize, intend or encourage future construction of such structures within components of the National Wild and Scenic Rivers System.”

Federal guidelines provide the following additional clarification:

“The fact that a river segment may flow between large impoundments will not necessarily preclude its designation. Such segments may qualify if conditions within the segment ... Existing dams, diversion works, riprap and other minor structures, will not bar recreational classification provided that the waterway remains generally natural and riverine in its appearance.”

There are eleven dams of varying size along the main stem Musconetcong River from Lake Hopatcong to Finesville, thus the “free-flowing” aspect of the study received considerable attention. The Musconetcong Advisory Committee used “natural riverine character” as the subjective standard to determine whether a particular dam significantly alters the river’s natural width, flow, and benthic characteristics, and to decide if a particular river segment met the eligibility requirement.

Dams such as those found at Imlaydale and New Hampton are little more than archaeological remains and have no effect on flow. The dams at Penwell, Asbury and Bloomsbury are historic mill dams that have created small pools, but exert minimal influence over the river’s natural riverine character.

Five dams along the river between Lake Hopatcong and Saxton Falls have created large impoundments that significantly alter natural riverine character excluding this segment of the river from National Wild and Scenic Rivers

eligibility. Lubbers Run, the largest tributary to the Musconetcong River, was also excluded due to the presence of several impoundments. In the Musconetcong Gorge below Bloomsbury a large dam diverts much of the river's flow into a canal that serves as a water supply and power source for the paper mill in Warren Glen. A second dam below Rt 519 and the paper mill also forms a substantial dam pool. This segment of the river was excluded from eligibility because the two dams and the canal diversion have significantly altered riverine character.

Outstandingly Remarkable Resource Values

To be considered eligible for inclusion in the National Wild and Scenic Rivers System, a river segment, together with its adjacent lands, must support one or more "outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values ..." (Section 1(a) of the Act). The Interagency Guidelines have further clarified that "other similar values, such as ecological, if outstandingly remarkable, can justify inclusion of a river in the national system."

In order to be assessed as outstandingly remarkable, a river-related value must be a unique, rare or exemplary feature that is significant at a regional or national scale. Also, all values should be directly river-related. That is, they should: 1) be located in the river or within one-quarter mile; 2) contribute substantially to the functioning of the river ecosystem; and/or 3) owe their location or existence to the presence of the river. The determination for evaluating outstandingly remarkable resources is, however, left to the judgment of the study team. For the purposes of the Musconetcong Study, river-related resources were determined to be outstandingly remarkable if they were found to be rare or exemplary within a regional or national context. The criteria applied for this context are as follows:

- National:** The resource's significance has been established through designation or recognition in federal programs such as endangered, threatened and/or rare species; and historical and cultural sites and parks.
- State:** The resource has been designated or recognized by the State of New Jersey in programs such as historic sites, recreational parks and trails, endangered, threatened and rare species, critical habitats, state planning areas, and stream classifications.
- Regional:** Regional significance has been recognized and documented in research programs or studies and confirmed by regional experts.

Classifications

Section 2(b) of the Act requires that eligible segments be classified as wild, scenic or recreational. For classification purposes, a study river may be segmented. Below is a brief description of each classification:

- Wild Rivers:** Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic Rivers: Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational Rivers: Those rivers or section of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Eligibility and Classification Findings

Eligible Segments and Proposed Classifications

An assessment of natural, cultural and historic features completed as part of this study shows that three segments of the Musconetcong River, a total of 28.5 miles, are eligible for inclusion in the National Wild and Scenic Rivers System. The following is a description of the river segments and proposed classifications, and a summary of outstandingly remarkable values.

Each of the three segments of the Musconetcong River is classified as recreational because the segment is readily accessible by road and/or contains some development along the shoreline. Segment A is also classified as scenic because most of the land along the riverfront is public parkland and remains largely primitive.

Segment A: Saxton Falls to the Rt. 46 Bridge (3.5 miles)
Classification: Scenic

Segment B: Kings Highway Bridge to the Railroad tunnels at Musconetcong Gorge (20.7 miles)
Classification: Recreational

Segment C: Hughesville Mill to Delaware River confluence (4.3 miles)
Classification: Recreational



Iron truss bridge, Borough of Bloomsbury

Outstandingly Remarkable Values

Recreational

The Musconetcong River Valley features a diversity of recreational opportunities that are popular enough to attract visitors from throughout the region. The river corridor provides a high-quality environment for a wide variety of recreational activities which are important to the local economy. State, county and local parklands within the river corridor provide significant opportunities for hiking, fishing, canoeing, camping, nature study and other outdoor activities. The Musconetcong River and its tributaries are regionally important trout fishing streams. Approximately 20 of the tributary streams support naturally reproducing trout populations. The river is also eligible for designation to the State Trails System as a *Waterways Trail*. The river-related recreational resources are considered to be regionally exemplary.

Historic and Prehistoric

The Musconetcong River Valley contains many river-related historic bridges, mills and historic districts that are listed on the National Register of Historic Places. One river-related resource, the Morris Canal Historic District, is a National Historic Landmark and was judged to be nationally exemplary. The Plenge Paleo-Indian archaeological site within the river corridor is eligible for National Landmark designation study. River-related historic resources were judged overall to be regionally exemplary.



Asbury Mill

Scenic

Several locations in the river corridor offer outstanding views of the agricultural river valley, Highland Ridges, Kittatinny Mountain and Delaware Water Gap. These views of landforms and vegetation throughout the seasons are only minimally interrupted by cultural intrusions. River-related scenery was judged to be regionally exemplary.

Wildlife and Critical Habitat

Regionally important populations of wildlife and critical habitat for state listed threatened, endangered or rare species are present within the river corridor. The Musconetcong River watershed lies entirely within the New Jersey Highlands Region, a landscape of national importance as determined by the U.S. Forest Service and within the Atlantic Flyway, one of four major migratory bird routes in North America.

Segment-by-Segment Analysis

The following is a categorical description of outstanding resources found within each study segment.

Segment A: Saxton Falls to Rt. 46 Bridge

- Recreational:** Allamuchy/Stephens State Park
Eligible State Waterway Trail
- Historic:** Morris Canal National Historic Landmark
- Scenic:** Largely primitive, undeveloped river corridor through state and municipal parklands
- Wildlife:** Barred Owl: State threatened
Brook Floater: Critically imperiled in NJ

Segment B: Kings Highway Bridge to the railroad tunnels at Musconetcong Gorge

- Recreational:** Musconetcong River Reservation
Eligible State Waterway Trail
Numerous state-owned access points for fishing, boating and hiking
- Historic:** Beattystown Historic District: National Register
Miller Farmstead and stone bridge: National Register
New Hampton Pony Pratt Truss Bridge: National Register
New Hampton Historic District: National Register
Imlaydale Historic District: National Register
Asbury Village Historic District: National Register
North Bloomsbury Historic District: National Register
- Scenic:** Outstanding views of agricultural river valley, Highland Ridges, Kittatinny Mountain and Delaware Water Gap
Outstanding views of agricultural river valley from Highway 639, Franklin Township
- Wildlife:** Wood Turtle: State threatened
Fleshy Hawthorn: State endangered

Segment C: Hughesville Mill to Delaware River confluence

- Recreational:** State-owned and county parks access points for fishing, boating and hiking
- Historic:** Siegle Homestead: National Register
George Hunt House: National Register
Riegelsville Company Town Historic District: National Register
- Critical Habitat:** Alpha Grasslands Natural Heritage Priority Site

III. River Management Framework

To ensure implementation of the River Management Plan, the creation of a management committee is recommended. An underlying principle in this recommendation is that existing institutions and authorities will continue to provide the foundation for the long-term protection of the Musconetcong River and its watershed. This committee will work with the Musconetcong Watershed Association and will build on the work of the Musconetcong Advisory Committee in highlighting river management issues.

The purpose of the Musconetcong River Management Committee is to promote the long-term protection of the Musconetcong River by: (1) bringing those involved in river issues together on a regular and ongoing basis, (2) stimulating cooperation and coordination among those organizations and individuals, (3) providing a forum for all river interests to discuss and resolve issues, and (4) coordinating implementation of this management plan.

The Musconetcong River Management Committee will serve in an advisory capacity to local, county, and state authorities and private interests to achieve effective protection of the river through implementation of the management plan recommendations.

Committee Membership

The committee membership will include municipal representatives of the watershed municipalities, representatives from each of the four counties, the New Jersey Department of Environmental Protection Division of Watershed Management, Division of Fish and Wildlife, Division of Parks and Forestry, the Musconetcong Watershed Association, and other non-governmental organizations. The committee may also establish sub-committees to address specific goals, objectives and key actions in the management plan.

Management committee member roles and responsibilities will be defined by a Memorandum of Understanding. This agreement will establish a cooperative commitment among members to participate in the long-term management of the river and to implement those parts of the management plan under their jurisdiction or for which they assume responsibility. Participation in this agreement will be contingent upon the endorsement by the committee's members of the provisions contained in the legislation designating the river.

Funding and Staff

To implement the actions identified in the management plan, the committee will require both direct funding and in-kind assistance. Funds may be directed to hire staff to coordinate the committee activities, undertake specific implementation projects and to cover general operating expenses related to specific activities or responsibilities.

If the Musconetcong River is included in the National Wild and Scenic Rivers System, the NPS will be authorized to enter into a formal agreement with the committee or its member organizations pursuant to Section 10(e) and or

Section 11(b)(1) of the National Wild and Scenic Rivers Act. Such agreements could include provisions for limited financial or other assistance from the federal government to facilitate the protection and management of the river. Such funds may be part of the annual budget request to Congress by the National Park Service. If adequate funding is forthcoming the NPS could provide support or transfer money directly to the committee through a formal cooperative agreement. An annual budget of \$400,000 would provide for NPS staffing, cooperative agreements, and municipal support.

For long-term funding needs and for specific implementation projects, the committee will also pursue financial assistance and in-kind contributions from individuals, foundations, corporations, and local, state and federal government sources.

National Park Service Role

The National Park Service serves as the key federal representative in the implementation of the Musconetcong National Wild and Scenic Rivers Management Plan. It is important to note, however, that the NPS' role in managing the river is limited. A key principle of the administrative framework is that existing institutions and authorities will play primary roles in the long-term protection of the river. Landowners, municipalities, counties, state agencies and private organizations will participate in maintaining the outstandingly remarkable qualities that made the Musconetcong River eligible for designation. This partnership approach to the management of the Musconetcong River entails no land acquisition or ownership by the NPS. Local landowners and municipalities will be responsible for managing land areas along the river corridor within the federally designated boundary.

The agency's principal role is to review federal projects as required by Section 7 of the National Wild and Scenic Rivers Act. NPS will evaluate any proposed water resources project directly affecting a designated river which requires federal assistance through permits, licensing, funding or other action. Through this partnership approach, the federal government would retain responsibility for ensuring federal water resource projects do not impair the river's free-flowing character or outstanding resources, while the municipalities and the state would retain their existing land use authority and responsibility for recreational management.

Guidelines For Water Resource Projects, Including Public Utilities, Transportation and Recreation Facilities

Facilities providing transportation, energy resources, communications, water supply, waste disposal, education and recreation are critical public services provided to citizens living, working in, and visiting the Musconetcong River corridor. If such facilities, however, are improperly located, designed, constructed or maintained, they may have the potential to severely damage or destroy the very values for which the river was considered for designation into the national system. The cumulative impacts of multiple corridor and stream crossings can exacerbate these problems.

Section 7 Provisions

For these reasons, the United States Congress (through Section 7 of the Federal Wild and Scenic Rivers Act (P.L. 90-542, as amended), directed that within the boundaries of designated national wild and scenic rivers that the proposed location, design and construction of water resource projects, where any kind of federal assistance is provided, should be reviewed to determine if there is the potential to affect the free-flowing character of wild, scenic or recreational rivers. Commonly used Section 7 terms are defined as:

- **Water Resources Project** – Any dam, water conduit, reservoir, powerhouse, transmission line, or other project under the Federal Power Act (FPA), or other construction or developments which would affect the free-flowing characteristics of a wild and scenic or a congressionally authorized study river. In addition to projects authorized by the Federal Energy Regulatory Commission (FERC), water resources projects may also include: dams; water diversion projects; fisheries habitat and watershed restoration or enhancement projects; bridges and other roadway construction; bank stabilization projects; channelization projects; levee construction; recreation facilities such as boat ramps and fishing piers; and activities that require a permit from the Army Corps of Engineers (ACOE), pursuant to the Rivers and Harbors Act or Section 404 of the Clean Water Act.
- **Federal Assistance** – Any assistance by an authorizing agency before, during, or after construction. Such assistance may include, but is not limited to: a license, permit, preliminary permit, or other authorization granted by FERC; a license, permit or other authorization granted by the Army Corps of Engineers. Assistance also includes federal funding of projects such as highways, roads and bridges; environmental and recreational facilities, community development activities; etc.
- **Free-Flowing** – Defined in the Wild and Scenic Rivers Act in Section 16(b) as “existing or flowing in natural condition without impoundment, diversion, straightening, rip-rapping, or other modification of the waterway.”

Procedures

The vast majority of these activities are subject also to review and approval by other federal, state and local agencies. No new permits are required under Section 7, however, the section requires that the federal agency assisting with the project consult with the National Park Service before a project is actually begun. Project proponents are encouraged to consult very early in the scoping, siting and project design process to avoid delays and costs associated with projects that cannot be approved under Section 7.

Section 7 states, in part, that no department or agency of the United States shall assist by loan, grant, license or otherwise, in the construction of any water resource project that either:

- Would have a direct and adverse impact on the values for which the river was designated (for projects located on a designated river); in the case of the Musconetcong River, this includes hydro-geology, water quality and quantity, certain botanical, fish and wildlife resources, and historic and cultural values; or

- Invade the area or unreasonably diminish the scenic, recreational, fish and wildlife values present in the area at the time of designation (for projects above or below designated rivers, or on a non-designated tributary).

It is the intent of this section to provide the National Park Service, the Musconetcong River Management Committee, landowners and public service providers with better guidance on how to plan, review and provide such needed facilities in the future. The National Park Service should conduct its Section 7 reviews in consultation with affected federal, state and local agencies, as well as the Musconetcong River Management Committee, and other appropriate citizens and organizations.

Review Criteria

Transportation, recreation and utility corridors and facilities, and other water resource projects, should be designed to protect the free-flowing character and outstandingly remarkable values of the Musconetcong River through application of the following:

I. Assessment of:

- A. Impacts on the free-flowing character of the Musconetcong River
- B. Impacts on the outstandingly remarkable values of the Musconetcong River for which the area was designated as a component of the National Wild and Scenic Rivers System.
- C. Effect on related environmental factors and ecological systems involved, including adjacent lands, waters, aesthetics, fisheries, recreational, floodplain, wildlife, vegetation, and historic and archeological values.
- D. Cumulative Impacts.
- E. Alternatives available to the applicant, with explanations as to why some alternatives are unsuitable.
- F. Secondary effects likely to be caused or encouraged by the project.
- G. Economic factors, including the need for resource protection measures in the approximate area in the future.
- H. Other relevant factors.

II. In addition to the general assessments described above, the following specific items need to be considered:

A. For all projects:

1. The facility should be located to take advantage of existing topography and vegetation.
2. The facility should be located, constructed and maintained so that it does not lead to accelerated bank erosion or degradation of streams and related resources.
3. Removal of trees, shrubs, and other vegetation should be kept to a minimum, for the protection of water quality, fish and wildlife habitat, visual quality and related values.
4. Construction should incorporate the use of materials that blend with the natural setting.

5. Only minimal filling of wetlands and floodplains should occur.
6. During construction, strict erosion control measures should be taken to prevent sediment from reaching the river. Only minimal clearing of existing vegetation, clearing, grubbing and grading should be performed.
7. The construction area should be restored to as natural a condition as possible immediately following construction.
8. Following construction, special measure may be needed to restore the natural appearance of the area, stabilize river banks, discourage damaging off-road vehicle or other recreational use, or enhance fish and wildlife habitat.
9. Materials used for bank stabilization following construction should maintain and enhance the natural and aesthetic qualities of the Wild and Scenic River area.
10. Biodegradable materials such as burlap, jute netting or blankets made from coconut fiber should be used to hold vegetative plantings in conjunction with slope stabilization and other erosion and sedimentation control measures.
11. Specifications regarding stabilization efforts and revegetation should be consistent with the goals of maintaining stream width as near as possible to the original width, and to provide early revegetation of the area.
12. If revegetation is required within the riparian forest buffer, native plant materials commonly found in that area should be used.
13. The time and method of planting native vegetation should occur in a manner that ensures maximum survival and growth of plant species.
14. Work should be performed at the time of the year when the stream is experiencing low flow conditions in order to minimize impacts to fish and macroinvertebrate species.

B. For corridors and rights-of-way:

1. Planning for new rights-of-way should identify existing nearby rights-of-way which the proposed facility might share or be located adjacent to.
2. Establishment of new corridors should anticipate future needs in that area, and attempt to accommodate those needs, so that additional, future intrusions into designated areas will be minimized.
3. The narrowest width right-of-way necessary to facilitate construction and maintenance of the facility should be used.
4. The low points of approach on the corridor should be far enough landward of the water's edge to direct runoff to a vegetated area away from any part of the river.
5. Upon reaching the riparian forest buffer during clearing operations for overhead transmission or communication lines, tall-growing tree species may selectively be removed. Shrubs, low growing tree species with a mature height of less than 20 feet, and other vegetation should be left as natural as possible.

6. Management of trees, shrubs and other vegetation for maintenance of all rights-of-way should be done manually in the riparian forest buffer. However, appropriate herbicides may be applied by hand to stumps of selectively cut trees, where establishing and maintaining a low-growing shrub community in this zone will further the objectives of the wild and scenic river designation. Selective hand application of certain pesticides to control insect or disease infestations is acceptable.

C. *River Crossings*

1. Bridge and culvert structures – In order to safeguard the free-flowing character of designated rivers and protect scenic, recreational and fish and wildlife values, bridges should be:
 - Clear-span structures (spanning the entire width of the waterway, without piers, piles, abutments or other structures located below the ordinary high water mark).
 - Low profile, and constructed of materials that blend with the natural surroundings as much as feasible.
 - Where watercraft and/or passage of anglers is required, a vertical clearance of 5 feet between the ordinary high watermark and the bottom of the bridge is desired.
 - Culverts should provide for a natural streambed under the span, either by using a bottomless structure or by recessing the culvert bottom a minimum of 12 inches below the river bottom.
2. The river should be crossed by a method that minimizes disruption to the streambed. Rivers should be crossed by bridges perpendicular to their banks, and at the point and time that are least damaging to fisheries and vegetation.
3. If aerial crossings are used, they should be designed to accommodate safe recreational use of the river in addition to protection of the river banks.
4. A single-span river crossing is preferred wherever possible, maintaining proper vertical clearance over the waterway and proper structure height for minimal adverse visual impact.
5. Underground installation is preferred for all new utility lines except: power lines of greater than 35 KV; where new lines are to be placed on existing poles, towers or bridges; or where burying is proven to be infeasible because of geologic constraints.
6. Directional boring will be the preferred method of crossing the river. Open cut construction across the stream is discouraged, except for large diameter installations such as a sewer or water main.
7. Towers and poles should be removed when elimination of existing above-ground facilities occurs.
8. The width of the riverbed should not be altered.

D. *Other Structures*

Except as provided for in B and C above, structures associated with water resource projects should be located in such a manner as to protect and enhance the outstandingly remarkable values of the Musconetcong River.

IV. Resource Management

The Musconetcong Advisory Committee identified five major categories of resources that require management in order to protect the river corridor:

- Recreational and Scenic Resources
- Historic and Archaeological Resources
- Farmland and Open Space
- Natural Resources
- Water Quality

The following section describes each of these major resource categories, the responsibilities of government agencies and other entities involved in their management, the goals and objectives for each and key actions to implement the plan as determined by the advisory committee.

Recreational and Scenic Resources

The Musconetcong River Valley features a remarkable diversity of scenic farms, secluded natural areas, villages and hamlets. In addition to being one of the most scenic river valleys in New Jersey and the surrounding region, the Musconetcong valley is a high-quality setting for a wide variety of recreational activities such as hiking, hunting, fishing, canoeing, camping, nature study and other outdoor activities. Local residents as well as people from the surrounding region come to the Musconetcong River Valley to enjoy the recreational opportunities. The scenic and recreational resources combined are an important part of the local and regional economy.

The geologic features of the Musconetcong River Valley play a major role in determining its regionally unique scenic character. The prominent ridges that parallel both sides of the valley provide an unmistakable definition to the valley landscape. Long stretches of the river valley are wide and straight enough to allow for sweeping views of gently sloping farmland and forested ridgelines. The river itself contains many hidden away areas that provide intimate views of mature forests, farmland and historic villages. Scenic views can be divided into two categories: intimate views of the river and its surroundings, and vistas of the river valley from higher elevations.

Recreational opportunities in the Musconetcong River Valley are found in the over 5,000 acres of state-owned parks and river access points. There are also several hundred acres of county and local municipal parklands along the river. In addition, several property owners lease their riverfront lands to private fishing and hunting clubs and many riverfront landowners permit public access for fishing.

The Musconetcong is one of the most popular trout fishing streams in New Jersey and the surrounding region, and has more miles of stocked waters than any other stream statewide. The Musconetcong River's popularity is growing with the increase of public fishing access sites maintained by the NJDEP Division of Fish and Wildlife.

The river is also an important source of recreation for boating (primarily canoes and kayaks), and has been identified by the NJDEP Office of Natural Lands Management in its New Jersey Trails Plan as a Waterways Trail. The



Recreational paddling on the Musconetcong River.

most frequently canoed sections of the river are between Beattystown and Bloomsbury. The river below Bloomsbury requires difficult portages at the Warren Glen dams. The Musconetcong Watershed Association recently produced a waterways trail guide to provide additional access information to river users. The increase in number of fishing access sites has also created more access to the river for boaters.

Swimming and tubing are common recreational pursuits at various

points along the river. The Musconetcong River corridor also provides numerous locations for hiking, birding and other passive forms of recreation. Hiking opportunities along the Musconetcong are found in Allamuchy-Stephens State Park, Point Mountain Park, Musconetcong Preserve and state-owned lands below Bloomsbury.

Conflicts between riverfront property owners and recreational users of the river (primarily fishermen) are known to occur in certain areas. As the amount of public lands along the river and numbers of recreational users increase over time, the potential for such conflicts will likely increase. The Green Acres Program, as land acquisition agent for the Department of Environmental Protection, continues to maintain an aggressive program along the river, and these properties are turned over to New Jersey Division of Fish and Wildlife. The Division maintains these areas to provide access to the river, primarily in the form of parking for anglers. The Division encourages easements, which provide perpendicular and parallel access to the river's edge. There is currently no comprehensive management plan in place to protect the natural resources while providing recreational opportunities. A management plan is needed to ensure that recreational use is sustainable from a resource standpoint, and that recreational opportunities are facilitated in a way that protects both property owners and recreational users of the river. Informing both river recreationists and landowners about the available public access points and appropriate uses of public lands would serve to minimize conflicts and improve the condition of the resources.

There are also three on-going regional trail development projects within various parts of the Musconetcong watershed. The Highlands Trail currently crosses a tributary to the Musconetcong, Lubbers Run, in Byram Township and is proposed along the ridge of Musconetcong Mountain in other parts of the watershed. Other trail projects include the Liberty to Water



Scenic view of Musconetcong Valley from Point Mountain.

Gap Trail (from Liberty State Park on the Hudson to the Delaware Water Gap, a project initiated by the Morris County Park System), and the Morris Canal Corridor Trail (to follow the route of the Morris Canal along or near the Musconetcong River in Morris County, a project involving county, state, and federal agencies and five private groups). Such linear linkages are a priority for the state Green Acres program.

The 625 acres owned by Fish and Wildlife are scattered along the river, providing almost two dozen access points, mostly used by fishermen. The largest parcel is the 123-acre Musconetcong Wildlife Management Area (the Iraeni Tract) in Pohatcong, which borders the 164-acre Warren Glen Pohatcong Park. The Iraeni Tract is across the river from Hunterdon County's Musconetcong Gorge Nature Preserve. The Fish and Wildlife sites provide a good cross-section of the watershed's lands, from steep forested slopes to croplands. Fish and Wildlife also manages the 234-acre Hackettstown Hatchery.

The largest NJDEP Parks and Forestry holding is the huge complex in Byram, Green, Allamuchy, and Mount Olive townships at the northeastern end of the Musconetcong watershed, just below Lake Musconetcong. Within this complex are Stephens State Park (805 acres) and Allamuchy Mountain State Park (7,627 acres, of which 2,440 are a Natural Area, and Saxton Falls). Stephens State Park and Saxton Falls are along the river, with Allamuchy extending from the river to the watershed ridgeline, a huge extent of forested land. These parks are considered complete, although parks officials are seeking about 450 acres in and around Allamuchy Mountain State Park to consolidate its border and add an access point. These parks are very well used, with annual attendance figures in Stephens averaging 40,000-45,000 and in Allamuchy 62,000-67,000.

The Hunterdon County parks provide some of the Musconetcong Watershed's best natural and recreational sites. All four parks contain substantial forested tracts and ridgelines, and the two largest extend to the river's edge. Warren County manages part of the Morris Canal and Patriot's Path.

Morris County does not have holdings in the Musconetcong river corridor.

Parks, public recreation and protected open space in the plan area:

- Allamuchy – Stephens State Park
- Musconetcong River Reservation – Point Mountain Section
- Musconetcong River Reservation – Musconetcong Gorge
- Highlands Trail
- Liberty to Water Gap Trail
- Morris Canal Corridor Trail
- Patriot's Path
- Hampton Borough Park
- Hackettstown Municipal Park
- NJDEP Fish and Wildlife river access sites
- Musconetcong Wildlife Management Areas
- Bethlehem Township Heritage Park
- Charlestown Reserve
- Warren Glen Pohatcong Park
- Tower Hill Park

GOAL: Encourage recreational use that is compatible with the preservation of natural and cultural qualities of the river corridor while respecting private property.

OBJECTIVE 1.1 Protect and enhance the fisheries of the river and river tributaries.

Key Actions

- ⇒ Evaluate the river and its tributaries for evidence of trout production and recommend reclassification if appropriate.
- ⇒ Preserve and protect trout production streams, including headwater areas and tributaries.
- ⇒ Maintain and restore riparian buffers along the river and river tributaries to protect water quality and moderate temperature.
- ⇒ Design, construct and maintain habitat improvements to enhance trout habitat.
- ⇒ Identify non-functional dams for potential removal.

Roles

- > SG/NG
- > LG/SG/LO/NG
- > LG/SG/LO/NG
- > SG/NG/LO/LG/CG
- > SG/LO/NG

OBJECTIVE 1.2 Provide suitable and appropriate public access to the river corridor for recreational uses.

Key Actions

- ⇒ Provide signage and appropriate facilities for existing river access points.
- ⇒ Conduct an inventory and develop a recreational user's guide to the river to direct visitors to appropriate public use areas.
- ⇒ Evaluate the need and capacity for additional access points for designated uses as public recreation lands are expanded.

Roles

- > LG/SG/LO/NG
- > CG/SG/NG
- > LG/NG/SG/CG

Many agencies, organizations and individuals will have active roles in completing the key actions of this management plan. Recommended roles are abbreviated as follows: LO = landowner, LG = local government, CG = county government, SG = state government, and NG = non-governmental organization.

OBJECTIVE 1.3 Protect and enhance natural and cultural resources on public lands.

Key Actions

- ⇒ Develop and implement management plans for all public lands.
- ⇒ Provide property maintenance through inter-governmental cooperative agreements, dedicated funding and voluntary citizen action.
- ⇒ Mark property boundaries to clearly identify the extent of public lands in the river corridor.
- ⇒ Support appropriate patrol and law enforcement on public recreation lands.

Roles

- > LG/SG
- > LG/SG/NG/LO
- > LG/SG
- > LG/LO

OBJECTIVE 1.4 Identify and preserve lands in the river corridor and the watershed, which have exceptional scenic value.

Key Actions

- ⇒ Identify and delineate scenic corridors, vistas, landscapes and natural features and incorporate into municipal and county plans.
- ⇒ Preserve priority scenic corridors, vistas, landscapes and natural features through open space acquisition, purchase of development rights and donation of conservation easements.
- ⇒ Encourage development and redevelopment patterns, which maintain views and vistas by adopting appropriate zoning and land development ordinances and design guidelines.

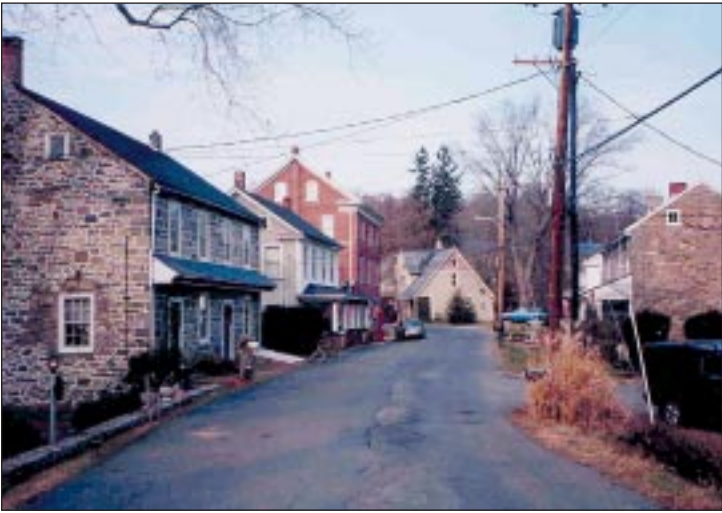
Roles

- > LG/CG/NG
- > LG/CG/SG/NG/LO
- > LG

Historic and Archeological Resources

Human habitation in the Musconetcong valley has been traced back to as early as 12,000 years ago when Paleo-Indians occupied the region during the final retreat of the Wisconsin glacier. Evidence of their presence in the valley was documented at the Plenge Site, which is located along the lower Musconetcong River in Warren County. The Plenge Site was the first of only two major Paleo-Indian archaeological site excavations in New Jersey, and it is considered to be one of the most important in the northeastern United States.

Outstanding river-related historic features – many of which are listed on the New Jersey and National Registers of Historic Places – can be found in Stanhope, Waterloo Village, Asbury, Finesville and several other Musconetcong River communities. These features contribute greatly to the scenic character and overall quality of life in the Musconetcong valley, and are important to the local economy as key components of regional tourism.



Historic Finesville

By the time European settlement came to the Musconetcong valley during the early 18th century, the Lenape Indians were already in a state of decline, and the several thousand-year-old aboriginal occupation was coming to an end. While the Lenape Indians burned off significant areas of forest to plant crops and attract game, their only lasting imprint on the landscape were the major trails that European colonists eventually adapted to roads. One of these was the Malayelick Path which ran from the head of the tidal Delaware River to the Musconetcong River “gap”

between Musconetcong and Schooleys Mountains. The path was the forerunner of State Highway 31, which begins in Trenton and crosses the Musconetcong River at Hampton Borough. Portions of State Highway 206 are part of the Minisink Trail, which linked the New Jersey coast with Minisink Island in the Upper Delaware River.

Subsistence agriculture took root in the lower Musconetcong valley at the beginning of the 18th century. The fertile limestone valley was rapidly cleared for croplands, and subsistence agriculture gradually evolved into commercial grain and dairy farming. Villages sprang up around the many gristmills and iron forges built along the Musconetcong River from Finesville to Hackettstown.



Railroad tunnel above the Musconetcong Gorge.

The charcoal iron industry was also established during the early 18th century on the lower Musconetcong River, and was supported by abundant supplies of ore from the surrounding ridges. The iron industry faced a precipitous decline when wood supplies were depleted by the early 19th century. However, the industry was rescued when one of early America’s truly amazing engineering feats – the Morris Canal – was built to carry coal from the Pennsylvania coalfields to fuel the iron furnaces.

The Morris Canal was a world-famous engineering marvel that required abundant supplies of water. Lake Hopatcong, which was originally a small natural glacial lake, was dammed to supply water to the entire canal system, but it was found to be an inadequate source. To augment the flow of water to the canal, several other dams were built on the Musconetcong River and Lubbers Run, its largest tributary.

Only a few remnants of the Morris Canal remain, yet its impact on the river can be seen in the silted-in dam pools above Waterloo Village and Saxton Falls. The lakes that were created to serve the needs of the canal and iron industry also spawned a new "industry" – summer cottage recreation and tourism. Even as the iron industry and Morris Canal were dying out, passenger trains and automobiles were carrying people to the summer cottages that sprang up along several lakes of the upper Musconetcong River watershed. This historic land-use pattern in the upper valley continues today, although most of the summer cottages have since become permanent residences. The lower Musconetcong River Valley, where agriculture continues to dominate the landscape, has undergone remarkably little change in the past 100 years.

Nearly all known archeological sites in the Musconetcong River Valley are located on level well-drained soils situated on lower-lying terraces above the floodplain. Prehistoric sites tend to cluster in wider areas of the valley floor near passes through ridge gaps. Particular site concentrations have been identified within a one-mile radius of Hackettstown, Beattystown, Hampton, Penwell, Asbury, West Portal and Riegelsville. Almost all are open sites containing remains of campsites and activity areas.

Remains of locks and associated historic archeological features have been found within the Morris Canal Historic District National Historic Landmark paralleling the river above Port Colden. The Paleo-Indian Plenge Site near Asbury is the only other archeological locale presently considered eligible for National Historic Landmark designation study.

Unlike most areas in the region, a large portion of the Musconetcong River Valley remains a relatively undeveloped rural enclave. Although road construction and other developments have destroyed four known prehistoric sites and impacted all historic resources, inventoried archeological resources located within fields or forested areas may yet survive relatively intact. Un-inventoried archeological sites also almost certainly survive in designated historic sites and districts, areas of known site concentration, in level, well watered and drained locales particularly conducive to human habitation, in and around historic buildings and structures, and other locales.

Archaeological sites, historic sites and districts located in the plan area:

- Paleo-Indian site
- Morris Canal National Landmark
- Stanhope
- Waterloo Village
- Saxton Falls
- Beattystown
- Stephensburg
- Miller Farmstead and Stone Bridge
- Penwell
- Lebanon Township Historical Museum
- New Hampton Pony Pratt Truss Bridge
- Squires Point
- Changewater
- New Hampton
- Imlaydale
- Asbury
- Bloomsbury
- Warren Glen
- Siegle Homestead
- Finesville
- George Hunt House
- Rieglesville/Mt. Joy

GOAL: Preserve and protect the character of archaeological sites and historic structures, districts, sites, and landscapes in the river corridor.

OBJECTIVE 2.1 Protect historic bridges and other historic structures and landscapes.

Key Actions

- ⇒ Complete cultural resource inventories and incorporate into master plans and ordinances.
- ⇒ Rehabilitate rather than replace bridges that are on or eligible for the National Register of Historic Places or are integral to National Register Districts.
- ⇒ Encourage the establishment of historic preservation commissions and the adoption of historic preservation plan elements in master plans.
- ⇒ Complete nominations to the State and National Registers of Historic Places.
- ⇒ Recommend the designation of historic districts and outstanding historic resources as Historic and Cultural Sites through municipal master plans.
- ⇒ Develop model ordinances, design guidelines and case studies to support preservation.
- ⇒ Promote the use of federal tax credits, state and federal grant programs, and transportation enhancement funds for preservation and rehabilitation.

Roles

- LG/NG
- CG/SG
- LG/CG
- LG/NG/LO
- LG/NG
- LG/CG/NG
- LG/CG/SG/NG/LO

OBJECTIVE 2.2 Promote public awareness of historic and archaeological resources and their benefits to the community.

Key Actions

- ⇒ Encourage activities such as self-guided heritage tours, walking tours, oral history presentations and heritage-based events.
- ⇒ Evaluate cultural and heritage tourism potential of the river corridor and river communities.
- ⇒ Promote the economic benefits of preservation to the community.
- ⇒ Provide training and information on techniques for preserving historic structures, districts and landscapes.

Roles

- NG/CG
- NG/CG/LG
- NG/CG
- LG/CG/SG/NG

LO = landowner, LG = local government, CG = county government, SG = state government, and NG = non-governmental organization.

OBJECTIVE 2.3 Ensure consideration of historic and archaeological resources in land development process.

Key Actions

- ⇒ Encourage review of development and building permit applications for impacts to historic sites and districts, and archaeological sites.
- ⇒ Prepare guidelines for restoration of historic bridges.
- ⇒ Provide buffer zones for significant cultural resources.
- ⇒ Review zoning and land development ordinances to determine their effect on historic resources and encourage historic re-use.
- ⇒ Promote educational programming with river corridor school districts.
- ⇒ Encourage the establishment of a river corridor natural, historical and cultural interpretive center.

Roles

- > LG/SG
- > CG/SG
- > LG/LO
- > LG/NG
- > NG
- > NG

Townships with significant historic resources may incorporate protective strategies into their comprehensive planning and zoning in order to retain the unique character these resources lend to their towns.

Greenwich Township has included in its Master Plan extensive findings concerning historic sites and structures, including the results of comprehensive historic surveys and reviews, a map of historic landmarks, structures listed on state and national registers, and sites eligible for listing. The Master Plan discusses the benefits of historic preservation to the township and sets forth numerous methods at the township's disposal to achieve historic preservation. These include: 1) historic district overlay zoning, and ordinances that transfer density away from historic features; 2) establishment of a Historic Preservation Commission that would formalize review of development and building permit applications, and establishment of a Historic/Design Committee that would suggest architectural design guidelines, and that would provide input on applications for new construction; 3) site plan review; 4) restrictive covenants; 5) sale/leaseback programs; 6) nominations to state and national registers of historic places; 7) preservation easements to limit exterior alterations of buildings, to limit changes in use, and/or to provide agreement on the manner of future subdivision or development.

The "Historic Village" section of Greenwich's zoning ordinance provides the teeth to implement the master plan recommendations. Under this ordinance, a Committee on Architectural Review must grant a certificate of compliance with regard to exterior appearance, design, and relation to other historical buildings in the district before a zoning permit can be issued. Certificates of compliance are issued both for new structures within the designated historic village and those adjacent to historic structures outside of it. The Committee on Architectural Review also decides the appropriateness of removal or demolition of buildings constructed prior to 1900.

Farmland and Open Space Preservation

About 15 percent of the Musconetcong River watershed's 100,864 acres are permanently preserved as open space or farmland. Most of these 'green acres' border the river or are within the one-quarter mile corridor of the wild and scenic plan area.

The most active acquisition agencies have been the New Jersey Department of Environmental Protection Green Acres Program (about 10,660 acres), county and state farmland preservation programs (about 2,419 acres, 1,340 of this in Warren County), and the Hunterdon County Parks Program (about 1,150 acres).

Within the last several years, however, municipalities have become an increasingly active partner. As of December 2000, 12 of the 26 municipalities in the Musconetcong Watershed had enacted special taxes for open space acquisition. Eleven of those municipalities are within the National Wild and Scenic Rivers study area, bordering the river. In the watershed, there are 204 acres of municipally owned open space. Municipalities with open space plans and dedicated funding can apply to the state Green Acres Program for Planning Incentive Grants that average about \$500,000 and can be replenished as the money is spent.



Agricultural Valley

Three of the four counties along the river have their own open space or parks programs. In Warren and Morris counties, these programs are funded by a dedicated tax; in Hunterdon, they are funded through capital expenditures.

All four of the counties have farmland preservation programs, although Sussex County's program emphasizes areas outside the Musconetcong Watershed. State funds support the farmland preservation programs in Hunterdon, Warren and Morris, with the counties providing a 20 to 40

percent match on each easement purchase. Warren's 1,340 preserved acres are in 10 farms, all of them on or near the river. Hunterdon has 467 acres in seven farms in the watershed, with one 135-acre farm directly on the river. Morris has preserved five farms containing 612 acres, all immediately on the river. Warren is aggressively pursuing more farms next to or near the riverside clusters. All farms within the preservation program are required to have conservation plans to control erosion and runoff.

The active participation of municipalities and counties and of the Musconetcong Watershed Association and other citizens groups has helped make the Musconetcong corridor a high-ranking state preservation priority. The ultimate goal of the State Green Acres Program in the Musconetcong corridor is to establish a greenway along the entire length of the river. The most recent legislation signed in April 2001 allocated an additional

\$1 million for open space acquisition and planning incentives for the Musconetcong River Greenway. To date, the Green Acres ‘State Land Acquisition Program’ has obtained just over 10,000 acres within the Musconetcong watershed that have been deeded to the State Division of Parks and Forestry or the State Division of Fish and Wildlife. Of these, 625 acres are scattered along the river, providing almost two dozen access points, mostly used by fishermen. In addition, the Green Acres ‘Green Trust Program’ makes grants and loans to municipalities and counties and matching grants to non-profit preservation groups. Within the watershed are 131 green acres owned by non-profit groups, 10 of those on the river and 111 within a half-mile.

GOAL: Preserve farmland and open space within the river corridor and the watershed.

OBJECTIVE 3.1 Maintain the rural and agricultural character of the watershed.

Key Actions

- ⇒ Support the New Jersey Farmland Assessment Act, which provides preferential tax treatment for land in agricultural or horticultural use.
- ⇒ Encourage landowner enrollment in approved farmland preservation programs and agricultural districts to preserve agricultural cores.
- ⇒ Support adoption of Farmland Preservation Elements to municipal master plans.
- ⇒ Encourage the appointment of municipal Agricultural Advisory Committees.
- ⇒ Support the approval of dedicated municipal funding for farmland and open space preservation.
- ⇒ Review existing and proposed local ordinances and amendments, and adopt policies that support agricultural land use.
- ⇒ Encourage the use of conservation easements, purchase of development rights, and similar voluntary techniques for the preservation of farmland.
- ⇒ Develop community design guidelines that are compatible with the rural character of the valley and encourage implementation.
- ⇒ Support the State Plan area designations in the watershed of Rural Environmentally Sensitive Planning Area (PA4B) and Environmentally Sensitive Planning Area (PA5).

Roles

- > LG/SG/NG/LO
- > SG/LG/CG/NG/LO
- > LG
- > LG
- > LG/NG/LO
- > LG/NG
- > LG/NG/LO
- > LG/CG/NG/LO
- > LG/SG/NG/LO

LO = landowner, LG = local government, CG = county government, SG = state government, and NG = non-governmental organization.

OBJECTIVE 3.2 Increase recreation opportunities, enhance wildlife habitat, promote sustainable agriculture and protect water quality.

Key Actions

- ⇒ Identify and map existing protected public and private lands to target gaps for conservation.
- ⇒ Identify the Musconetcong river corridor as a high priority for open space preservation in open space plans.
- ⇒ Support the approval of dedicated municipal funding for farmland and open space preservation.
- ⇒ Review local ordinances and adopt policies that support smart growth strategies such as non-contiguous clustering, lot size averaging, center-based planning and open space zoning.
- ⇒ Encourage the use of conservation easements, purchase of development rights, and similar voluntary techniques for the preservation of farmland.
- ⇒ Ensure that funding for preservation of open space includes management of public lands and monitoring of conservation easements.

Roles

- > LG/CG/NG
- > LG/CG/SG/NG
- > LG/NG/LO
- > LG/NG
- > LG/CG/NG/LO
- > LG/SG/NG

Some communities with a strong agricultural base have taken action to preserve their farmland using state incentive programs, county programs, zoning tools, and land acquisition or preservation mechanisms. Pohatcong Township, Warren County has taken advantage of the state Farmland Preservation Planning Incentive Grant program by adopting a Farmland Preservation Plan. Necessary components of these plans are a comprehensive inventory of farm properties with a map of significant agricultural land areas, a statement showing that municipal ordinances support and promote agriculture in the township, and a plan for preserving as much farmland as possible in the short term by leveraging monies made available by the Garden State Preservation Trust Act. Under this program, the State Agriculture Development Committee (SADC) may fund up to 50 percent of the cost of the ten-year disbursement program.

Pohatcong has also been creative about raising revenue to acquire or otherwise preserve farmland. It has established an Open Space/Farmland Trust Fund through a tax increase of five-cents per one hundred dollars assessed property value in order to raise roughly \$100,000 per year to be earmarked for open space and farmland preservation. Pohatcong has also established an Agricultural advisory Committee to make recommendations for establishing agricultural development areas in the township.

What is sustainable agriculture?

Sustainable agriculture refers to an agricultural production and distribution system that:

- Achieves the integration of natural biological cycles and controls,
- Protects and renews soil fertility and the natural resource base,
- Optimizes the management and use of on-farm resources,
- Reduces the use of nonrenewable resources and purchased production inputs,
- Provides an adequate and dependable farm income,
- Promotes opportunity in family farming and farm communities, and
- Minimizes adverse impacts on health, safety, wildlife, water quality and the environment.

Source: Sustainable Agriculture Network, 2002

Natural Resources

The Musconetcong River is a tributary to the Delaware River and both rivers have features that are recognized as being of national importance. The Delaware River is one of four major bird migratory routes in North America and the Musconetcong is part of this important wildlife corridor. The Musconetcong River watershed is located entirely within the New Jersey Highlands region, part of the New England Uplands physiographic province.

Geology

High ridges of crystalline rock separated by limestone valleys distinguish the watershed. The rugged and discontinuous Highland ridges rise abruptly in contrast to the nearly flat Triassic Lowlands and Croton plateau of the Piedmont region. Due to the karst topography, some of the small streams that begin on the ridge tops flow down into the valley and disappear into underground cavern networks. In other areas, groundwater flows into the river through springs in the riverbed. The terminal moraine of the Wisconsin glacier crosses the valley below Netcong and Stanhope.

Vegetation and critical habitat

The Musconetcong watershed lies within the New Jersey Highlands, a region containing the greatest diversity of natural resources in the state. The forested ridges of the Highlands form critical migration routes for songbirds and hawks following the distinct topography of the New England Uplands physiographic province. The New Jersey Highlands was recognized in 1991 as an area of national significance when Congress authorized a study of the region by the U.S. Forest Service. The forested ridges that define the watershed boundaries of the Musconetcong River, including Musconetcong Mountain, Schooleys Mountain and Pohatcong Mountain, have been identified by the Forest Service study as critically important forestland.

Two Natural Heritage Priority Sites are located within the plan area: a portion of the Alpha Grasslands, located in Pohatcong Township, Warren County; and Vines Ravine, located in Holland Township, Hunterdon County. These sites are identified by the Office of Natural Lands Management, DEP Endangered and Nongame Species Program and The Nature Conservancy as containing critical habitat of rare species and exemplary natural communities.



Barred Owl

In addition, the Natural Heritage Program has records of the following rare species within the eligible river segments:

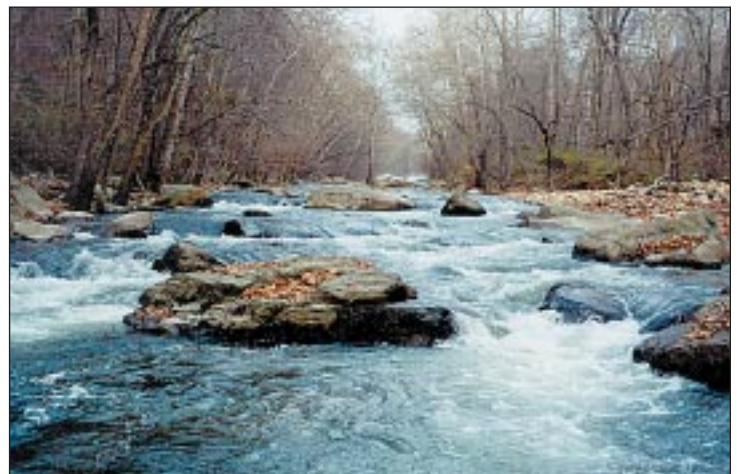
- | | | |
|-------------------|-----------------------------|----------------------------|
| • Barred owl | <i>Strix varia</i> | State threatened |
| • Brook floater | <i>Alasmidonta varicose</i> | Critically imperiled in NJ |
| • Wood turtle | <i>Clemmys insculpta</i> | State threatened |
| • Fleshy hawthorn | <i>Crataegus succulenta</i> | State endangered |

Fisheries

The Musconetcong River is one of the most important trout fisheries in New Jersey, and as result it is one of the state’s most valuable recreational resources. Trout, especially the native brook trout, are important indicators of water quality because of their sensitivity to pollution and changes in habitat.

The NJDEP Division of Fish and Wildlife stocks the Musconetcong River and two tributaries, Trout Brook and Lubbers Run, each year with brook, brown and rainbow trout. Approximately 20 Musconetcong tributary streams support natural breeding populations of brook or brown trout. These streams support populations that are extremely sensitive to thermal pollution, siltation and habitat degradation. Two Musconetcong tributaries, Hances Brook and Stephensburg Brook, receive the special designation of Wild Trout Stream and are managed under more restrictive angling regulations

The main stem Musconetcong River is classified by the NJDEP as Trout Maintenance Waters for its entire length. Eighteen Musconetcong tributary brooks are classified as Trout Production streams. These classifications are determined by NJDEP Division of Fish and Wildlife – Bureau of Freshwater Fisheries, and are contained in the State Surface Water Quality Standards. A Trout Maintenance designation means that the water body supports trout throughout the year, whereas Trout Production means that the water body is used by trout for spawning or nursery purposes during their first summer.



Musconetcong River

GOAL: Preserve, protect, restore and enhance the outstanding natural resources in the river corridor and the watershed, including rare and endangered species, forests, steep slopes, floodplains, headwaters and wetlands.

OBJECTIVE 4.1 Identify and prioritize important wildlife habitat and natural resources in the river corridor and along its tributaries.

Key Actions

- ⇒ Conduct natural resource inventories to identify important resources and critical areas.
- ⇒ Utilize existing resource inventories and plans to prioritize natural resource protection efforts.
- ⇒ Establish steep slope districts limiting disturbance activities in sensitive areas.
- ⇒ Encourage woodland protection on steep slopes, ridges and stream corridors.
- ⇒ Encourage conservation of floodplains to protect flood storage capacity and maintain the ecological function of the floodplain.
- ⇒ Encourage the use of conservation easements, purchase of development rights, and similar voluntary techniques for the preservation of critical natural features.
- ⇒ Maintain and disseminate GIS data to provide up-to-date information on the location and status of conservation lands.

Roles

- > SG/LG/CG/NG
- > SG/CG/LG/NG
- > LG
- > LG
- > LG/SG
- > LG//CG/NG/LO
- > CG/SG

OBJECTIVE 4.2 Sustain biodiversity and habitat linkages through private land stewardship and public land management.

Key Actions

- ⇒ Encourage the creation of an interconnected system of green spaces and wildlife corridors within the watershed.
- ⇒ Identify and implement habitat restoration projects in the watershed that will benefit wildlife.
- ⇒ Provide technical assistance to landowners seeking to protect, restore and enhance riparian buffers, wildlife habitat and natural resources.
- ⇒ Encourage reforestation to prevent erosion and enhance wildlife habitat.
- ⇒ Educate landowners about forest stewardship and management options that protect wildlife habitat.

Roles

- > SG/LG/NG/LO
- > SG/NG/LO
- > FG/SG/NG/LO
- > SG/NG/LO
- > SG/NG

LO = landowner, LG = local government, CG = county government, SG = state government, and NG = non-governmental organization.

Open space plans have been prepared and implemented by many of the river corridor communities as a means of preserving natural resources. In Bethlehem Township, Hunterdon County, open space preservation with a focus on protecting unique and natural features has been a high priority. The Bethlehem Township Greenway and Open Space Plan was prepared to set guidelines to preserve open space including farms, historical artifacts and environmentally sensitive areas. The plan includes an inventory of sensitive landscapes in a municipality replete with steep slopes, forests, headwaters, undiscovered historical sites and rich farm acreage, and establishes objectives for expanding parklands in accordance with county and state plans as well as local interests. Methods of preservation involve fee simple and easement acquisitions by government and non-governmental agencies as well as consideration in development applications as they arise. Natural resource protection ordinances are proposed as an additional measure of protection.

To date, state, county, municipal and non-governmental resources have been combined to preserve 1,283 acres of farmland and 1,645 acres of forest and field. An additional 531 acres are under consideration or negotiation for preservation either on a fee simple or deed restricted basis as of December 2001.

A municipality may protect its resources by limiting development on steep slopes. Lebanon Township, Hunterdon County has enacted a steep slope ordinance that prohibits development, regrading, or stripping of vegetation on slopes greater than 25 percent, and that limits these activities on slopes greater than 15 percent. Newly subdivided lots in Lebanon must include a minimum of one contiguous acre of land with a slope less than 15 percent on which all development shall occur.

Model ordinances recently developed for the Ten Towns Great Swamp Watershed Management Plan includes a steep slopes ordinance that recommends the following:

- Require mapping of steep slope areas in connection with site plans and subdivisions.
- Encourage roads and driveways to follow the natural terrain to the greatest extent possible.
- Prohibit development, re-grading, or stripping of vegetation on slopes greater than 25 percent unless disturbance is for road or utility crossings.
- Analysis of soil stability, erosion control methods, and revegetation plan is required for all earthmoving activities on slopes 15 percent or greater.

Eight of the ten municipalities in this watershed have enacted ordinances, which meet the goals of the model ordinance.

Keeping development away from ridgelines protects both natural resources and a town's scenic views. Washington Township (Morris County) has adopted a "Scenic Vista and Ridgeline Protection" ordinance for these purposes. Referencing a township ridgeline map, it prohibits proposed buildings or structures from extending above the predominant tree line, requires that they be set at least sixty feet from the ridgeline, and prohibits alteration of the view both from and to the natural ridgeline.

Water Quality

The Musconetcong River is widely considered to be a high quality stream in comparison to many other rivers in New Jersey. However, there are indications that water quality may be declining along the more urbanizing reaches of the river.

There are 28 permitted surface water dischargers in the entire Musconetcong watershed, a relatively small number for the size of the watershed. The NJDEP has identified a few of the dischargers as being in violation of their permits. It is suspected that by far the most significant source of pollution comes from nonpoint sources. Some of these include runoff from farms, and urban areas (roads, parking lots, etc.), malfunctioning septic systems, and domestic waterfowl.

Water pollution control in the Musconetcong River is the joint responsibility of the New Jersey Department of Environmental Protection (NJDEP), and the U.S. Environmental Protection Agency. Several other agencies are involved in varying degrees with water quality monitoring, regulatory, planning and other water management activities. These include the Delaware River Basin Commission, US Geological Survey, USDA Natural Conservation Service, NJDEP Division of Fish and Wildlife, and county health departments and soil conservation districts.

The Federal Clean Water Act sets forth minimum water quality standards, and requires states to assess stream quality and list those waterways that are “water quality limited waterbodies.” This list is required by section 303 (d) of the Clean Water Act. NJDEP data contained in the New Jersey 1998 Section 303 (d) report indicates that water quality in some sections of the Musconetcong River does not meet federal minimum standards for several criteria including: ammonia, temperature, fecal coliform, pH, total phosphorus and various heavy metals.

The federal and state point source pollution control programs instituted with the Federal Clean Water Act (1972) resulted in dramatic improvements in water quality for many impaired water bodies. Billions of dollars of public and private funds were spent to build and upgrade municipal and industrial wastewater treatment plants. However, despite the considerable investments and improvement of technology for “end of pipe” discharges, many waterbodies still failed to meet minimum federal water quality standards due to impairment from nonpoint sources of pollution.

The Clean Water Act Amendments of 1987 established programs for managing stormwater, wetlands, groundwater and nonpoint source pollution. During the 1990’s, with the realization that many of the nation’s waterways and coastal waters still suffered from significant pollution problems, the EPA and the states moved toward adopting a watershed approach in their efforts to identify, prioritize and clean up water quality problems.

The New Jersey Department of Environmental Protection (NJDEP) has developed a comprehensive watershed management program as part of a strategy to satisfy state mandates found in Section 303 of the Federal Clean Water Act (1972). Section 303 requires each state to establish water quality

standards for all of its waterbodies, identify those streams and lakes failing to meet the standards, and take action to clean them up.

NJDEP entered into a Memorandum of Agreement with EPA Region 2 to implement a specific timetable within which NJDEP must either establish total maximum daily loads (TMDLs) for all water quality limited segments identified in the New Jersey 303(d) water quality list, or propose the de-listing of specific water quality limited segments.

A TMDL identifies the amount of an offending pollutant (whether a nutrient or a toxic) a stream can assimilate without violating its water quality standards. TMDLs are set on a pollutant-by-pollutant basis. Thermal pollution loads must also be set.

The NJDEP Division of Watershed Management was created in 1999 to implement the state's watershed management program. NJDEP has delineated 20 major Watershed Management Areas (WMAs) in New Jersey. The WMAs are organized under the umbrella of five regional bureaus within the Division of Watershed Management.

The Musconetcong River falls within the Upper Delaware Region of New Jersey, which is designated as Watershed Management Area # 1, or WMA#1. The region encompasses all of the Delaware River tributary watersheds in New Jersey from the Musconetcong north to the New York border. Other major tributary watersheds within WMA#1 include the Pohatcong Creek, Pequest River, Paulinskill River, and Flatbrook River.

In April 1998, the NJDEP Office of Environmental Planning began a three-year watershed management planning initiative for the Musconetcong River watershed with various stakeholder groups. The Musconetcong Watershed Management Initiative was halted in 2000 due to a lack of financial and technical resources, and because the NJDEP decided to expand the watershed planning process beyond the Musconetcong watershed to include all the watersheds within the Upper Delaware Region (WMA#1).

On October 2, 2000, NJDEP contracted with North Jersey Resource Conservation and Development Council to begin the watershed planning process within Watershed Management Area #1. The Council will develop a comprehensive management plan for the entire Upper Delaware Region, including the Musconetcong River watershed.

In addition to the state-led watershed planning effort underway, a number of other efforts have focused on reducing sources of nonpoint pollution. Most significant of these are the various federally funded agricultural programs designed to assist farmers in reducing runoff from croplands, pastures and feedlots. A partnership of state, county and local organizations is working to promote and install riparian buffers to improve water quality and wildlife habitat.

GOAL: Maintain existing water quality in the Musconetcong River and its tributaries and improve where possible.

OBJECTIVE 5.1 Sustain aquatic life and designated uses.

Key Actions

- ⇒ Participate in the NJDEP Upper Delaware WMA#1 watershed planning process.
- ⇒ Support stream-monitoring programs to improve water quality data collection and provide indicators of local stream condition.
- ⇒ Identify and protect aquifer recharge areas and cool temperature springs, which discharge to the river.
- ⇒ Implement agricultural, forestry, and homeowner best management practices to reduce non-point pollutants.

Roles

- > SG/LG/NG/LO
- > SG/LG/NG
- > SG/LG/NG/LO
- > SG/LG/NG/LO

OBJECTIVE 5.2 Manage storm water to prevent non-point source pollution, maintain infiltration and aquifer recharge, and protect aquatic habitat.

Key Actions

- ⇒ Implement public education programs about non-point source pollution.
- ⇒ Encourage storm water management based on the principles of minimal site disturbance, minimal impervious surfaces, opportunities for infiltration, and the use of non-structural practices.

Roles

- > LG/CG/SG/NG
- > LG/CG/SG/NG

OBJECTIVE 5.3 Manage the riparian environment to maintain and enhance water quality in the river and its tributaries.

Key Actions

- ⇒ Ensure maintenance of riparian vegetation through enforcement of state floodplain regulations protecting near watercourse vegetation.
- ⇒ Identify riparian areas in need of restoration and implement cooperative programs to stabilize streambanks and plant woodland species.
- ⇒ Adopt setbacks, stream corridor protection zoning and riparian buffer ordinances, which protect the natural drainage system of the river and its tributaries.

Roles

- > SG/LG
- > SG/LG/NG/LO
- > LG

LO = landowner, LG = local government, CG = county government, SG = state government, and NG = non-governmental organization.

As the relationship between land use and water quality has become more clearly understood, municipalities have begun to revisit zoning provisions that address the issue. The lack of adequate riparian buffer strips along watercourses has been a prime concern, as more pollutants then enter the stream, lowering water quality, and causing other adverse impacts to the stream channel.

Washington Township (Morris County) has adopted a straightforward approach, simply prohibiting buildings or structures within fifty feet of a stream corridor, with limited exceptions, and prohibiting septic systems within a stream corridor, a stream corridor buffer, or one hundred feet of the top of the bank of any stream. Re-vegetation of stream buffers is also required as a condition of any major subdivision or major site plan.

Summary of Recommendations for Local Governments

An underlying principle of the management plan is that existing authorities will continue to provide the foundation for the long-term protection of the Musconetcong River, its tributaries and its watershed. Local commitment is necessary to protect the natural, cultural, and recreational features of the river for the benefit and enjoyment of present and future generations. Local support for actions to maintain and improve the Musconetcong River and its tributaries is needed to achieve designation of eligible segments as a National Wild and Scenic River.

Local support can be demonstrated by local governments through endorsement of the goals of the Musconetcong River Management Plan and through incorporation of the goals and key actions into municipal master plans, zoning and land development regulations. The management plan identifies outstandingly remarkable values within the river corridor, including historic sites and districts, recreational lands and uses, scenic vistas, and critical wildlife habitat. Local governments will want to review these maps and consider adopting resource protection strategies and land use planning tools which support long-term protection of these river-related resources.

A River Management Committee will be created to facilitate the implementation of the plan. Local governments will be requested to appoint a representative to participate in this committee to enhance cooperation and coordination in addressing river-related issues affecting all watershed residents.

Glossary

Agricultural Use:

A use involving the production, keeping, or maintenance for sale, lease or personal use plants and animals useful to man, including but not limited to forages, grain, seed crops, dairy animals, poultry, beef, sheep, horses, pigs, bees, fur animals, trees, food of all kinds, vegetables nurseries, and land devoted to soil conservation or forestry management programs.

Anti-Degradation Policy:

A policy to adhere to the anti-degradation clause: A provision in air quality and water quality laws that prohibits deterioration of air or water quality in areas where the pollution levels are presently below those allowed.

Aquifer:

An underground bed or stratum of earth, gravel or porous stone that contains a useable supply of water.

Aquifer Recharge:

Replenishment of a useable supply of groundwater by infiltration of rainfall or water which infiltrates the soil.

Best Management Practices:

A practice or combination of practices for preventing or reducing diffuse or nonpoint sources of pollution to a level compatible with water quality goals.

Boundary:

A map line that defines the area of national interest in the Musconetcong River Corridor. The area to be protected through local laws, plans and ordinances, and the use of other existing laws.

Classification:

Under the Wild and Scenic Rivers Act, a system for assessing existing development levels and for directing future management; the proposed classifications on the Musconetcong River are scenic and recreational.

Clustering:

Clustering involves the arrangement of residential building lots in groups through a reduction in lot area and building setback requirements while still adhering to permitted density regulations. This allows the remaining area of the development to be incorporated as open space, often based upon the preservation of environmentally sensitive areas (i.e., woodlands, wetlands, floodplains, or severely steep slopes).

Conservation Easement:

A flexible legal instrument that protects land while leaving it in private ownership. A landowner generally donates the easement to a qualified conservation organization or government agency, which in turn ensures that the conditions of the easement are met over time.

Critical Habitat:

The area of land or water that is crucial to the survival of either a plant or animal species.

Cultural Resources:

Tangible and intangible features, animate or inanimate, that provide information about a cultural system; this may include human history, archaeological sites, industrial remnants and architectural features.

Designation:

The process whereby rivers are added to the National Wild and Scenic Rivers System by an act of Congress or by administrative action of the Secretary of the Interior with regard to state-designated rivers and Section 2(a)(ii) of the Wild and Scenic Rivers Act.

Easement:

A partial interest in land.

Feedlot:

A lot or building, or a combination thereof, intended for the confined feeding, breeding, raising or holding of animals and specifically designed as a confinement area in which manure may accumulate; or in which the concentration of animals prevents maintenance of a vegetative cover within the enclosure. Open lots used for the feeding and rearing of poultry are considered feedlots.

Fish and Wildlife:

A division of the NJDEP whose mission is to manage the characteristics and interactions of fish and wildlife populations and their habitats in order to promote, protect or enhance the ecological integrity of those populations.

Floodplain:

The channel of a natural stream and the relatively flat area adjoining the channel, which has been or which may be covered by flood water, including, at a minimum, those areas designated by the Federal Insurance Administration and/or the Federal Emergency Management Agency as "flood hazard areas."

Forestry:

The management, including growing or harvesting, of a forest, woodland or plantation, including the construction, alteration or maintenance of woods, roads, landings and related research and educational activities.

Headwaters:

The waters from which a river rises. Referring to the source of a river or stream.

Historic District:

One or more historic sites and intervening or surrounding property united historically or aesthetically by plan or physical development. A district may also comprise individual elements separated geographically but linked by association or history.

Impervious Surface:

Hard surfaces which are impermeable to rainfall, such as roof tops, roads, parking lots, driveways and sidewalks.

Impoundment:

Any body of water located on a tributary, brook, stream, kill or river formed by a new manmade structure within the boundary of the designated river; this does not include structures for fishery management.

Jurisdiction:

The limits or territory within which authority may be exercised.

Karst Topography:

A terrain, generally underlain by limestone in which the topography is chiefly formed by the dissolving of rock. It is commonly characterized by closed drainage, subterranean drainage and caves.

Landfill:

Site where trash or refuse, including toxic or radioactive waste, is buried as part of a public or private business operation.

Lot Averaging:

Lot averaging is similar to clustering in that both methods allow some variation in minimum lot size regulations. However, with the lot averaging technique common open space areas are not typically created nor is overall density typically modified. Larger lots are designed to avoid encroachment into environmentally sensitive areas, while still providing adequate area for residential construction. The zoning ordinance generally requires a minimum lot size for each specific zoning district.

Lot:

A parcel of land designated by metes and bounds, registered land survey, auditor's plot or other accepted means; and separated from other parcels or portions by the description for the purpose of sale, lease, or separation of the parcel or portion.

Open Space Set Aside:

Any parcel or area of land or water set aside in a development.

Overlay:

A zoning district that encompasses one or more underlying zones and that imposes additional requirements above that required by the underlying zone.

Restrictive Covenant:

Provision in a deed limiting the use of the property and prohibiting certain uses.

Ridgeline:

A line connecting the highest points along a ridge and separating drainage basins or small-scale drainage systems from one another.

Riprap:

A layer, facing or protective mound of rubble or stones randomly placed to prevent erosion, scour, or scouring of a structure or embankment; also the stone used for this purpose.

Riparian Buffer:

A vegetated area near a stream, usually forested, which helps shade and partially protect a stream from the impact of adjacent land uses.

Riparian:

Belonging or relating to the bank of a natural course of water.

Setback:

The minimum horizontal distance from a lot line, shoreline or road to the nearest part of a structure.

Wetland:

An area where hydric soils are saturated by surface and/or ground water long and frequently enough during the growing season to support a dominance of hydrophytic vegetation.

Selected Bibliography

Lower Delaware River Management Plan. August 1997. National Park Service, Phila., PA

Lower Delaware Wild and Scenic Study Report. May 1999. National Park Service, Phila., PA

Musconetcong River National Wild and Scenic River Study Resource Assessment and Eligibility & Classification Draft Report. August 1999. National Park Service, Boston, MA

Sudbury, Assebet and Concord Wild and Scenic River Study, River Conservation Plan. March 1995. National Park Service, Boston, MA

Sudbury, Assebet and Concord Wild and Scenic River Study, Draft Report. September 1996. National Park Service, Boston, MA

Upper Farmington River Management Plan. April 1993. National Park Service, Boston, MA

White Clay Creek and Its Tributaries Watershed Management Plan with Reference Sections. n.d. National Park Service, Phila., PA

Wild and Scenic Rivers Reference Guide. March 2000. Interagency Wild & Scenic Rivers Coordinating Council, National Park Service

List of Participants

Musconetcong Advisory Committee

Allison Irland	Hackettstown	Warren
Al Kleinschrodt	Washington Township	Morris
Gottfried Pletzer	Lebanon Township	Hunterdon
Joyce Koch	Bethlehem Township	Hunterdon
David Thomas	Bloomsbury Borough	Hunterdon
Greg Sumner	Bloomsbury Borough	Hunterdon
Susan Dickey	Washington Township	Warren
Janice Eppler	Mansfield Township	Warren
Merle Morris	Mansfield Township	Warren
Ed Sekula	Netcong Township	Morris
Maria Elena Jeannette	Holland Township	Hunterdon
Art Biggs	Holland Township	Hunterdon
Donna Koenig	Byram Township	Morris
Stacy D'Onofrio	Byram Township	Morris
Henry Meltzer	Franklin Township	Warren

Additional Participants

John Brunner	Musconetcong Watershed Association
Sharon Yates	Heritage Conservancy
Gary Bowles	Heritage Conservancy
Richard Cotton	Musconetcong Watershed Association
Jamie Fosburgh	National Park Service
Cassie Thomas	National Park Service
Bill Sharp	National Park Service
Paul Kenney	National Park Service
Sabine von Aulock	Morris County Planning Board
Greg Sipple	Warren County Planning Dept
Wayne & Edie Martin	Lebanon Twp residents
Cinny MacGonagle	Bethlehem Twp resident
Pete Martin	Lebanon Twp resident
Valerie Salice	NJ Div. Parks & Forestry, ONLM
Caroline Armstrong	Hunterdon County Planning Board
Agust Gudmundsson	Trout Unlimited
Wilma Frey	Highlands Coalition

Appendix A: Regulatory and Non-Regulatory Programs

Regulatory Programs

Regulatory programs are based on laws and regulations at the federal, state, regional, county and municipal levels. Many landscape features such as wetlands, floodplains and steep slopes are regulated to limit environmental degradation and protect resource values and property. An overview of some of the existing regulatory programs in the study area is included below.

Two of the state Land Use Regulations that affect the river corridor are the Flood Hazard Control Act and the Freshwater Wetland Protection Act. NJ State Flood Control law regulates activities in the floodplain, including the placement of fill and the removal of riparian vegetation within 50 feet of the top of the channel of the river. In addition, NJ State Freshwater Wetlands law regulates activities in wetlands and transition areas of 50 to 150 feet around wetlands in the Musconetcong watershed. These regulations provide basic protections to the river corridor. Within the eligible, sections an additional 15 percent of the river corridor is regulated floodplain, freshwater wetlands or wetland transition areas.

At the local level, a review of municipal zoning and land development ordinances was conducted to determine if municipalities have established goals to protect natural resources and determine what measures have been adopted to meet these goals.

In general, many communities have goals and objectives in their master plans which benefit the river corridor. These goals include:

- protection of critical resources,
- limiting development in natural hazard areas,
- preservation of stream corridors,
- protection of scenic views,
- preservation of farmland, and
- establishment of a river greenway.

The mechanisms to implement these goals are varied. Many communities have zoned the undeveloped sections of the river corridor for agricultural and low density residential uses. Several ordinances allow for lot averaging, clustering and open space set asides, either as options or requirements. When wetlands, floodplains and stream corridors are identified as resources to be preserved in open space or through clustering, these mechanisms may be effective in establishing building setbacks from the river and its tributary streams.

Many master plans identify protection of water resources and preservation of stream corridors as a goal, and a few have adopted stream setbacks or riparian buffer ordinances.

Gaps in resource protection along the river were identified in several locations and recommendations for actions to ensure long-term protection were developed by the Advisory Committee to address these issues. These

actions were incorporated into the river management plan and are discussed in Section IV of this report.

Resource Focus: Water Quality

Federal programs

Clean Water Act, 33 U.S.C. 1251 et. seq.

The Clean Water Act of 1977 provides, among other things, that “fishable/swimmable” waters wherever attainable shall be the objective of the national policy. It provides the directives to restore and maintain the chemical, physical and biological integrity of the nation’s waters.

Federal Water Pollution Act of 1972, U.S.C. 1988 Title 33 SS.1251 et seq.

The purpose of this act is to restore and maintain the chemical, physical and biological integrity of the nation’s waters. In order to achieve this objective, the Congress recognizes that it is a national goal to eliminate the discharge of pollutants into navigable waters; wherever attainable, an interim goal of water quality that provides for the protection and propagation of fish, shellfish and wildlife, and provide for recreation in and on the waters of the nation. It is national policy that area-wide waste treatment management processes be developed and implemented to assure adequate control of sources of pollutants in each state and that federal financial assistance be provided to construct publicly owned waste treatment works.

The Army Corps of Engineers regulates waterways and wetlands through permits the discharge of dredge and fill material into U.S. waters (including wetlands) under authority of Section 404 of the Federal Clean Waters Act and Section 10, Rivers and Harbors Act of 1899.

Any individual, company, corporation or government body planning construction of fill activities in the waters of the United States, including wetlands, must obtain a permit from the Corps of Engineers. In general, the Corps of Engineers has jurisdiction over all construction activities in tidal and/or navigable waters, including adjacent wetlands shoreward to the mean high water line. In other areas such as non-tidal waterways, adjacent wetlands, isolated wetlands, forested wetlands and lakes, the Corps has regulatory authority over the discharge of dredged or fill material. Permits are required for activities such as: bulkheads, piers, boathouse, pilings, excavation, dredging, filling and depositing dredged materials in waters and wetlands, and overhead and underwater transmission lines, cables and pipes.

Regional programs

Delaware River Basin Commission

In 1961, the federal government and the states of New York, New Jersey, Pennsylvania, and Delaware, recognizing the regional and national significance of the water and related sources of the Delaware River Basin, created the Delaware River Basin Commission. The purpose of the Commission is to adopt and promote coordinated policies for water conservation, control, use and management of the Basin. The powers granted to the Commission to

plan and regulate water conservation and use in the Basin place it in a central river management role, particularly for water supply and quality issues. The Commission's powers include:

1. **Water Supply** – To develop and implement plans for the use of Basin water for domestic, municipal, agricultural and industrial water supply.
2. **Pollution Control** – to conduct studies, and develop and maintain projects and facilities to control potential and existing pollution.
3. **Flood Protection** – to plan and develop projects and facilities for flood damage reduction.
4. **Watershed Management** – to promote sound watershed management, including projects and facilities to retard runoff and water flow and prevent soil erosion.
5. **Recreation** – to provide for the development of water related public recreational facilities.
6. **Hydroelectric Power** – to develop or authorize dams and related facilities for generating hydroelectric power.
7. **Regulation of Withdrawals and Diversions** – to regulate and control withdraws and diversions from surface and ground waters.
8. **Intergovernmental Relations** – to avoid conflicts of jurisdiction all projects related to the powers delegated by the Commission must be undertaken in consultation with the Commission.
9. **Capital Financing** – to borrow money for the purposes of the Delaware River Basin Compact.

DRBC is required to adopt a Comprehensive Plan that guides development of the Basin's water resources as a management and regulatory mechanism. It includes codification of administrative decisions governing water resources use, development and conservation.

The Water Code of the Basin (March 1994) establishes policy for 1) conservation, development, and utilization of Delaware River Basin Water Resources, and 2) water quality standards for the Basin. Water conservation policy includes requiring maximum feasible efficiency in the use of water by new industrial, municipal and agricultural users and eventual application of feasible conservation practices by existing users. The Water Code establishes priorities of water use during drought emergencies, determined in part by stream flow objectives at Trenton, NJ. Water quality standards include an antidegradation policy for interstate waters to maintain existing water quality where existing water quality is better than the established stream quality objectives, with certain caveats. The antidegradation policy includes a no measurable change for designed special protection waters with exceptionally high scenic, recreational, ecological, and/or water supply values.

State programs

Flood Hazard Area Control Act of 1962, N.J.S.A. 58:16a-66 et seq.
To delineate flood hazard areas, review and process stream encroachment applications in accordance with program regulations.

Freshwater Wetlands Protection Act of 1987, N.J.S.A. 13:9B-1 to 13:9B-23 et seq.

The purpose of the Act is to preserve the purity and integrity of the state's remaining wetlands by expanding the state's jurisdiction beyond tidal waters and providing a basis for assuming the federal program.

Safe Drinking Water Act, N.J.S.A. 58:12A-1, et seq.

The Act regulates pollutants in drinking water supplies, and empowers DEP to promulgate and enforce regulations to purify drinking water prior to distribution and to assume primary enforcement under the Federal Safe Drinking Water Act through the imposition of primary and secondary drinking water standards, limits on hazardous contaminants in drinking water, and standards for construction of public water systems.

The Wetlands Act of 1970, N.J.S.A. 13:9A-1 et seq.

Authorizes the Commissioner of DEP to regulate alternatives of, or activities in, coastal wetlands by issuing, revising, or repealing orders that form the basis for issuing permits.

Water Pollution Control Act, N.J.S.A. 58:10A-21 to 58:10A-37 et seq.

To facilitate restoration and maintenance of unpolluted surface and ground waters of the state.

Water Quality Planning Act, N.J.S.A. 58:11A-2 to 58:11A-11 et seq.

To restore and maintain the chemical, physical and biological integrity of the waters of New Jersey.

Resource Focus: Natural Resources

Federal programs

Endangered Species Act of 1973, 16 U.S.C. 1531 et seq.

The Act provides means to ensure that endangered and threatened species are conserved and protected and that their continued survival is ensured. The Act mandates that all federal agencies will take action to ensure that their activities do not jeopardize endangered species or habitats critical to their survival.

National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321-4347 et seq.

Section 102 of the Act directs that "to the fullest extent possible: the policies, regulations and public laws of the U.S. shall be interpreted and administered in accordance with the policies set forth in this Act, and all agencies of the federal government shall...insure that presently unquantified environmental amenities and values may be given appropriate considerations in decision-making along with economic and technical considerations".

National Wild and Scenic River Act, 16 U.S.C. 1271-1287

Certain selected rivers of the nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other values, shall be preserved in free-flowing condition, and they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations.

State programs

Endangered and Non-Game Species Act, N.J.S.A. 23:2A-1 to 23A-13 et seq.

Endangered wildlife indigenous to New Jersey that are found to be endangered should be accorded special protection in order to maintain them and, to the extent possible, enhance their numbers. The Act can, in extreme cases request a resort to condemnation procedures, when it feels that proposed development poses a detrimental risk to endangered wildlife species.

Municipal Conservation Commission Act, N.J.S.A. 58:16A-50 to 16A-66 et seq.

The Act allows environmental commissions to acquire and administer property by gift, grant, bequest or lease. This statute also allows for the creation of joint environmental commissions by municipal ordinance. In view of the disparity in zoning practices from one municipality to another, this statutory device holds promise for joint action to preserve and protect common environmental elements by monitoring use and development.

Municipal Land Use Law, N.J.S.A. 40:55D-2 to 40:55D-20 et seq.

The legislation is intended to provide sufficient space in appropriate locations for a variety of agriculture, residential, recreational, commercial and industrial uses, as well as open spaces, according to their respective environmental requirements. The statute encourages planning boards to design a conservation plan that provides for the preservation, conservation, and utilization of natural resources, including water supply, forests, soil, marshes, wetlands, fisheries, endangered or threatened species, and other natural resources.

The **Natural Areas** (N.J.S.A. 13:1B-15.4 et seq.) and **Natural Areas Systems Act** (N.J.S.A. 13:1B-15.12a et seq) establish a system of State Natural Areas for the protection of natural resources for present and future New Jersey residents. The System is currently comprised of 42 Natural Areas encompassing 38,579 acres of state-owned lands. Rules promulgated at N.J.A.C. 7:5A-1.14 allow any individual or organization to suggest that a site be included on the Register of Natural Areas. The Register is a list of sites, public and private, which serve as official recognition of the site's important natural features that are worthy of preservation by the property owner. It is also a list of sites from which to draw new areas for designation to the Natural Areas System. This process could allow for the protection of state-owned lands that support endangered and threatened species of plants and animals, unique and representative natural communities, and significant wildlife habitats.

New Jersey State Planning Commission Act, N.J.S.A. 52:18A-196 to 52:18A-205 et seq.

The significance of this Act rests upon the fact that this is the only statewide planning mechanism in New Jersey; the purpose is to integrate and coordinate state planning to conserve natural resources.

New Jersey Wild and Scenic River Act, N.J.S.A. 13:8-45 to 13:8-63 et seq.

The purpose is to preserve and protect New Jersey rivers, together with adjacent land areas possessing outstanding scenic, recreational, geologic,

fish and wildlife, floral, historic, cultural, or similar values that are public trust.

New Jersey Environmental Rights Act, N.J.S.A. 2A:35A-1 et seq.

This Act allows any person to maintain an action in a court of competent jurisdiction against any other person to enforce, or to restrain the violation of any statute, regulation, or ordinance which is designed to prevent to minimize pollution.

Soil Erosion and Sediment Control Act, N.J.S.A. 4:29-39 et seq.

All major land development activities must be carried out with regard to the control of soil erosion and sedimentation. The Act calls for the creation of land use regulations with districts in order to conserve soil resources, while preventing and controlling soil erosion

Resource Focus: Historic and Cultural

Federal programs

Archeological Resources Protection Act, P.L. 96-95 Stat.721

To meet an urgent need to provide greater protection for archeological resources on federally controlled public lands and on Indian Lands, Congress enacted Public Law 96-95. It was signed into law on October 31, 1979

The Act had two fundamental purposes “to protect irreplaceable archeological resources on public lands and Indian lands which are subject to loss or destruction from actions of persons who would excavate, remove, damage, alter or deface them for commercial or personal reasons; and to increase communications and the exchange of information among government authorities, the professional archeological community, collectors, Native Americans and the general public toward the goal of protecting and conserving archeological resources nationwide.”

National Historic Preservation Act, 16 U.S.C. 470 to 471

This Act provides for the protection and enhancement of sites associated with events that have made a significant contribution to the broad patterns of our history; or are associated with the lives of persons significant in our past; or embody the distinctive characteristics of a type, period, or method of construction; or represent the work of a master; or otherwise have high artistic or specific value; or have the ability to yield information important to history. This act applies to all federal actions or federally funded actions.

Native American Graves Protection and Repatriation Act, 25 U.S.C. 3001, 3002

The regulations set forth by this Act to develop a systematic process of determining the rights of lineal descendants and members of the Indian Tribes to certain Native American human remains and cultural items with which they are affiliated. These regulations include procedures related to the intentional excavation and inadvertent discovery of human remains or cultural items from federal or tribal lands.

State programs

New Jersey Register of Historic Places Act NJSA 13:1B.128

Establishes the State Register of Historic Places.

NJSA 13:1B-15.131

Requires state, county or municipality to determine whether any of their undertakings encroach upon state register properties and, if so, to provide information on the project to the commissioner of DEP. All state register encroachment projects require authorization from the commissioner of DEP.

Non-Regulatory Protection Programs

Regulatory methods to protect river resources often suffer from lack of coordination throughout the watershed. Regulations are also subject to failure when funding is insufficient, staffing inadequate, property owner equity is not considered, or when regulations fail to consider the cumulative impact of multiple projects on a resource. An effective tool to provide long-term protection of resources is often a non-regulatory program.

There are numerous such programs in place in the study area. Some of the most important programs are those that provide for the permanent preservation of open space through land acquisitions and easements. Most lands in the watershed are being preserved through the NJ Green Acres program, the county and state farmland preservation programs, or the Hunterdon County Parks program. In addition, eleven of the municipalities in the study area have dedicated funding for open space acquisitions. As a result of these efforts over 1,754 acres of land are permanently preserved within the eligible sections of the river corridor.

State programs

New Jersey Farmland Preservation Program

In 1981, New Jersey established the Farmland Preservation Program. The Agriculture Retention and Development Act is the framework of the program. The primary purpose of the program is to strengthen the agricultural industry and preserve important farmlands to enhance the economy and quality of life in the state. Under this program development rights are donated or sold to the State Agriculture Development Committee or County Agriculture Development Board (SADC or CADB). Farms may also be purchased by the SADC and subsequently auctioned after deed restrictions are in place. All four counties in the Musconetcong watershed have established County Agriculture Development Boards.

Green Acres Program of the Department of Environmental Protection

The Green Acres Program was created in 1961 to meet New Jersey's growing recreation and conservation needs. In the first Green Acres bond referendum, the legislature declared that "the provision of lands for public recreation and conservation of natural resources promotes public health, prosperity, and general welfare and is a proper responsibility of the government." Over the years, New Jersey's voters have overwhelmingly approved nine bond issues totaling more than \$1.4 billion. As a result, the state of New Jersey has acquired or assisted municipalities and non-profit conservation organizations to acquire over 440,000 acres of open space. The

goal of this program is to protect one million acres of open space and farmland over the next decade.

New Jersey State Development and Redevelopment Plan 2001

In 1985, the New Jersey Legislature adopted the State Planning Act (N.J.S.A. 52:18A-196 et seq.). In the act, the legislature declared that the state of New Jersey needs sound and integrated “statewide planning to conserve its natural resource, revitalize its urban centers, protect the quality of its environment, and provide needed housing and adequate public services at a reasonable cost while promoting beneficial economic growth, development and renewal...” The state plan is not a regulation but a policy guide for state, regional and local agencies to use when exercising their delegated authority.

In response to a petition from environmental organizations and local governments submitted during cross-acceptance, the New Jersey Highlands, which includes the Musconetcong watershed, have been recognized in the New Jersey State Plan as a special resource area. This demonstrates the Highlands’ critical importance to the state and provides assistance for coordinated planning efforts.

New Jersey Trails Plan

The 1996 plan is a major component of the New Jersey’s State Trails Program efforts, with the purpose of preserving and expanding trails and trail systems throughout the state by incorporating these as part of a state trails system, and providing a planning guide for establishing trails. The Musconetcong River is one of seven waterways eligible for the New Jersey State Trails System. This waterways trail includes 31 miles of river from Lubbers Run in Allamuchy State Park to Bloomsbury.

Appendix B: Analysis of Existing Resource Protection

Preservation of outstanding river resources is a primary goal of the National Wild and Scenic Rivers Act. The long-term protection of the river corridor, lands immediately adjacent to the riverbanks, and the outstandingly remarkable resources is necessary in order to maintain the integrity of the river system and for the eligible river segments to be suitable for designation in the National Wild and Scenic program.

Protection of lands within the corridor was determined based on two levels of assessment: 1) the status of ownership for conservation purposes, and 2) local and state land use laws.

Identification of lands, which are designated for public use and conservation purposes, were determined from the NJ Highlands report – An Inventory and GIS Mapping of Open Space and Undeveloped Land, Hunterdon County GIS data, and data from the North Jersey Resource Conservation & Development Council. This mapping provided a supplement to the Green Acres data previously available to the study team. Open space lands, which are not subject to long-term conservation restrictions, were not considered as protected for our purposes.

Local land use laws and regulations that protect natural resources or provide incentives and setbacks were evaluated in a preliminary way for each river municipality. This evaluation was done based on a review of master plans and land development ordinances available at the county planning board offices.

Protections afforded by state land, use laws that protect the river corridor, including wetlands, floodplains, and critical areas were also evaluated. This analysis provides a summary of the level of protection currently provided by these mechanisms and the potential for the maintenance and enhancement of river resources values in the future. Threats to the corridor and gaps in the protection of river resources are addressed in the management plan.

Corridor Summary

The following findings are estimates based on readily available land use data, reviews of county files for master plans and municipal land development ordinances as of January 2000. Only the 14 municipalities in the sections considered eligible for wild and scenic designation were evaluated.

Approximately 16 percent of the river corridor lands (land within one-quarter-mile of the river) in the 14 river municipalities are protected from incompatible land uses through ownership by state or local governments. These lands include 467 acres of municipal and county owned lands and 1,063 acres of state owned lands.

The banks of the river form approximately 57 miles of riverfront within the sections considered eligible for wild and scenic designation. Approximately 11.8 miles (or 20 percent) of this frontage is currently public land.

An additional four-percent of the river corridor lands are protected through conservation or agricultural easements on private land in Bethlehem Township. Recent additions to the farmlands preservation program in Warren County, principally in Pohatcong, Franklin and Washington townships will increase the total acreage of properties subject to easements within the river corridor. The remaining 11 municipalities have no privately protected lands in the river corridor according to the county files.

Approximately 15 percent of the remaining river corridor lands are floodplain, wetland or wetland transition area regulated by the state. Some portion of this wetland and wetland transition area is in agricultural production and exempt from some state wetland regulations.

Allamuchy Township

Land use along the river corridor from Saxton Falls to Hackettstown is primarily parkland and low density residential. Approximately 72 percent of the river corridor lands in the township are within Allamuchy Mountain State Park. To the right of County Road 604 the state parkland is designated as a natural area. Less than 800 feet of riverfront is privately owned within the township's river corridor. This area is zoned single family residential (SFR). No sewer service is present or proposed in this area. Critical areas in the township have been identified and mapped including freshwater wetlands, 100-year floodplain, and slopes in excess of 15 percent. Permitted uses within the floodplain include overflow parking and detention basins. No structures or septic systems are permitted within the floodplain.

The Master Plan (dated 1993) recommends preservation of priority stream corridors, including the Musconetcong River, through conservation easements of 150 feet from each bank or greater if the floodplain extends further.

Hackettstown

The Town of Hackettstown is a densely developed town center in the river corridor. The downstream portions of the riverfront were determined to be ineligible for designation as wild and scenic. Zoning along the riverfront includes highway commercial (HC), Apartments (APT), limited manufacturing (LM), community commercial (CC), health facilities (HF), and residential (R-30, R-12.5/OFF). Approximately 23 percent of the riverfront is preserved as state park, fish and game lands, or community park. The remaining undeveloped riverfront lands would be developed subject to the town's natural features ordinance which seeks to minimize changes in existing grades and preserve natural features. Natural features to be preserved include: trees > six-inches in diameter, wooded areas, brooks, hilltops, view and vistas, rock outcrops, wetlands, steep slopes, seasonal high water lands, and surface and water bodies. In addition, critical areas are to be preserved as undeveloped open space including: wetlands, significant trees, floodplains, slopes > 25 percent, habitat of state or federally listed rare, threatened or endangered species, and historically significant structures.

Although the undeveloped lands along the river are zoned for high-density residential and commercial uses, the implementation of the town's natural features ordinance should allow for the preservation of the remaining riverfront as open space.

Mount Olive Township

Lands along the riverfront are comprised of public parklands and residential developments. State parklands comprise 54 percent of the river corridor in Mount Olive and there is little or no potential for additional development in the remaining river corridor lands. A comprehensive natural resources inventory of the township completed in 1988 identified the many critical features and limitations to development in the watershed. The township's critical areas ordinance prohibits development in critical wetlands, flood hazard areas, slopes in excess of 25 percent, and surface waters. The 1988 Master Plan indicates the Musconetcong watershed and river corridor as conservation and open space with many limitations due to natural features, groundwater recharge and quality, flood hazard and wetlands. The draft Open Space and Recreation Plan, dated May 1999, identifies the forested ridge above the Musconetcong River and the preservation of naturally vegetated corridors along streams, rivers and lakes as priorities. Undeveloped parcels in the watershed below Saxton Falls are zoned for rural residential (1DU/ five acres).

Washington Township, Morris County

The Township master plan and reexamination adopted in 1995 include the following goals and objectives: establish a center in the northwest portion of the township; develop a greenways plan and a system of hiking, bicycle and equestrian routes; provide for conservation easements for critical features; recognize and protect unique views and vistas; and establish a ridge protection ordinance. The designated center in the northwest portion of the township includes Hastings Square and Peachtree village and is adjacent to Hackettstown, a regional center. This area along the Musconetcong River is served by public sewer and water and is zoned for multi-family residential, golf course, commercial and industrial/office uses. This section of the river was determined not to be eligible for designation as wild and scenic.

The remainder of the riverfront downstream from Schooleys Mountain Road (Route 24) is zoned for residential use (R3, minimum lots of less than three acres), with the exception of the municipal wastewater treatment plant and three existing hamlets, zoned R20 (minimum lots of less than one-half-acre).

Two municipal parcels along the corridor are designated for water treatment use. A proposed expansion of the existing wastewater treatment plant would increase the design capacity from 1.65 to 3.3 MGD to serve the township and portions of five surrounding municipalities.

A Greenways Plan and Trails Map were both adopted in 1999, however the Musconetcong River corridor was not specifically identified in either plan. The Greenways Plan provides for an overlay district in large portions of the township which encourages protection of critical features and consideration of linkages through clustering of development. Additional overlay districts are provided for Agricultural Use, Carbonate Area Restrictions and Historic Preservation. The Historic Preservation Overlay zone does not include any areas of the Musconetcong watershed.

Washington Township also requires that developers convey conservation easements to the township for steep slopes, ridgelines, streams and wetlands. Watercourses and other waterbodies are protected by a minimum setback of 95 feet on each streambank. The riparian area is dedicated to the township and is restricted from removal of vegetation, topsoil or mineral excavation, erection of structures, and the placement of fill. Steep slopes and ridge protection is provided by ordinance. All activities on slopes 15 to 25 percent are subject to township review. Only transitional grading is permitted on slopes 25 to 30 percent and no disturbance is permitted on slopes in excess of 30 percent. Within 100 feet of the ridgeline no buildings or structures with heights above the ridgeline are permitted. No structures or disturbance other than access are permitted within 60 feet of the ridgeline.

The township has a strong Erosion and Sediment Control ordinance with provisions for local enforcement by the township engineer, and a Stormwater ordinance designed to address water quality as well as the typical water quantity concerns. New ordinances are being developed to address forest management and stream buffers.

Lebanon Township

Lebanon Township clearly states its intent to protect natural resources within its boundaries through its master plan. One such goal statement reads in part, “all development in environmentally sensitive areas should be sharply restricted. Orderly and controlled development patterns must be maintained within the limits of available water supplies, capacity for sewage effluent disposal, and preservation of natural beauty.”

The master plan lists specific limitations to development as being “groundwater, septic, base flows, steep topography, floodplains, swamps, and poor soils.” It also cites the importance of streams for trout spawning and is one of few municipalities to include watershed protection language. “Preserving the ecological value and scenic beauty of these streams will require careful land use management in their watersheds.”

Anyone proposing a major development or land disturbance will find a clear intent on the part of the township to protect sensitive environmental features coming into the process. However, the actual level of protection for resources in certain land development ordinances leaves natural resources at risk. This is particularly true for the floodplain regulations, stormwater requirements, and erosion control for construction.

Most of the river corridor in Lebanon Township is zoned R5. This zoning designation allows for five-acre zoning. There are limited areas of R 1 1/2 comprised of the villages of New Hampton and Changewater, and a limited R3 area exists around Penwell.

Because the river flows more closely to the mountain within the Lebanon Township portion of the Musconetcong valley, there is less level land than in most of the other townships bordering the river. A Tree Ordinance prohibits tree cutting on slopes of 25 percent or more with the stated purpose being to “control drainage and soil erosion.”

Land Subdivision Ordinance (17-8.5b) “Drainage and Conservation” offers strong language for resource protection: “where a subdivision is traversed by a watercourse, drainageway, channel or stream, or where it is desirable to preserve other areas within a subdivision because of soil conditions, rock outcroppings, tree masses, wildlife habitat, vistas, or other significant horticultural, environmental or natural features, there shall be provided a drainage and/or conservation easement of sufficient area and width to protect and preserve the aforementioned features.”

The ordinance further sets forth limitations on vegetation removal (except where there is a forest management plan), topsoil removal, and filling.

The above ordinance can potentially be an effective tool to protect the river and its related resources. However, since there are no specific standards, mechanisms or responsibilities set for identifying sensitive resources, or for determining what level of protection is needed, the ordinance relies on the ability of the township to negotiate on a case-by-case basis with developers for adequate protection of natural resources.

The floodplain ordinance references the state regulations and allows for building in the floodplain if the engineer determines the first floor is above flood level. The later seems to contradict the aforementioned “Drainage and Conservation” ordinance.

Hampton Borough

Riverfront lands in Hampton include a Borough park, a small zone of Highway commercial along Route 31, and two residential zones. The majority of the riverfront which lies downstream from the Route 31 bridge is zoned Rural residential (RR5). This area is the source of the local water supply, an aquifer recharge area over a limestone formation susceptible to groundwater contamination. The town well is located in this zone. Minimum lot size is five acres and cluster development with a 45 percent open space provision is permitted. The remaining riverfront area upstream from Route 31 is zoned residential (R2) and allows for two-acre lots. Limiting factors to development in this area include clay soils which limit the use of septic systems.

Natural features ordinances address stormwater control and development of steep slopes. The rate of stormwater runoff must not be increased and groundwater recharge capacity must not be decreased with development. Detention must be designed to contain any excess post-construction volume of runoff. The steep slope development control applies only to the R5 zone at the higher elevations in Hampton. This ordinance discourages development on slopes greater than 30 percent and limits impervious surface to 50 percent permitted on slopes 11 to 19 percent and 20 percent of that permitted on slopes 20 to 29 percent.

Bethlehem Township

Bethlehem Township provides protection for the Musconetcong River and its immediate corridor through a combination of techniques including zoning, open space acquisition, and the Farmland Preservation Program. Of the latter category, 281 acres of farmland within the river corridor are currently

protected through agricultural easements. Moreover, a substantial wooded buffer exists along much of the Agricultural Preservation stretch of the river.

The township also purchased the Vliet Farm, which fronts the river just above Bloomsbury, protecting 115 acres within the river corridor. State lands within the corridor total 142 acres resulting in approximately 25 percent public ownership of the river corridor in this township.

Those areas not protected through farmland preservation or municipal open space are zoned as Agricultural Residential (AR). This zoning designation allows for six-acre zoning or optional cluster building with a 70 percent open space requirement. A small area across from the village of Asbury is designated Manufacturing which reflects the existence of the graphite mill along the river. A Residential, Office, Manufacturing district (ROM) exists just above Bloomsbury. Virtually the entire river corridor lies within a Carbonate District Overlay which carries with it additional protection in the form of a Limestone Features ordinance.

Protection of the Musconetcong tributaries is critical to maintaining water quality within the river itself. Bethlehem Township has adopted a Mountain Residential District (MRD) designed to protect steep slopes. The MRD calls for five-acre zoning with mandatory clustering and 70 percent open space, as well as a minimum 100-foot buffer for streams and wetlands. While the MRD requirement does not apply to the river corridor, it does afford significant protection for several tributaries and their headwaters on Musconetcong Mountain.

The township land use and development ordinance (1997) includes a Natural Features ordinance that covers floodplains, wetlands, steep slopes and limestone features. The township does not have ordinances covering stormwater management and erosion control.

The township master plan was adopted in 1984 and has since been amended numerous times, making it difficult to understand exactly what is “on the books.” The master plan was last re-examined in 1994, and the planning board is currently conducting an update.

Bethlehem recently completed a Greenway and Open Space Plan adopted and incorporated into the Master Plan in 1999. The plan was developed to “set guidelines to preserve open space including farms and environmentally sensitive areas.” The plan identifies two methods for open space preservation. “First, the Plan will be incorporated into the Bethlehem Township Master Plan requiring all future developments in the township to be designed in a fashion that is consistent with the objectives of the Open Space Plan. Second, open space will be preserved through acquisition of specific properties...that are critical to the achievement of the goals of the Open Space Plan.”

The plan identifies twelve priority areas for acquisition including the establishment of a Musconetcong River Trail Greenway and restoration of the West Portal Brook stream corridor. The plan also contains the following goals for the protection of stream corridors where new development is proposed.

- Bethlehem Township shall establish 150-foot greenway on each side of trout production and maintenance streams.
- Where natural vegetation is lacking, the reforestation of these areas should be required as a condition of site plan approval.
- Areas within the 150 feet greenway shall be designated as conservation easements subject to passive public use at time of subdivision approval.
- Measures to protect conservation easements from post development disturbance shall also be required to the greatest possible extent as part of the subdivision approval.

Bloomsbury Borough

Approximately one half of the riverfront lands in the Borough are currently medium density residential or commercial uses. The east end of the Borough is zoned for Planned Urban Development (PUD). Development in this district allows a net density of three DU/acre for single-family units and 10 DU/acre for multi-family units. A minimum of 20 percent common open space is required. The master plan also indicates that the flood hazard area, and open space along the river should be included in this open space. A setback of 100 feet along streams is required by ordinance in residential districts. Development of the PUD zone can be compatible with protection of the resource values of the river corridor if the setbacks and open space provisions are implemented in the site design.

The remaining riverfront land is zoned agricultural conservation (AC) and agricultural residential (AR). The AC district includes 56 acres of state owned natural area and approximately five acres of municipal open space according to the NJ Highlands data. Unprotected lands within this zone allow a minimum five-acre lot, while the AR district requires a minimum three-acre lot. Both districts allow for a cluster option.

No sewer systems are present or planned within the Borough.

Greenwich Township

All riverfront lands in the township are zoned agricultural and open space preservation residential (R7). This district is designed to preserve prime agricultural soil and open space for recreation and conservation. This provides a sending zone for transfer of development rights to designated town centers. The minimum lot size is seven acres with options for open space communities, residential hamlets, and density bonus for preservation or rehabilitation of historic structures. To the right of Route 173 is a Research Office and Manufacturing zone which allows for 10-acre lots with a floor area ratio of .15. A new sewer treatment plant and discharge to the Musconetcong is proposed with the development of this manufacturing zone.

Environmentally sensitive areas in the R7 zone are to be protected by conservation easement. An environmental inventory included in the Master Plan Update (dated 1998) identified wetlands, floodplains and steep slopes in excess of 25 percent. A historic survey of the township was completed identifying historic or potentially historic sites in the area of Route 173 and

I-78 as well as along Route 173 within the river corridor. The Park, Recreation and Greenway Plan identifies the proposed greenway along the Musconetcong River. The master plan also includes a Historic Preservation Plan element and Community Design Guidelines.

There are presently no public or privately protected lands in the river corridor in Greenwich Township. Approximately 23 percent of the river corridor is wetland, wetland transition area or floodplain regulated by the state.

Franklin Township

Riverfront lands within the township are zoned primarily rural conservation (RC), with the exception of Asbury which is zoned village residential, and an area across from Bloombury Borough which is zoned industrial park (IP). The rural conservation district was designed to address the goals of protecting groundwater quality, scenic rural character, and promoting agricultural use. The RC district allows for one dwelling unit per five acres and provides options for lot averaging and clustering. Minimum buildable areas exclusive of steep slopes (> 25 percent), floodplains, karst features, and drainage or conservation easements must be met. These performance criteria do not apply to the IP zone.

The entire township is identified as a carbonate area and residential development capacity in the township is based on a nitrate dilution model. The Carbonate Area District ordinance requires special investigations and may impose special construction techniques. There is no sewer service existing or planned for the township, however public water service is planned for Asbury village and the IP district.

Objectives noted in the Land Use plan element of 1999 include: protect steep slopes; maintain and enhance groundwater and surface water quality; preserve prime agricultural soils; identify and manage stream corridor buffer areas; preserve the Morris Canal; adopt a stormwater management plan and preserve historic buildings. The Historic Plan Amendment adopted in March 2000 recommends that the Asbury Historic District should receive attention in the land development ordinances. A master plan re-examination is currently underway. An open space and recreation plan as well as a farmland preservation plan are also being prepared.

The township has land development ordinances related to the following features: Chapter 113 Soil Erosion and Sediment Control, follows the county guidelines and regulations are to be enforced by Warren County Soil Conservation District; Chapter 80 Flood Damage Prevention, requires a township permit for construction in the floodplain; Chapter 73 Farming, establishes a municipal farm preservation program. There are no specific natural features ordinances.

Approximately 15 percent of the river corridor is state or municipal lands. Preserved farms along Maple Avenue and east of Wolverton Road protect additional acreage of the river corridor. In addition, 26 percent of the corridor is wetland, wetland transition area or floodplain regulated by the state.

The historic village of Asbury is essentially built out and the majority of the

riverfront is zoned for low-density residential use. The township's requirement for dedication of right-of-way with subdivisions along the Morris Canal will provide for protection and future recreational use. The build out of the IP zone presents a potential threat to the river corridor. Development pressure in this area is currently low due to lack of suitable highway access, lack of water and sewer services, and slopes. One parcel in the IP is under consideration for farmland preservation.

Washington Township, Warren County

The 1994 draft master plan update included a conservation element, recreation plan and historic preservation plan. An environmental resource inventory was completed in 1991 and an open space inventory in 1992 by the environmental commission. Some objectives stated in the master plan included: retain rural atmosphere while allowing appropriate development and growth; protect historic resources; protect unique environmental features; provide adequate recreation facilities; new development should not adversely affect ground or surface water; and encourage farmland and open space preservation. Environmental constraints mapped include steep slopes, floodplains, wetlands, unsuitable soils, agricultural soils, sensitive geologic features, and scenic features. Scenic features are described as wooded hillsides, agricultural valleys and stream corridors. Stream corridors are also the focus of the conservation element. An overlay zone is recommended to provide a 150-foot buffer along streams. The buffer width is based on the goals of sediment control and nutrient removal. Residential development capacity in the township is based on a nitrate dilution model. Conservation easements are recommended for greenways. Historic structures within the river corridor include seven structures in Imlaydale hamlet, and three in Changewater. Zoning and buffering are recommended to protect historic resources. There is no public sewer or water service along the river currently. Expansion of sewer service was proposed in the 1994 master plan update within a proposed development boundary along Route 31. No zoning map or ordinances were available for review at the county planning board.

Mansfield Township

The land use along the river corridor in Mansfield Township is currently a mix of agricultural, residential and open space uses with high-density development centered in Beattystown and Port Murray. The township's master plan directs additional growth to lands surrounding Beattystown and Port Murray, particularly along the Route 57 corridor paralleling the river. Expansion of sewer and water service is planned for two areas along the river. These services would support the following proposed land uses along the river downstream of Beattystown: historic village commercial (HVC); adult retirement community; and business with senior housing option (B-1).

Between Port Murray and the river a sewer and water system is proposed along with village residential and golf course community developments. Between the growth centers of Beattystown and Port Murray recent acquisitions of open space will protect the area between the river and Route 57 from further development. To the right of Route 57 the existing agricultural land is planned for R-1 residential development. In addition to conventional three-acre lot subdivisions, the township allows for lot size averaging to encourage farmland preservation, cluster development with 30 percent open

space designation, and transfer of development credits to the village community zone. If implemented with the river corridor in mind, these options would allow for the permanent protection of lands adjacent to the river corridor.

Mansfield Township recommends preservation of stream corridors and the establishment of a greenway and trail system along the Musconetcong in the open space element of their master plan.

Pohatcong Township

The goals and objectives of the township Master Plan include preserving remaining open and forested land, natural features and farms and the preservation and enhancement of existing stream corridors. An environmental resource inventory identifies wetlands, topography, depth to seasonal high water, soils, geology and critical geologic areas. A Farmland Preservation Plan element was adopted in 1999. Within the Musconetcong watershed this plan identifies two agricultural development areas (ADA), Silver Hills and Valley & Ridge. The plan indicates that 673 acres of farmland are slated for preservation in the Silver Hills ADA and 2022 acres in the Ridge & Valley ADA. One farm is currently preserved along the river corridor immediately upstream from Warren Glen. The township open space and farmland trust fund was increased in November 1999 from .02 per \$100 assessed property to .05 per \$100.






The villages of Warren Glen, Finesville, Siegetown, Rieglesville and Mt Joy are zoned as residential high-density villages (R4V). Limited areas in the river corridor adjacent to Warren Glen are zoned neighborhood business and industrial. All remaining riverfront in the township is zoned residential rural (R1 and R2). These districts allow densities of 0.2 and 0.5, respectively. There is no sewer service within the watershed currently and no plans for expansion to this area. Warren Glen and Rieglesville have public water service from Garden State Water Company. There are no plans for expansion of this service.

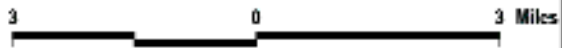
Holland Township

Riverfront land uses in the township include industrial and low density residential. The Musconetcong Gorge Nature Preserve, part of the Hunterdon County park system, parallels the river for approximately three miles. The residential district along the river is zoned for five-acre lots and allows for three-acre lots with lot averaging or cluster options. This district was recently rezoned from R3 to reduce the density based on the objectives of preserving agriculture and the physical and environmental limitations throughout the district including steep slopes, adverse soil and bedrock conditions, septic disposal limitations and limited groundwater yield. The area of Rieglesville is zoned village residential (VR) and designed to promote retention of existing buildings and preserve the historic character of the village. There are no sewer systems or plans for expansion into the river corridor.

MUSCONETCONG RIVER
National Wild & Scenic Rivers Study

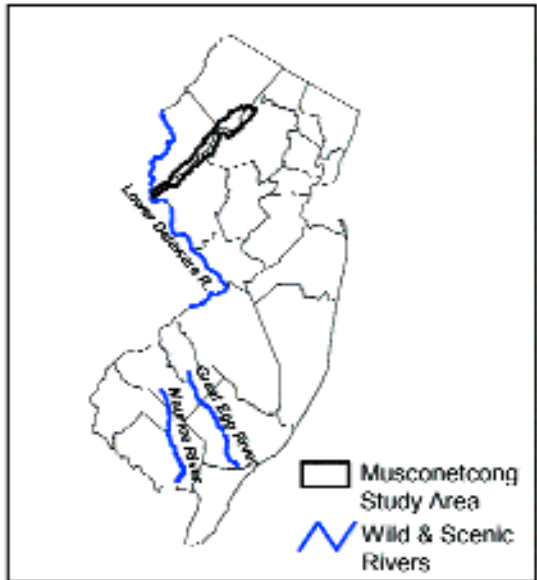
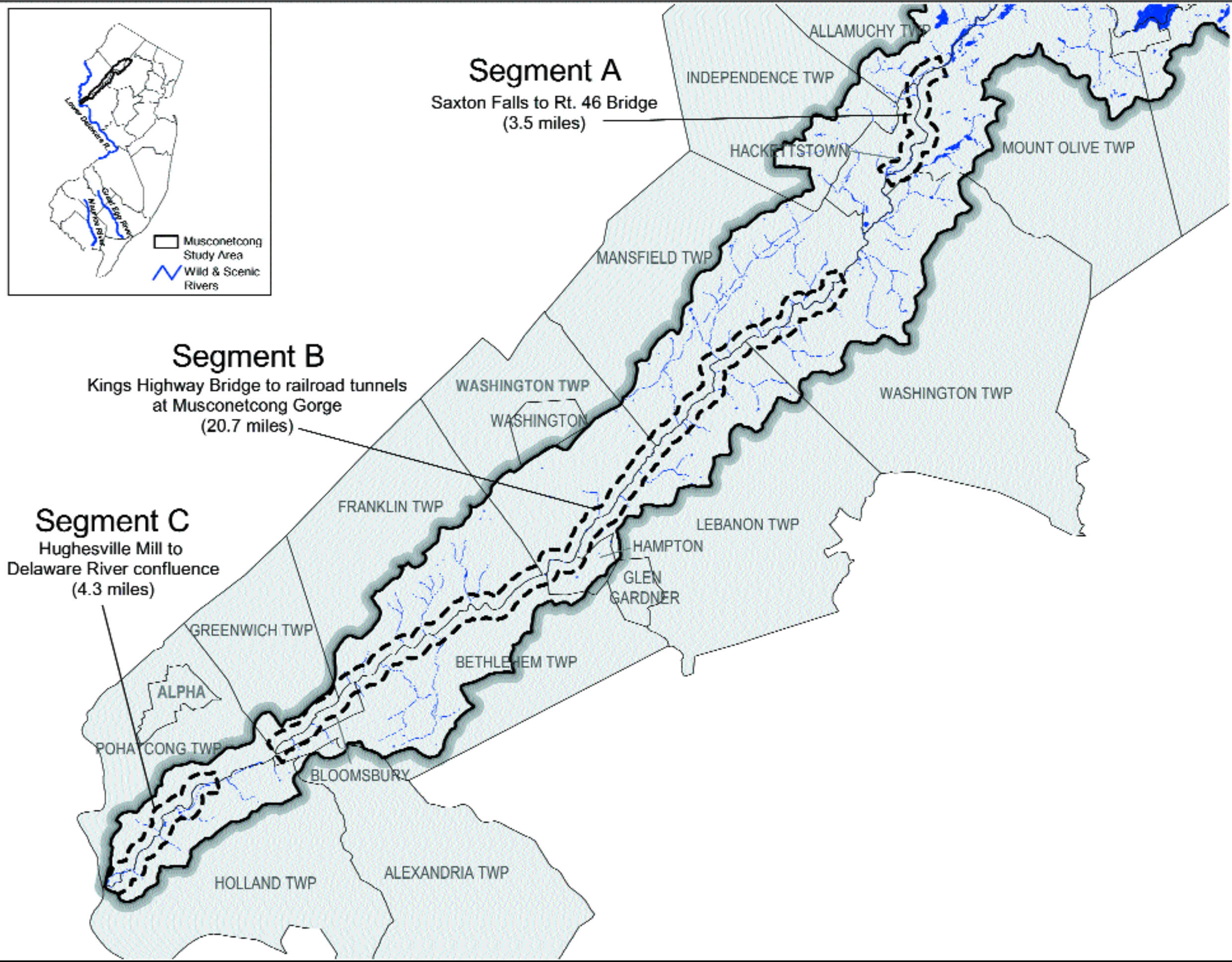
Eligible River Segments

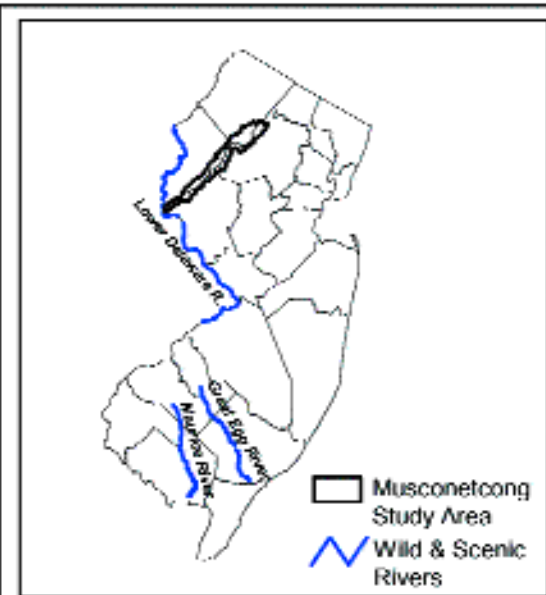
-  Eligible Segment
-  Watershed Boundary
-  Municipal Boundary
-  Open Water
-  Streams



Data Source
NJ Department of Environmental Protection
Heritage Conservancy

The map was developed using New Jersey Department of Environmental Protection data. The map is not a representation of any data, and it is not intended to be used for any purpose other than that for which it was developed. The map is not a representation of any data, and it is not intended to be used for any purpose other than that for which it was developed. The map is not a representation of any data, and it is not intended to be used for any purpose other than that for which it was developed.





MUSCONETCONG RIVER

National Wild & Scenic Rivers Study

Open Space & Recreation Lands

- Public Open Space (NJDEP 1999)
- Private Open Space & Preserved Farmland (NJDEP 1999, Hunterdon County 2002, North Jersey RC&D 2002)
- River Access Points (Public)
- Eligible National Wild & Scenic Rivers System Boundary
- Watershed Boundary

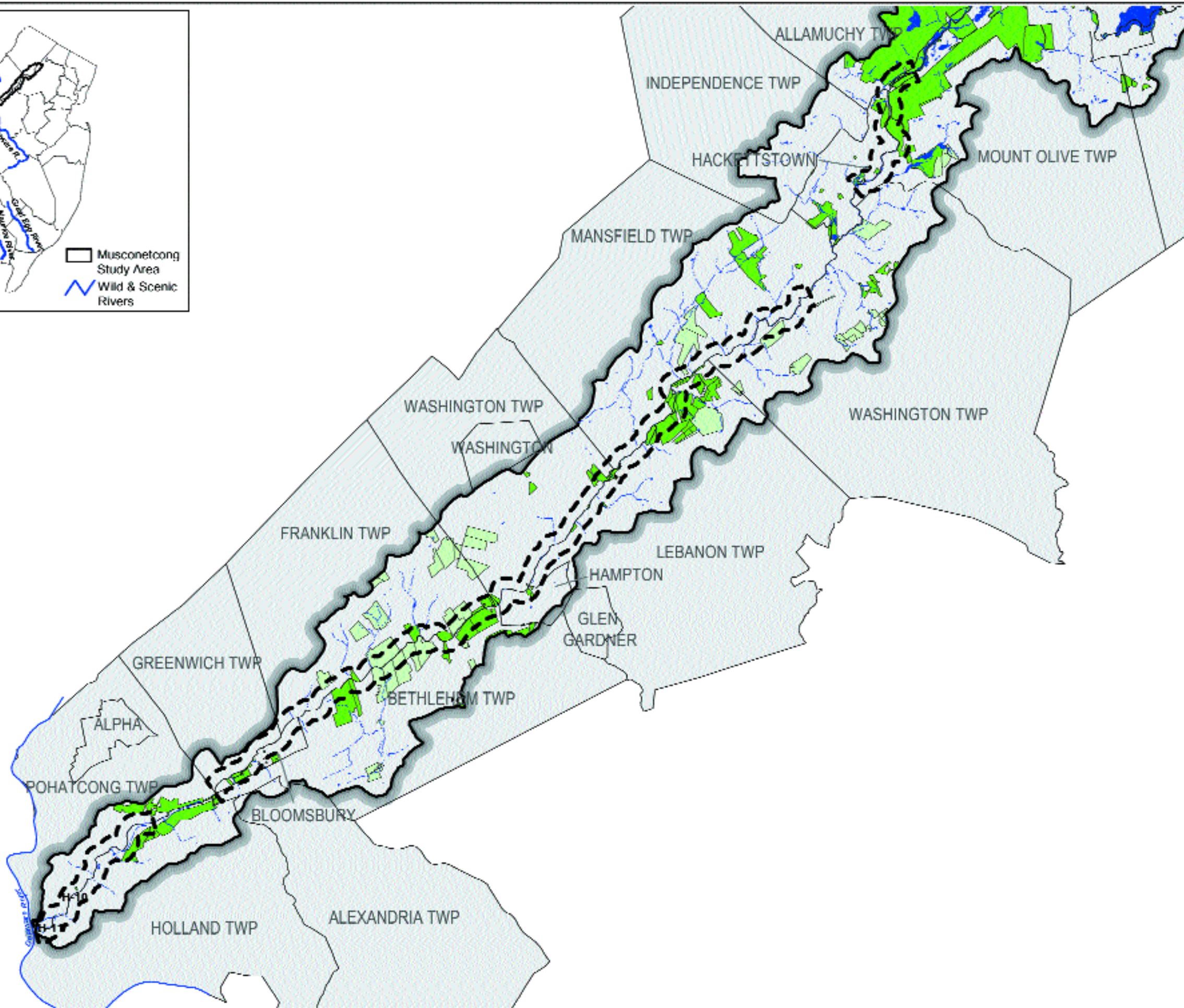


Data Source

NJ Department of Environmental Protection
Heritage Conservancy

This map was developed using New Jersey Department of Environmental Protection data. While every effort was made to ensure accuracy, the user assumes all responsibility for any errors or omissions. This map and its contents are not to be used for any purpose other than that for which it was prepared and is not to be construed as a warranty or guarantee of any kind.

The information conveyed in this map is provided in outline only and is not intended to be used as a legal document. The user shall hold Heritage Conservancy harmless from any liability, claims or actions arising out of the use of this map or accompanying information.



MUSCONETCONG RIVER

National Wild & Scenic Rivers Study

Historic & Scenic Resources

- ★ Historic Sites
- Historic Districts
- ▲ Scenic Vista

- Eligible National Wild & Scenic Rivers System Boundary
- Watershed Boundary



0 3 Miles

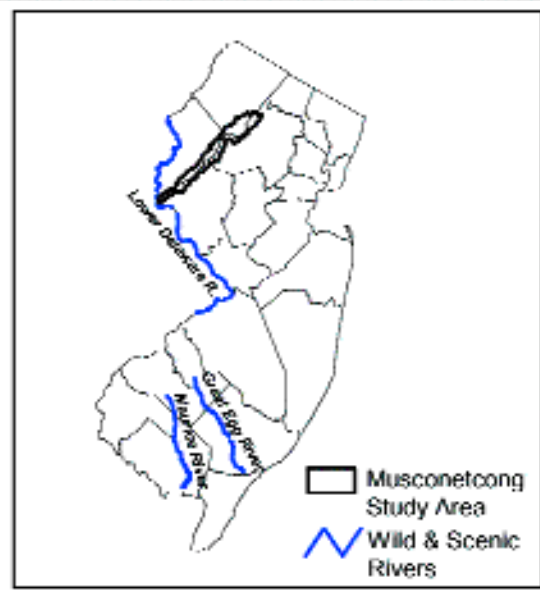
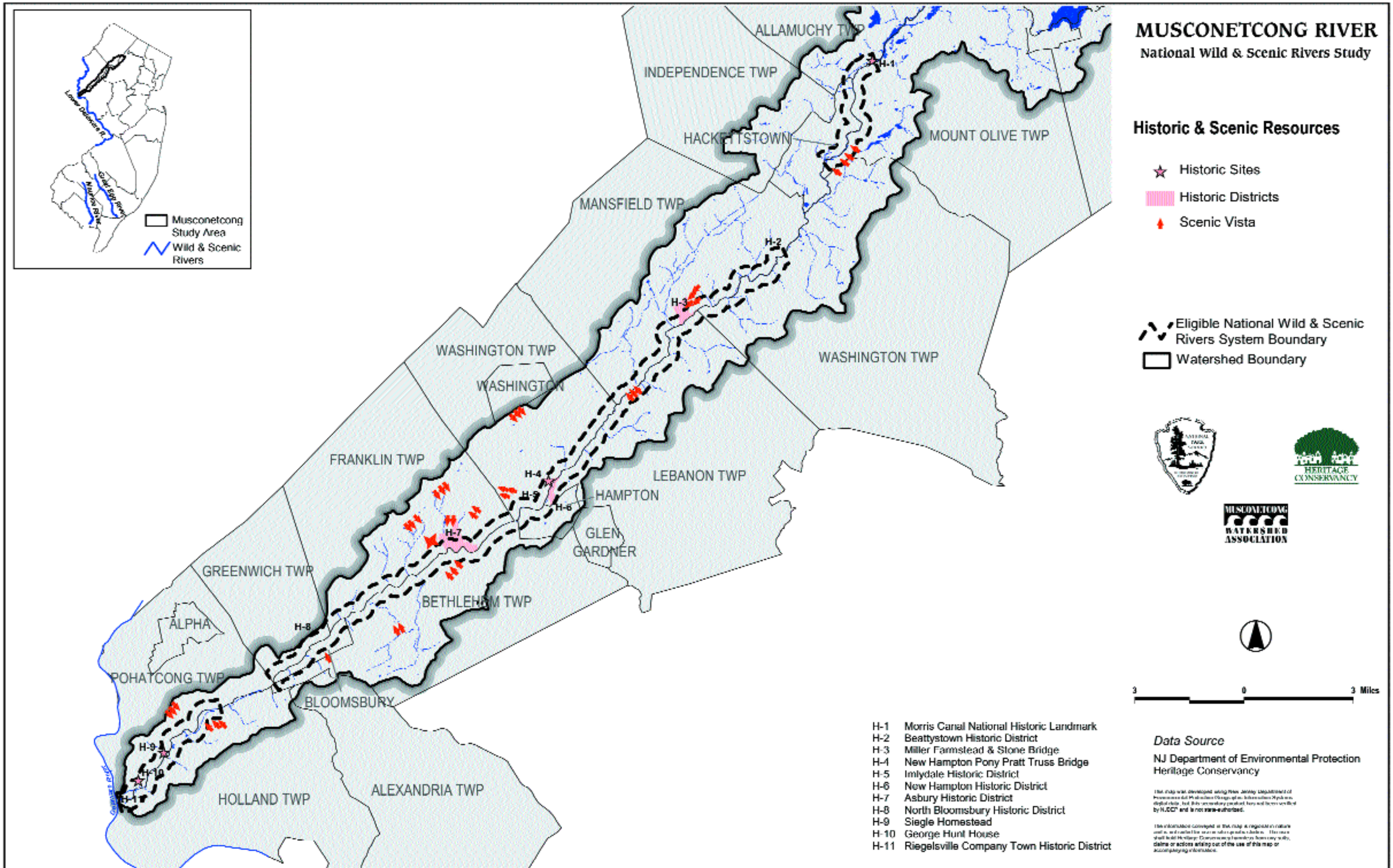
Data Source

NJ Department of Environmental Protection
Heritage Conservancy

This map was developed using files jointly developed by the NJ Department of Environmental Protection and the Heritage Conservancy. It is a digital file. All data necessary to produce this map were provided by the NJ Department of Environmental Protection and the Heritage Conservancy and are not to be used for any other purpose without their written consent.

The information conveyed in this map is for informational purposes only and does not constitute a warranty. The user shall hold the Heritage Conservancy harmless from any liability, claims or actions arising out of the use of this map or accompanying information.

- H-1 Morris Canal National Historic Landmark
- H-2 Beattystown Historic District
- H-3 Miller Farmstead & Stone Bridge
- H-4 New Hampton Pony Pratt Truss Bridge
- H-5 Imlydale Historic District
- H-6 New Hampton Historic District
- H-7 Asbury Historic District
- H-8 North Bloomsbury Historic District
- H-9 Siegle Homestead
- H-10 George Hunt House
- H-11 Riegelsville Company Town Historic District










MUSCONETCONG RIVER


National Wild & Scenic Rivers Study


New Jersey State Plan Policy Map

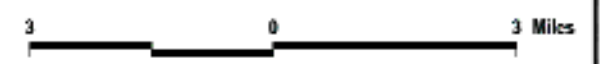
Planning Areas

-  Suburban Planning Area (PA2)
-  Rural Planning Area (PA4)
-  Rural Environmentally Sensitive Planning Area (PA4B)
-  Environmentally Sensitive Planning Area (PA5)
-  Park as delineated in Plan Cross Acceptance
-  Park from NJDEP State Open Space 1998
-  Water

(NJ DCA - Office of Smart Growth 2001)

 Eligible National Wild & Scenic Rivers System Boundary

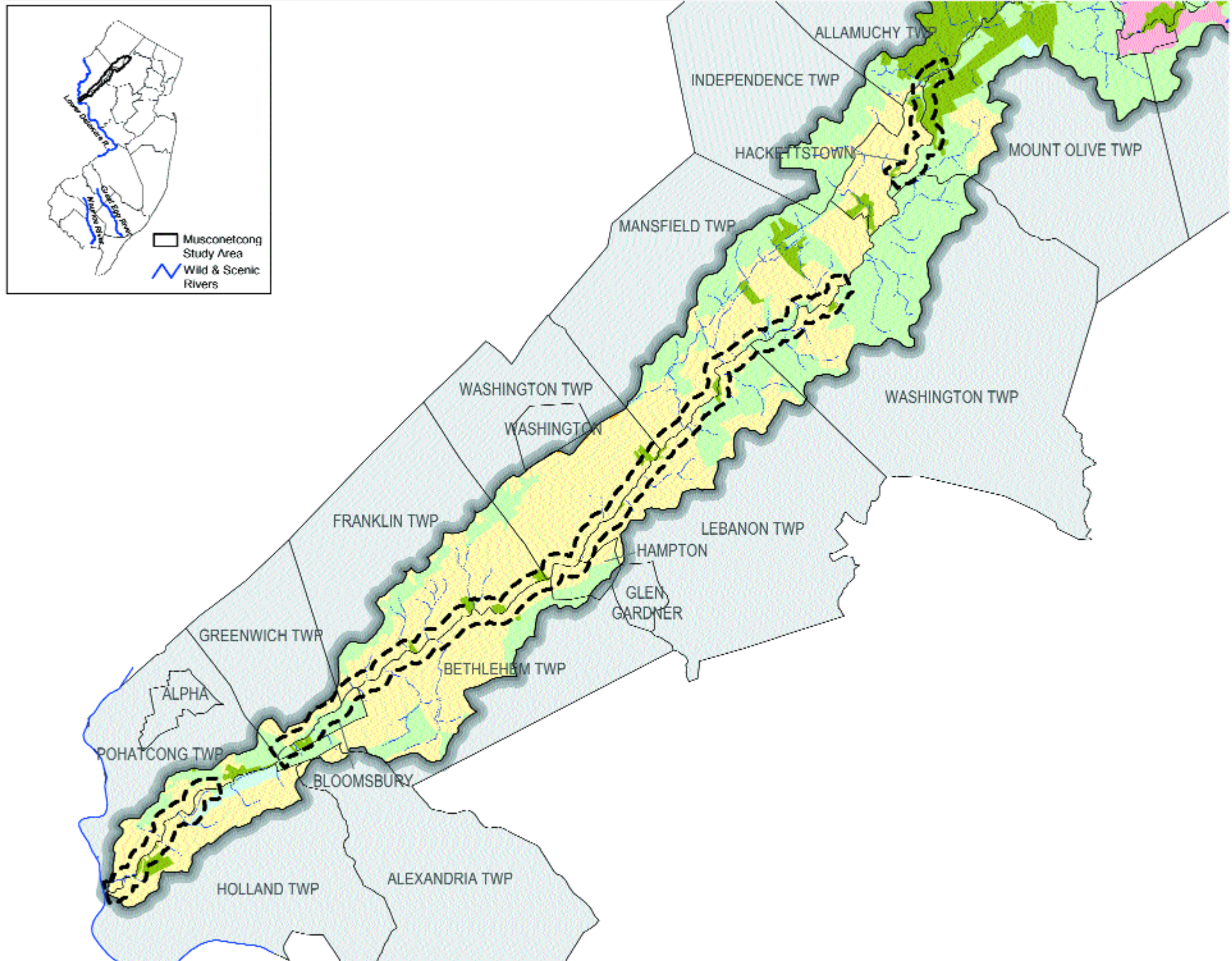
 Watershed Boundary



Data Source
NJ Department of Environmental Protection
Heritage Conservancy

This map was developed using New Jersey Department of Environmental Protection data. It is not intended to be used for any other purpose. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or by any information storage and retrieval system, without the prior written permission of the NJ Department of Environmental Protection.

The information conveyed in this map is for informational purposes only and does not constitute a warranty. The user shall hold the Heritage Conservancy harmless from any liability, claims or actions arising out of the use of this map or accompanying information.





MUSCONETCONG RIVER

National Wild & Scenic Rivers Study

Land Use/Land Cover

-  AGRICULTURE
 -  BARREN LAND
 -  FOREST
 -  URBAN
 -  WATER
 -  WETLANDS
- (NJDEP 1995/1997)

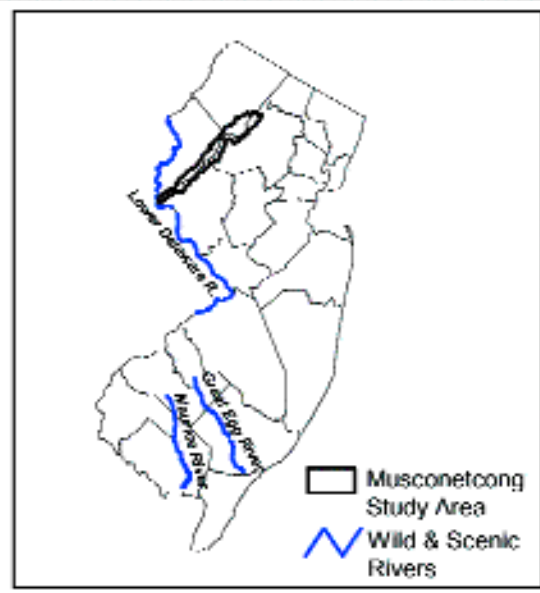
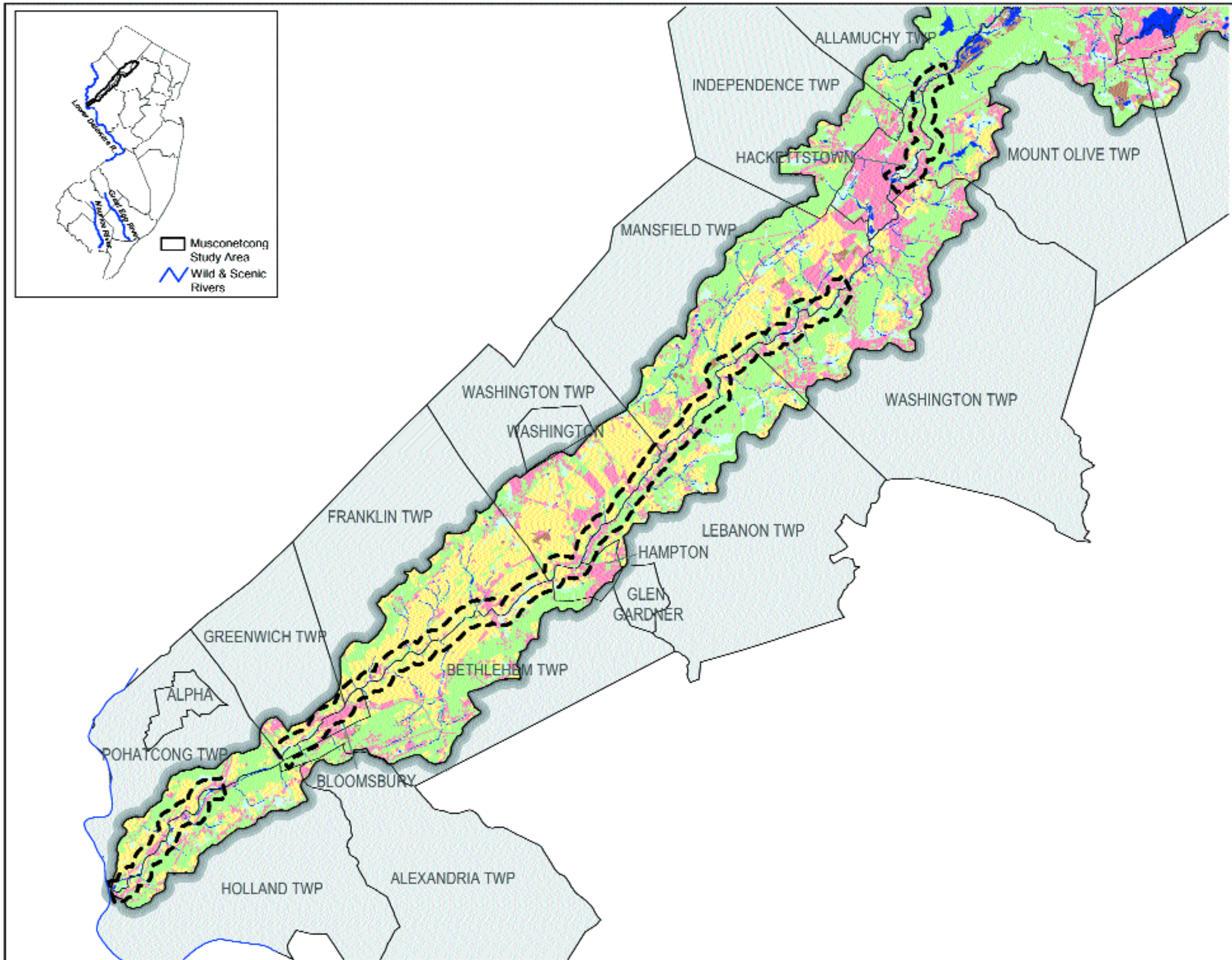
-  Eligible National Wild & Scenic Rivers System Boundary
-  Watershed Boundary



Data Source
 NJ Department of Environmental Protection
 Heritage Conservancy

This map was developed using files jointly developed by the NJ Department of Environmental Protection and the Heritage Conservancy. It is a digital file. All data are the property of the NJ Department of Environmental Protection and the Heritage Conservancy. No warranty is made by NJDEP and is not authorized.

This information conveyed on this map is for informational purposes only and is not intended to be used as a basis for any legal action. The user shall hold the Heritage Conservancy harmless from any liability, claims or actions arising out of the use of this map or accompanying information.



MUSCONETCONG RIVER

National Wild & Scenic Rivers Study

Important Habitats & Natural Areas

- Forest Boundary
 - Wild Trout Stream
 - Trout Maintenance Stream
 - Trout Production Stream
 - Natural Heritage Site
- Grassland**
- Suitable Habitat
 - State Threatened Species
 - State Endangered Species
 - Federally Listed Species
 - No Data
- Emergent**
- Suitable Habitat
 - Non-Listed Priority Species
 - State Threatened Species
 - State Endangered Species
 - Federally Listed Species
 - No Data
- Forested Wetland**
- Suitable Habitat
 - Non-Listed Species
 - State Threatened Species
 - State Endangered Species
 - Federally Listed Species
 - No Data
- Forest**
- Suitable Habitat
 - Non-Listed Priority Species
 - State Threatened Species
 - State Endangered Species
 - Federally Listed Species
 - No Data

(NJDEP 1999)



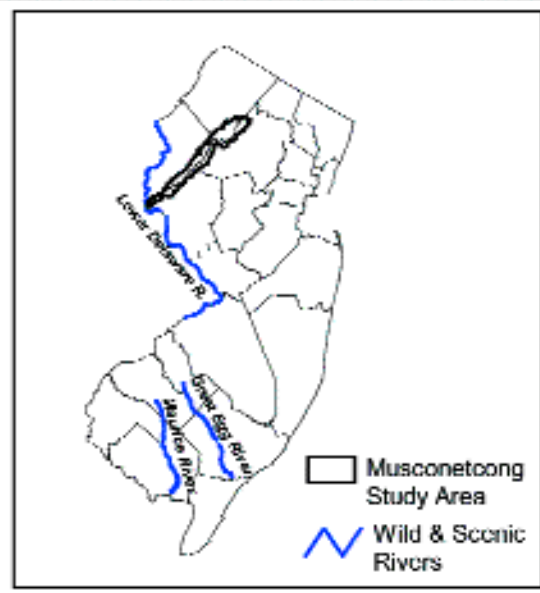
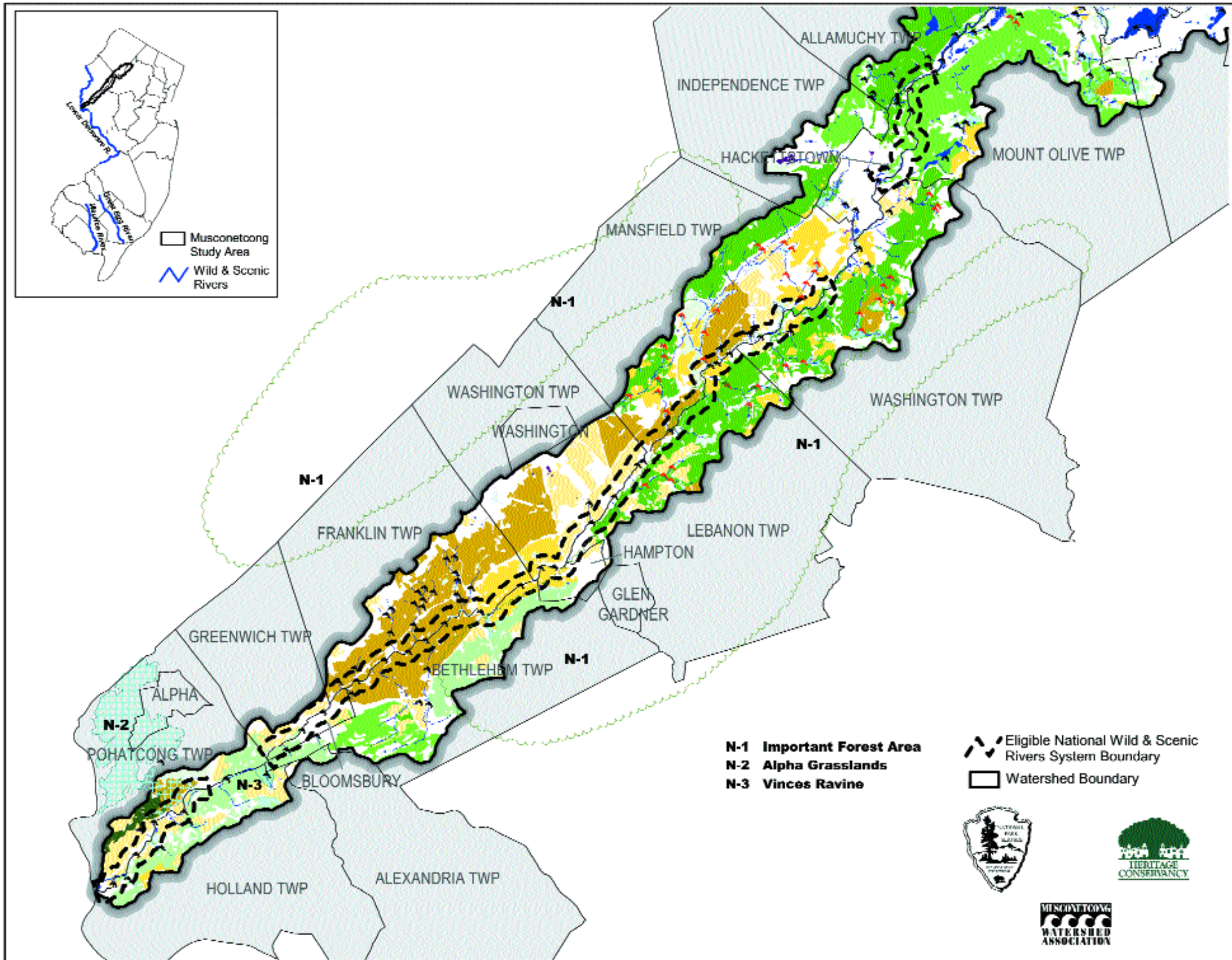
Data Source
 NJ Department of Environmental Protection
 Heritage Conservancy

This map was developed using New Jersey Department of Environmental Protection's data as of 1999. The data is not intended to be used for any other purpose. The map is not a warranty, and the user assumes all liability for any use of this map or accompanying information.



- N-1 Important Forest Area**
- N-2 Alpha Grasslands**
- N-3 Vincennes Ravine**

- Eligible National Wild & Scenic Rivers System Boundary
- Watershed Boundary



- Musconetcong Study Area
- Wild & Scenic Rivers



Musconetcong Watershed Association
P.O. Box 113
Asbury, NJ 08802
www.musconetcong.org



Heritage Conservancy
85 Old Dublin Pike
Doylestown, PA 18901
www.heritageconservancy.org



National Park Service
Stewardship & Partnership Program
200 Chestnut Street, 3rd Floor
Philadelphia, PA 19106
www.nps.gov
