



FARMINGTON WILD AND SCENIC RIVER STUDY

Draft Eligibility and Classification Report

August, 1989

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I. INTRODUCTION

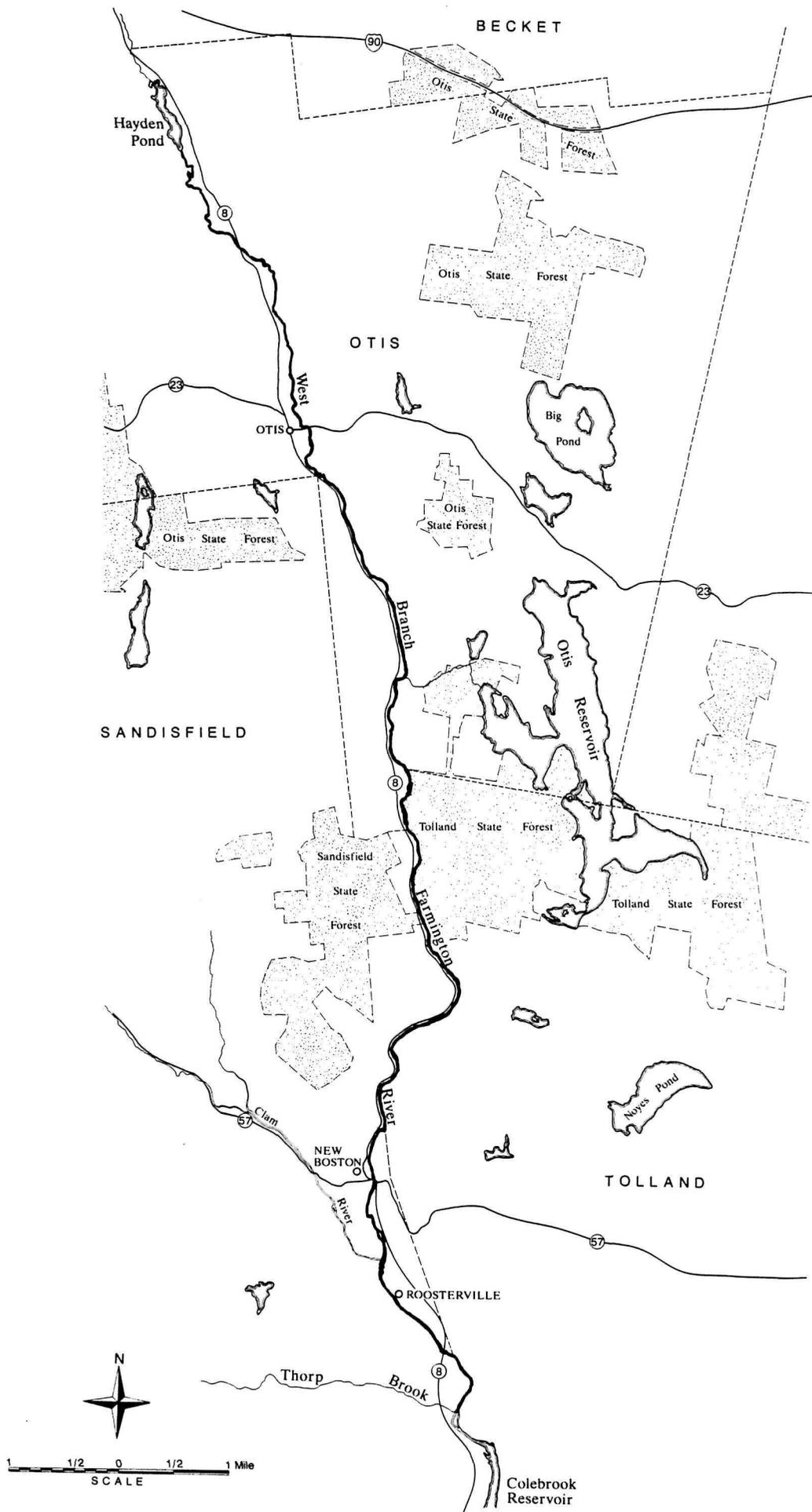
In October, 1986, federal legislation (P.L. 99-590) was signed into law authorizing the study of two segments of the West Branch of the Farmington River as potential additions to the National Wild and Scenic Rivers System. The study will assess the eligibility and the suitability of the segments for inclusion in the system and will propose alternatives for river conservation. The National Park Service, North Atlantic Region, has been the lead agency for the study, with assistance from the Farmington River Study Committee, which includes representatives from state and local governments, the Farmington River Watershed Association, the Metropolitan District Commission and area residents. Staff from the Mid-Atlantic Region of the National Park Service prepared the following report, which is the first phase of the study.

The purpose of this report is twofold: first, to determine whether the segments are eligible for inclusion in the national system by examining the river related resources of the study segments; and second, upon determination of eligibility, to identify appropriate classifications for the segments if they are to be designated. This report makes no recommendation as to whether the eligible river segments should be placed in the national system, but rather, establishes the segments' eligibility for inclusion if designation is pursued in the future. The decision of whether or not to pursue designation rests with those individuals, local and state governments, and organizations with an interest in the Farmington River.

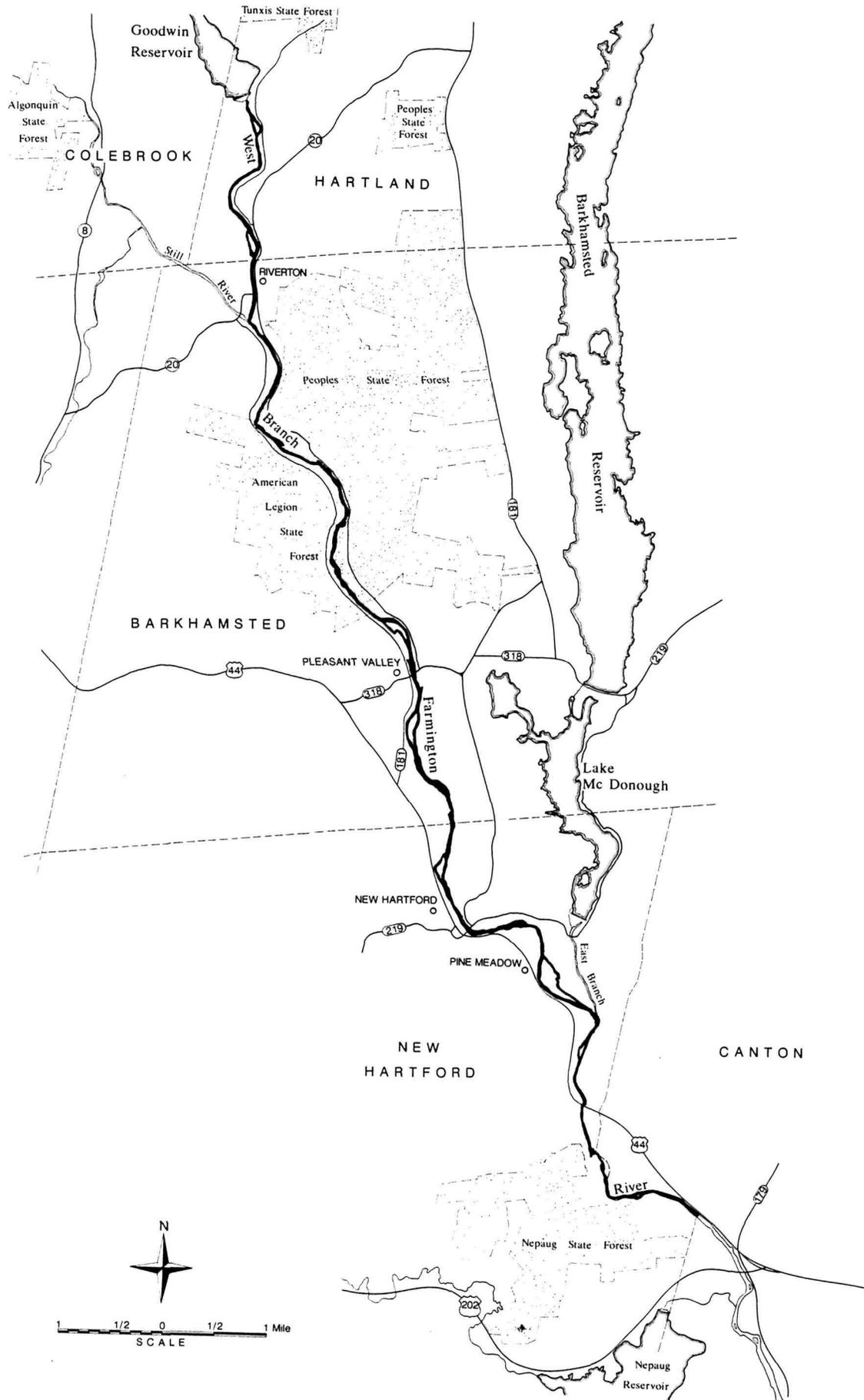
The enabling legislation authorized the following segments to be studied (Maps 1 and 2):

A. The segment from the confluence with Thorp Brook in Sandisfield, Massachusetts, to Hayden Pond in Otis, Massachusetts (referred to in this report as the Massachusetts Study Segment).

B. The segment from the intersection of the New Hartford-Canton, Connecticut, town line upstream to the base of the West Branch Reservoir in Hartland, Connecticut (referred to in this report as the Connecticut Study Segment).



FARMINGTON RIVER - MASSACHUSETTS STUDY SEGMENT



FARMINGTON RIVER - CONN. STUDY SEGMENT - OUTSTANDING RESOURCE MAP

II. THE NATIONAL WILD AND SCENIC RIVERS SYSTEM

A. The Wild and Scenic Rivers Act

The 1968 Wild and Scenic Rivers Act¹ established a framework to protect the nation's outstanding, free-flowing rivers for the benefit and enjoyment of present and future generations. In passing the Act, Congress declared that the established policy of building dams, levees, and other river construction needed to be complemented by a policy to preserve selected rivers, or river segments, in their free-flowing condition. These selected rivers collectively form the National Wild and Scenic Rivers System.

Eight rivers were designated immediately as part of the System. The Act also included provisions for adding rivers to the System and set minimum criteria for their eligibility. To be eligible, a river or river segment must:

1. Be free-flowing.
2. Be adjacent to or within a related land area which possesses one or more outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.
3. Be relatively undeveloped. The level of development along eligible rivers may range from largely undeveloped, essentially primitive areas to segments developed for agricultural uses, and may include some residential, commercial or similar development.

B. The Nationwide Rivers Inventory

From 1976 to 1982, the Department of the Interior conducted a systematic, nationwide inventory and evaluation of undeveloped, free-flowing rivers and their adjacent lands. The purpose of The Nationwide Rivers Inventory (NRI) was to determine which rivers or river segments appeared to meet the minimum

criteria for further study and/or potential inclusion into the National Wild and Scenic Rivers System. Published in 1982, the NRI included the following three segments of the Farmington River, which were recognized for their recreational, fishery, and geological values:

<u>NAME</u>	<u>SEGMENT DESCRIPTION</u>	<u>MILEAGE</u>
Farmington River	Second Brook to north of Old Farms Road (CT)	6
West Branch of the Farmington River	above New Hartford to the West Branch Reservoir (CT)	7
West Branch of the Farmington river	from its confluence with Thorp Brook to Hayden Pond (MA)	11

Recognition of these segments of the Farmington River on the NRI allowed the Farmington River Watershed Association, a group with long-standing interest in the conservation of these areas, to request technical assistance from the National Park Service under the auspices of section 11 of the National Wild and Scenic Rivers Act².

The Wild and Scenic Rivers Act authorizes the National Park Service to assist state and local governments, private organizations, landowners and other individuals to plan, protect and manage river resources. The National Park Service's State and Local River Conservation Assistance Program has

given priority to providing conservation technical assistance on projects that:

- 1) are locally supported, politically feasible cooperative efforts;
- 2) include rivers listed on the NRI or other areas of national importance; and,
- 3) are complex enough to warrant federal involvement.

Because the Farmington River meets all three of these criteria, the National Park Service has assisted with ongoing conservation planning efforts. In 1982, a preliminary study was conducted to assess the significant natural, cultural, and recreational resources in the area, investigate the attitudes and concerns of local residents and government officials, and identify alternative strategies for the management and conservation of the Farmington River corridor. The study found that the Farmington River possesses unique, nationally significant resources, and that both local residents and government officials recognize the value of these river-related resources and are concerned about conserving the quality of the river for the future. The principal recommendation set forth in this initial study was that the local governments and interested private organizations should develop a management plan to:

“establish a regional cooperative partnership between all levels of government and private groups and individuals to develop explicit and integrated policies for the future use and management of the Farmington River corridor.”³

As a result of this study, and a growing interest in adding federal protection to state and local efforts to conserve the area’s most significant resources, in 1986 Congress directed that studies should be conducted to evaluate the potential addition of two segments on the Farmington River to the National Wild and Scenic Rivers System⁴. This report is an initial step in the congressional study process, evaluating the eligibility of these segments for inclusion in the National Wild and Scenic Rivers System.

C. The Eligibility Study Process

The Wild and Scenic Rivers Act⁵ and the “Final Revised Guidelines for Eligibility, Classification, and Management of River Areas”⁶ describe the criteria and set the procedure for determining the eligibility and classification of river areas for inclusion in the National Wild and Scenic River system.

1. Eligibility for the study segments of the West branch of the Farmington were determined by using the following process:

- a. The study segments were examined to determine whether they are **free-flowing** (free of impoundments). Although the two study segments are separated by the connected impoundments of the Colebrook and Hogback Reservoirs, a previous determination has been made that these portions of the river are free-flowing and that this condition does not preclude eligibility.⁷
- b. Each study segment was examined to determine whether **outstandingly remarkable resource values** are present within the river or adjacent river-related lands. An outstandingly remarkable resource value is defined as a scenic, recreational, geologic, fish and wildlife, historical, cultural, or other similar value which is of multi-state or national significance. A river segment is found to be eligible if at least one significant resource value can be documented. Federal, State, and local agencies, private conservation organizations, local colleges, and individual resource experts were contacted for relevant literature and information relating to the West Branch of the Farmington and its resources.

c. The study segments were examined to determine the **level of existing development** within the river corridor. In the "Final Revised Guidelines for Eligibility, Classification, and Management of River Areas", the corridor is defined as that area within one-quarter mile of the banks of each side of the river⁸. In 1980, using a system developed for the Nationwide Rivers Inventory⁹, a Development Point Index value was calculated for each mile of the NRI segments and then averaged by the total number of miles in the segment. US Geological Survey topographic maps and aerial photographs of the river, supplemented by field checks, were used to determine existing levels of development. Field checks in 1988 verified that no development exists within the study segments that would make the river ineligible for inclusion in the National Wild and Scenic Rivers System.

2. As an aid to formulating a draft management plan for the river and its corridor, study segments which are found to be eligible according to the above criteria are then assigned preliminary classifications as either "wild river areas," "scenic river areas," or "recreational river areas." Classifications are based on existing development within the river corridor, accessibility, and water quality.

a. Wild river areas. 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.

b. Scenic river areas. 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 road.

c. Recreational river areas. Those rivers or sections 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.¹⁰

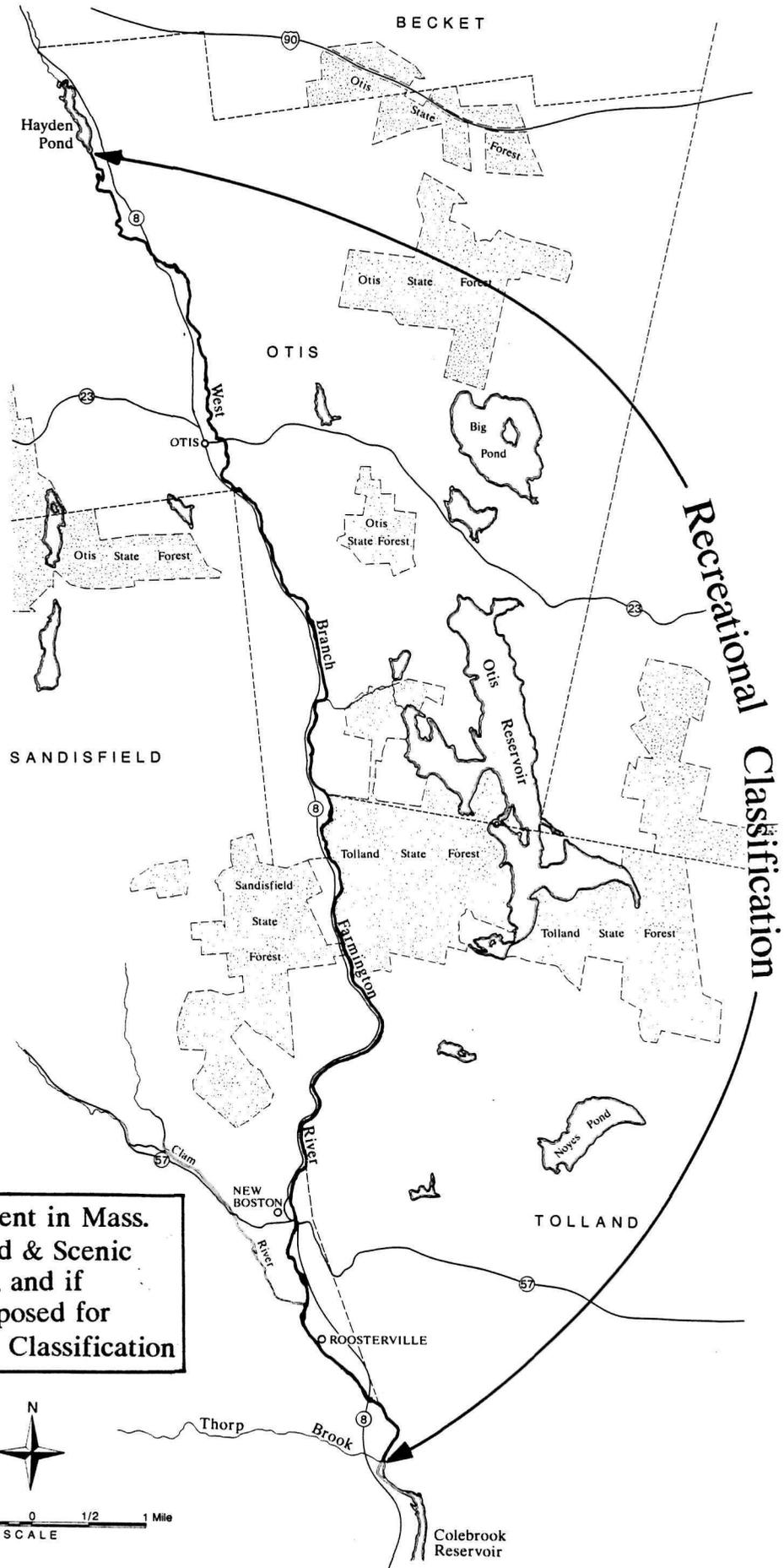
III. MAJOR FINDINGS

A. Eligible Segments and Proposed Classifications

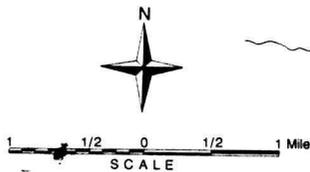
The resource assessment completed as part of this study demonstrates that both study segments of the West Branch of the Farmington River are eligible for inclusion in the National Wild and Scenic River System (Maps 3 and 4). The segments, and their recommended classifications are:

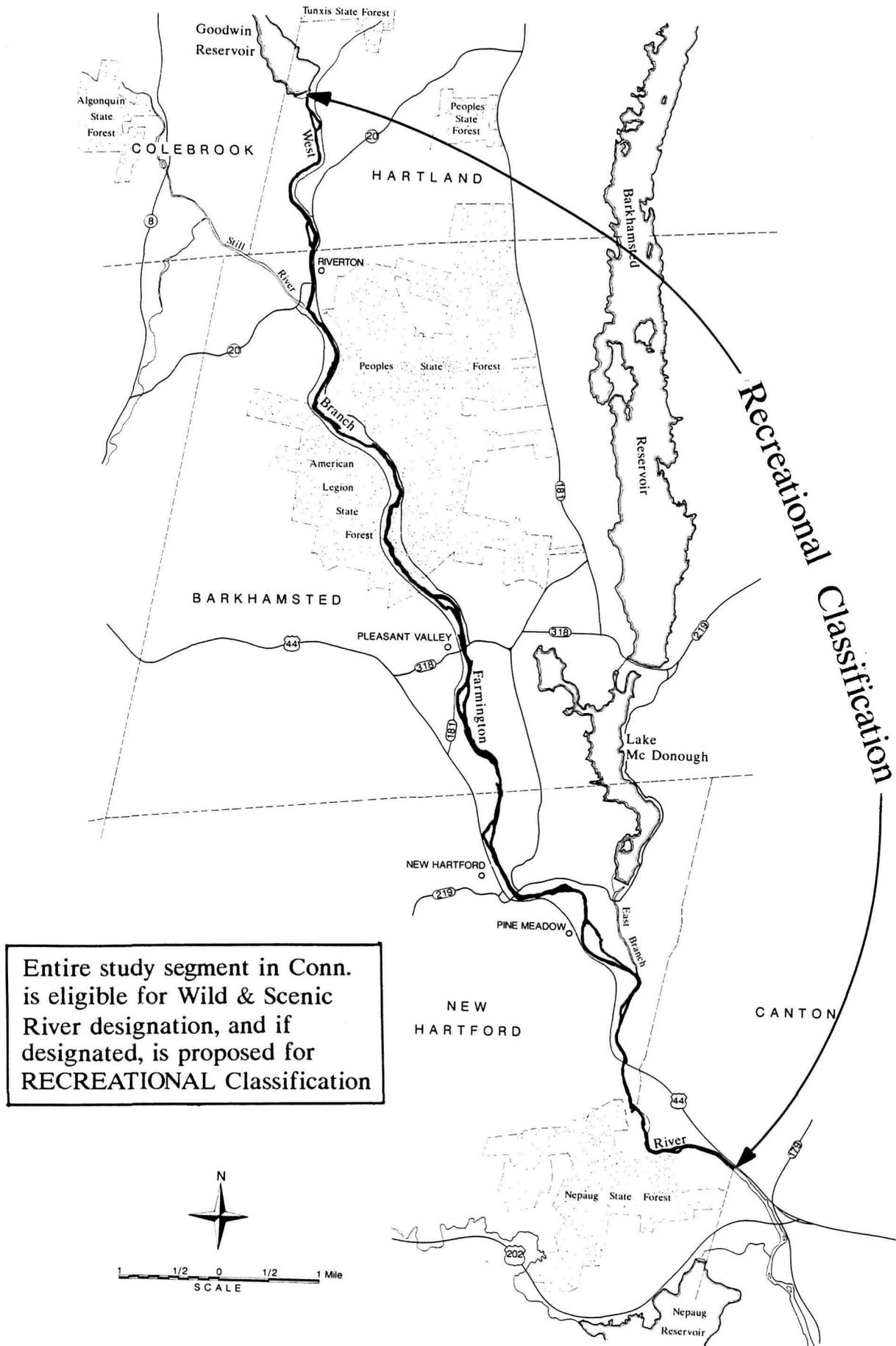
SEGMENT	SEGMENT DESCRIPTION	CLASSIFICATION	MILEAGE
Massachusetts Study Segment	from the confluence with Thorp Brook in Sandisfield, MA, upstream to Hayden Pond in Otis, MA	recreational	11
Connecticut Study Segment	from the downstream limit of the intersection with the New Hartford-Canton, CT town line* upstream to the base of the West Branch Reservoir in Hartland, CT	recreational	14

* The Farmington River Study Committee has passed a unanimous resolution requesting that the lower limit of the Connecticut Study Segment be defined as **the downstream limit of the New Hartford-Canton town line intersection**.



Entire study segment in Mass. is eligible for Wild & Scenic River designation, and if designated, is proposed for RECREATIONAL Classification





FARMINGTON RIVER - CONNECTICUT STUDY SEGMENT - CLASSIFICATION MAP

B. Basis for Finding of Eligibility and Classification

A river or river segment is eligible for inclusion in the National Wild and Scenic River System if it is free-flowing, relatively undeveloped, and possesses at least one outstandingly remarkable natural, scenic, cultural, or recreational value.¹¹

1. The two study segments of the West Branch of the Farmington River are **free-flowing**, free of impoundments, diversions, and major shoreline modifications.
2. The range, types and levels of development along the Farmington are consistent with guidelines for wild and scenic eligibility.

a. Massachusetts Study Segment

The Massachusetts Study Segment is largely undeveloped. Much of the watershed is in a relatively undisturbed, forested condition. The small communities along the river lend a rural, historic character to sections of the river corridor. The limited level of development throughout the segment is in keeping with the proposed recreational designation.

b. Connecticut Study Segment

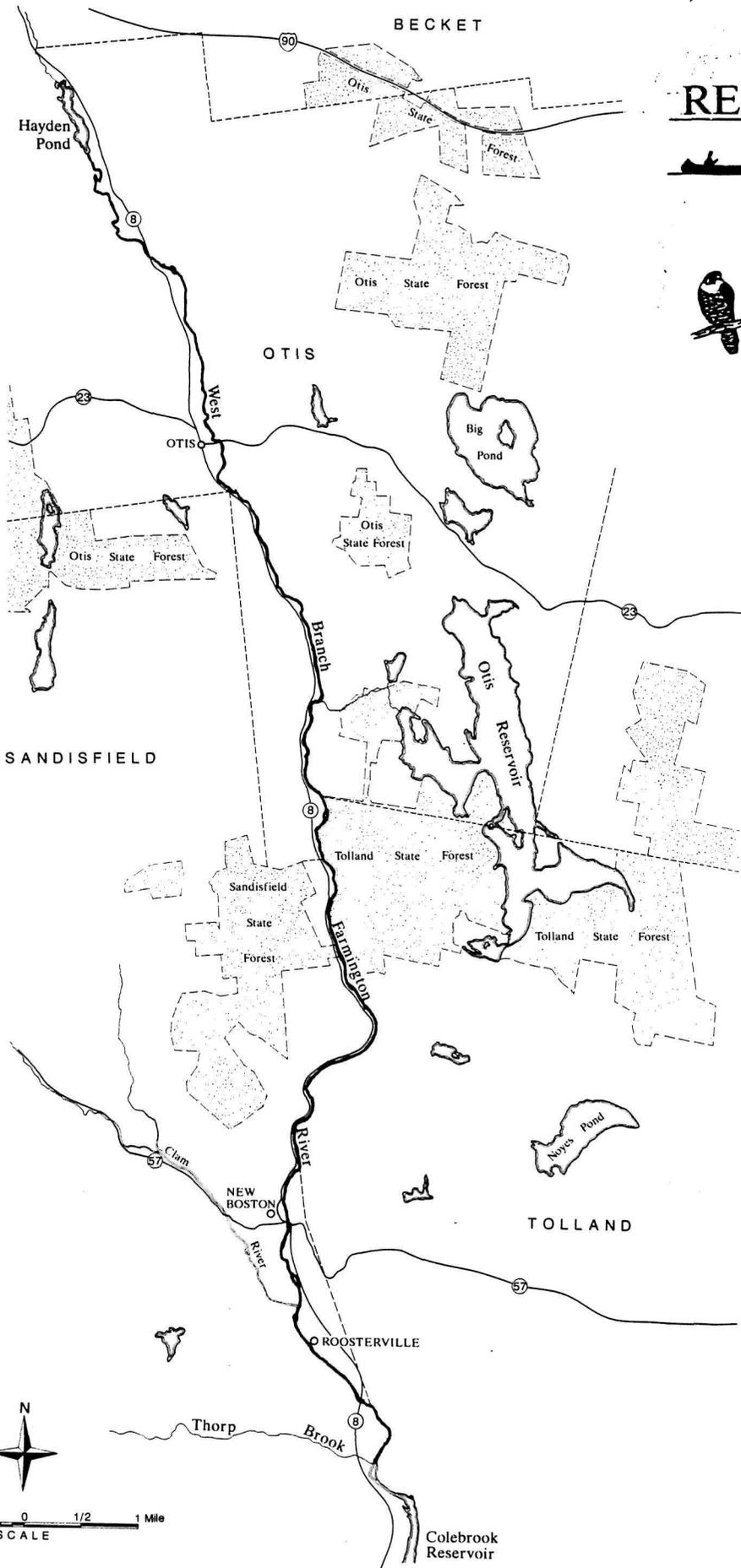
The Connecticut Study Segment includes three small communities, the largest being the historic town of New Hartford. In all cases, the riverfront communities' character, low-level development and historic and recreational resources are in keeping with the essentially rural character of the river corridor evident throughout the segment. As required by the federal guidelines, the entire waterway "remains generally natural and riverine in appearance."¹² In addition, for management purposes, it is appropriate that the inter-related outstanding riverine resources found throughout the Connecticut Study Segment be regarded as a single contiguous unit.

3. The study segments possess several **outstandingly remarkable values** of multi-state and national significance (Maps 5 and 6):

a. **Massachusetts Study Segment**

1) Recreation: This segment of the Farmington River is treasured by expert boaters as some of the region's finest white water.¹³ The upper half of the segment, from Otis to below Cold Spring, is relatively small and slow-moving, with a few class 2 rapids suitable for non-technical boaters. In contrast, the 3-4 mile section from below Cold Spring to New Boston is almost entirely class 3-4 water (difficult, with drops and waves to 4 feet). Published river guides for the area indicate that fewer than 20 similar high order whitewater sites exist in Connecticut and Massachusetts.^{14,15} The Appalachian Mountain Club holds annual competitions on the river with over 150 participants, and the area has been proposed as one of the few sites in the United States suitable for international competitions. Although this portion of the river is generally only runnable in the spring or following heavy rainfall, the controlled release of water from the upstream Otis Reservoir allows canoeing on scheduled fall weekends, a time when nearly all other white water rivers in the region are impassable. These scheduled release days regularly attract hundreds of boaters.

2) Wildlife: The Massachusetts Division of Fisheries and Wildlife's Natural Heritage and Endangered Species Program has identified the presence of an historic peregrine falcon aerie within the study corridor. Ongoing efforts to spur the recovery of the peregrine falcon, a federally endangered species, have to date resulted in the establishment of breeding pairs in Boston and Springfield, Massachusetts. The historical aerie, overlooking the Farmington River, is regarded as the best natural cliff site in Massachusetts for reoccupation by returning wild peregrines. Protection of the site is considered to be "extremely important" for the recovery of peregrine falcons in New England.¹⁶



RESOURCE VALUES



Recreational:*
Canoeing & Kayaking



Wildlife:
Segment contains historic nesting site of federally endangered Peregrine Falcon which is considered best natural cliff site in Mass. for reoccupation by returning wild Peregrines

* Recreational values cited above are found throughout the segment

b. Connecticut Study Segment

1) Recreation: This segment of the Farmington River offers a broad range of conditions that attract large numbers of tubers, recreational boaters and sport fishermen. Rough estimates indicate that annually tens of thousands of recreational users participate in each of these activities on the Connecticut Study Segment.^{17,18} The densely wooded, winding river is primarily Class 1-2 water, with a short, treacherous Class 3 drop through Satan's Kingdom. The Satan's Kingdom area is a deep, gorge in which a spectacular stretch of white water is framed by extremely steep cliffs on both banks. A State owned and managed Recreation Area in the gorge area offers a developed access point to the river, and is the site of a popular tubing concession. This area is the most heavily used stretch of the Farmington River, with boaters and fishermen sharing the water with over two thousand tubers on a peak use day.¹⁹

Trout fishing is an outstanding recreational activity on this segment of the river. The area is the most intensively fished section of the Farmington. Each kilometer of the Connecticut Study Segment provides an estimated 941 fishing days annually, which translates into a total of roughly 15,000 fishing days per year in the segment.²⁰ This is the most heavily stocked area in Connecticut (see Fisheries section below) and offers high-quality fly fishing with a relatively high catch rate. Although fishing is seasonal, with roughly 60% of the activity occurring in the spring, the controlled release of low temperature water from upstream impoundments allows for summer and fall stocking, supporting an extended season.²¹ As with canoeing, the late season fishing is particularly valuable, as many other trout streams throughout the region are no longer fishable.

2) Wildlife: Bald eagles, a federally listed endangered species, have reestablished a year-round population in the study area, although there has been no evidence as yet that they are breeding here (bald eagles ceased to be a local breeding species in Connecticut in the mid-1950s). Most sightings have occurred at the Barkhamsted Reservoir, the watershed of which is closed to the public, providing the undisturbed conditions which these birds demand. In the winter months, however, the reservoir ices over and the eagles are commonly seen over the West Branch, where the faster-flowing sections of the river remain free of ice.^{22,23}

3) Fisheries: The relatively high water quality, regulated flow of low temperature water, and gravelly stream bottom combine to make this segment of the river classic habitat for salmonids. Because of these qualities, the Farmington has become a critical component in the ongoing effort to reintroduce the once plentiful Atlantic salmon to the Connecticut River basin, the southern portion of its natural range.

This massive program, which has been underway since 1967, is a cooperative venture involving numerous federal and state agencies and private organizations. Of the seven river systems targeted by the program for the restoration of salmon and other Atlantic anadromous fish populations, the Connecticut River and its tributaries, including the Farmington River, is the largest. It is one of only four river systems projected to reach their restoration potential within the next 25 years.²⁴ Through 1986, it was estimated that over \$75 million had been invested in fish passageways, a major fish hatchery and research and operational programs on the Connecticut River watershed.²⁵ If current proposals are implemented, it is projected that the Farmington will be able to sustain a population of 770 naturally spawning adult salmon, roughly one-sixth of the entire Connecticut River system's population.²⁶

The Connecticut Study Segment possesses extensive critical habitat for the salmon population. The Farmington river system, and in particular, the prime spawning grounds which are found in this study segment

“are considered critical to the success of the effort. Any significant alteration that impacts the habitat in a negative manner within these reaches will cause irreparable harm to the restoration program.”²⁷

Both private and public groups are contributing to the salmon restoration effort on the Farmington. The Connecticut Department of Environmental Protection began releasing immature salmon in the Farmington in 1976 and has carefully monitored and artificially spawned small numbers of returning adults since 1978.²⁸ In 1988, over one million newly hatched fry were released into the Connecticut Study Segment and its tributaries. The high survival and growth of the released fish indicate that the river will be able to support natural reproduction.²⁸ An electric fish ladder is in place at the Rainbow Dam below the Tariffville Gorge, and the U.S. Fish and Wildlife Service has proposed that over \$600,000 should be invested to bypass the remaining obstructions to anadromous fish migration on the Farmington.³⁰ Currently, returning adults are captured as they pass the Rainbow Dam fish ladder and artificially transported upstream for spawning, the population can freely migrate downstream. Holding ponds used for handling the returning adult population are also located within the Connecticut Study Segment.

In addition to the Atlantic salmon, nearly all of Connecticut's sport fish species can be found in the Farmington River. The river is one of the few remaining unpolluted prime trout streams in southern New England. The upper portion of the river is the most heavily stocked trout stream in Connecticut. Approximately 20,000 fish/year are released in the Connecticut Study Segment, sustaining the most intensive fishing on the river both in terms of annual and peak period

fishing.³¹ In 1988, a 2.7 mile stretch of the river from Pleasant Valley to New Hartford was designated a trout management area by the State Department of Environmental Protection, Bureau of Fisheries.³² Fishing in the area was restricted to catch and release activity, promoting catch rates of 5 to 10 times that seen in similar areas, despite more intensive fishing pressure.³³ In 1990, after a two year trial period, the State will evaluate the management area's activity levels, success rate, economic impact, and public opinion to assess the potential applicability of similar management practices on a larger scale.

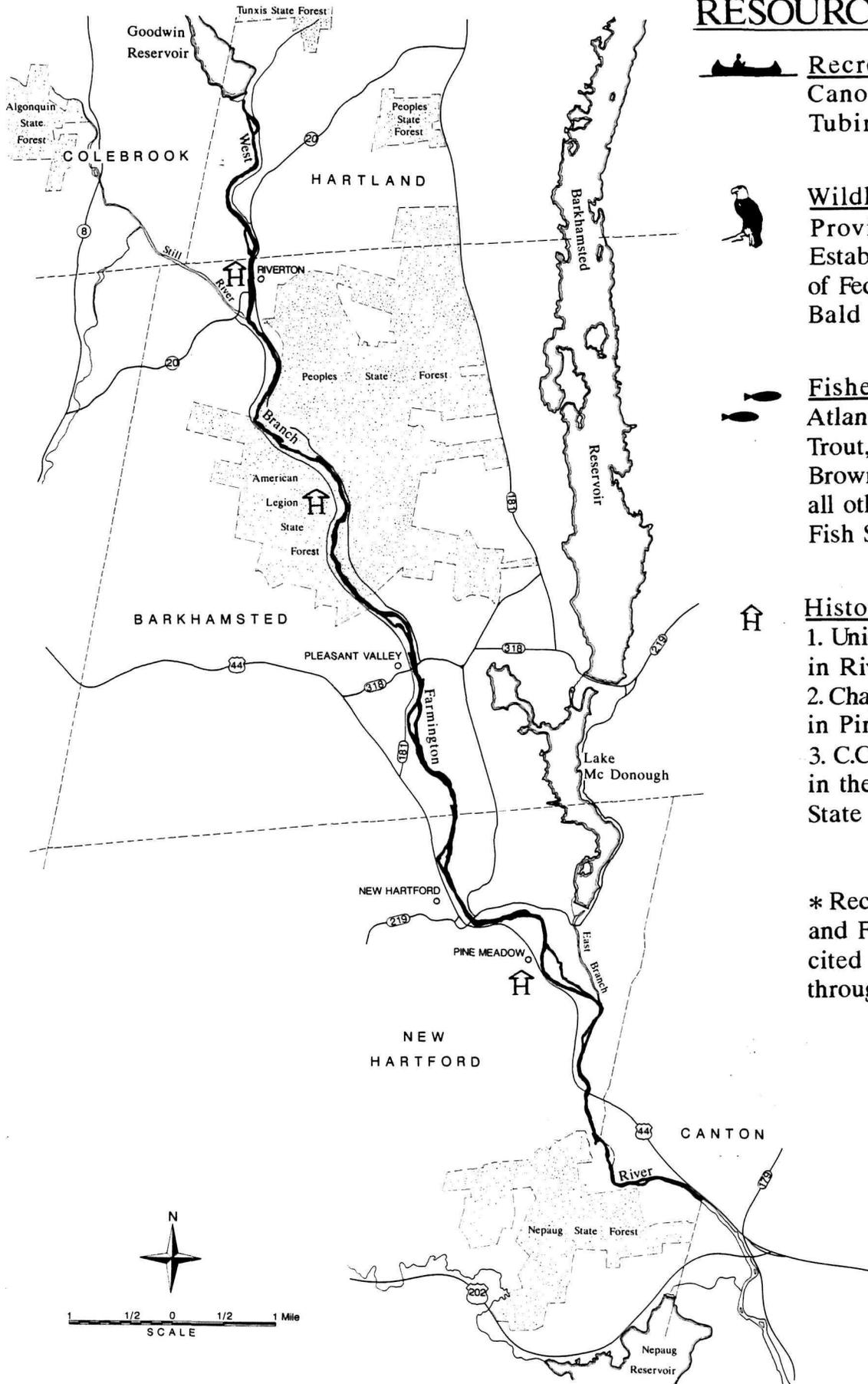
4) Historic Resources: The Farmington River is the focal point for the long history of human settlement along the river corridor. While current residents may be less immediately dependent upon the river than their predecessors for water, food, power, or other resources, the character of the communities in the river corridor has been shaped by historic ties to the river. Throughout the Connecticut Study Segment historic structures and other significant artifacts remain that speak of the river's past as a centerpiece of the local cultural heritage.

Structures dating from the nineteenth century, when mills and other hydro-powered industries lined the towns' river banks, can be found in all three of the principal communities along the Connecticut Study Segment; Riverton, Pleasant Valley, and New Hartford. The one-quarter mile wide river corridor along the river contains several nationally recognized historic sites whose past is linked to the Farmington River. The National Register of Historic Places lists three buildings, the 19th century Chapin house in Pine Meadow, the depression era CCC shelter in American Legion State Forest, and the early 19th century gothic revival style stone Union Church in Riverton.³⁴ Other outstanding examples of the general historic character of these Farmington river communities include the operational Hitchcock Chair Factory in Riverton and

the numerous 19th century buildings clustered in the state and locally designated historic districts of New Hartford and Pine Meadow.

An area including portions of Beaver Meadow in People's State Forest has been nominated as a National Historic Site in recognition of the extensive archeological remnants of pre-colonial Native American settlements. In 1986 and 1987, surveys of the Farmington's floodplain, terraces and upland areas within the People's State Forest and Nepaug State Forest by the Farmington River Archaeology Project uncovered prehistoric sites throughout the area.³⁵ New study is revealing that these were major sites, occupied year-round, and that this may have been a major trade route for the indigenous peoples. The tools and artifacts found show that this valley was a separate and distinct system from those of other regional river valleys, with different forms of land use.³⁶

RESOURCE VALUES



Recreational:*
Canoeing, Kayaking,
Tubing, Sport Fishing



Wildlife:*
Provides Habitat for
Established Population
of Federally Endangered
Bald Eagles



Fisheries:*
Atlantic Salmon, Brook
Trout, Rainbow Trout,
Brown Trout, & Nearly
all other Conn. Sport
Fish Species



Historic Structures:
1. Union Church- Located
in Riverton
2. Chapin House- Located
in Pine Meadow
3. C.C.C. Shelter- Located
in the American Legion
State Forest

* Recreational, Wildlife,
and Fisheries values
cited above are found
throughout the segment

C. Basis for Classification

In 1982, the Department of the Interior and the Department of Agriculture jointly issued guidelines outlining the general criteria for classifying National Wild and Scenic Rivers (Table I).³⁷ These guidelines stated that:

“The basis for classification is the degree of naturalness, or stated negatively, the degree of evidence of man’s activity in the river area.”³⁸

The existing conditions within and alongside the Study Segments determine the segments’ classifications as either “wild,” “scenic,” or “recreational.” The appropriate classification for the two study segments of the West Branch of the Farmington River is considered to be “recreational.” Following are the attributes upon which this determination is made.

MASSACHUSETTS STUDY SEGMENT: From the confluence with Thorp Brook in Sandisfield, MA to Hayden Pond in Otis, MA

EVALUATION FACTORS

EXISTING CHARACTERISTICS AND CONDITIONS

Water Resource
Development

The segment is free of impoundments. The “waterway remains generally natural and riverine in appearance.” Scattered modifications to the waterway, such as rip rap, road fill, and the remains of historic canals and mill races are evident.

Shoreline
Development

In some areas, the river corridor has returned to a largely primitive and undeveloped state. However, “substantial evidence of human activity” exists, particularly in the historic communities of Otis and New Boston, and limited logging and agricultural practices continue.

Accessibility

The river is paralleled by a road along its west bank throughout most of the segment. Bridge crossings are found on a rough average of one every two miles.

Water Quality

The water quality of the area meets or exceeds all federal and state standards for conservation, recreation and other uses.

APPROPRIATE CLASSIFICATION: RECREATIONAL

CONNECTICUT STUDY SEGMENT:

From the downstream limit of the intersection with the New Hartford-Canton, CT town line to the base of the West Branch Reservoir in Hartland, CT.

EVALUATION FACTORS

EXISTING CHARACTERISTICS AND CONDITIONS

Water Resource
Development

The segment is free of impoundments. The “waterway remains generally natural and riverine in appearance.” Scattered modifications to the waterway, such as rip rap, road fill, and the remains of historic canals and mill races are evident.

Shoreline
Development

Some portions of the banks of the river corridor have returned to a condition not unlike that of 300 years ago, but there are areas which exhibit “substantial evidence of human activity”, including residential and commercial structures, agricultural uses, and past and ongoing timbering.

Accessibility

Roads parallel both river banks throughout most of the segment. Bridge crossings are found on a rough average of one every 3.3 miles.

Water Quality

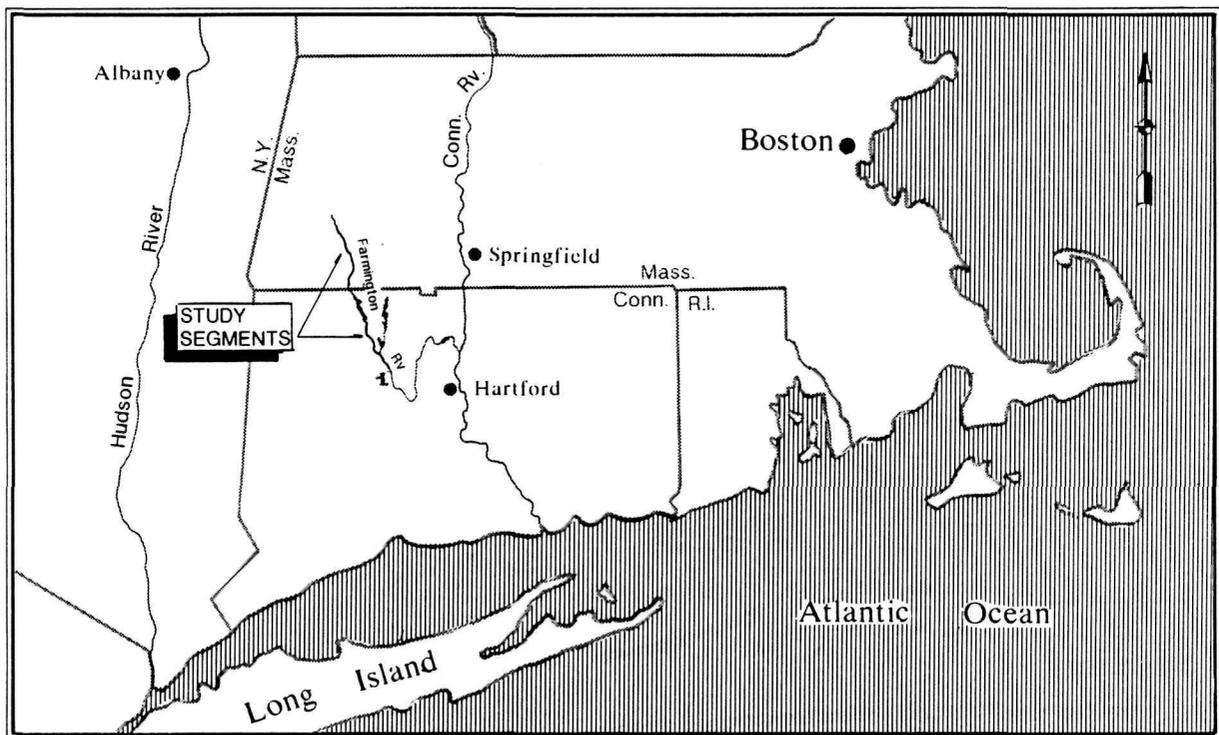
The water quality of the area meets or exceeds all federal and state standards for conservation, recreation and other uses.

APPROPRIATE CLASSIFICATION: RECREATIONAL

IV. DESCRIPTION OF THE STUDY AREAS

A. Regional Setting

The Farmington River is located on the edge of the major metropolitan region which stretches from Boston to Washington, D.C. (Map 7). The study segments are within an easy one hour drive of Hartford, Connecticut and Springfield, Massachusetts, and within two hours of Boston, Albany and New York City.



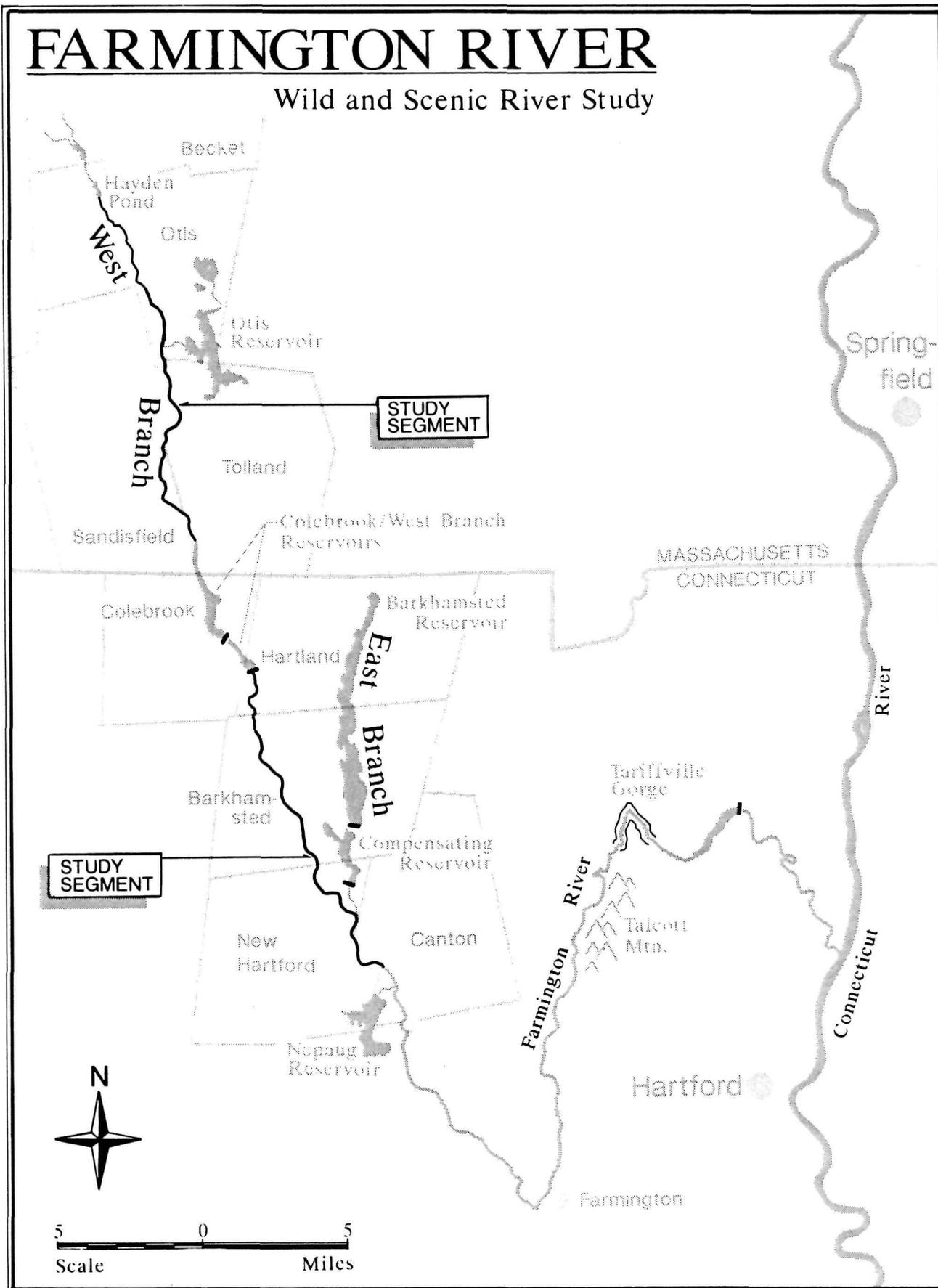
Regional Setting

(MAP-7)

The river rises from backcountry wetlands and ponds in the Berkshire Hills of southwestern Massachusetts and flows south, crossing the border into Connecticut. Meeting an ancient traprock ridge in the town of Farmington, the river abruptly turns north and runs along the base of Talcott Mountain until it finds an outlet at the Tariffville Gorge, where it changes its course again and flows eastward to its confluence with the Connecticut River (Map 8).

FARMINGTON RIVER

Wild and Scenic River Study



The changes in land use along its valley are less abrupt. Springing from highcountry forests, the river flows past small villages: remnants of thriving towns that were located here in order to take advantage of the water power. The towns are scattered in the few level and cleared areas within the otherwise heavily wooded, narrow and steep-sided river valley.

The pattern continues for some ten miles south of the state line, although each village in succession becomes somewhat larger, and scattered houses begin to be seen along the river. From New Hartford south, settlements are town-sized, and the first pockets of suburbanization and industrialization are seen. Although the scale of development increases, the essentially rural appearance of the river is never lost, as farms, suburbs and woodlands are seen in sequence on the broadening floodplain.

The 81 mile long river drains a watershed of some 600 square miles. Five major dams and related impoundments are found along the mainstem of the river: the Rainbow Dam and Reservoir, in Windsor; the Upper and Lower Collinsville Dams, in Canton; the Goodwin Dam (also known as the Hogback Dam) and West Branch Reservoir in Hartland and Colebrook, Connecticut; and the Colebrook River Dam and Reservoir, in Colebrook, the waters of which back up 1.5 miles into Massachusetts. In addition, two of the Farmington's major tributaries have been dammed for public water supply purposes: most of the waters of the Nepaug River and the East Branch of the Farmington River are now diverted to the Hartford metropolitan region and no longer flow into the mainstem.

B. Physiography and Geology

Using the system developed by N.M. Fenneman in his 1938 book, Physiography of the Eastern and Western United States³⁹, the United States can be divided into 34 natural regions called physiographic

provinces. Each province can be described by unique physical characteristics that largely result from its geologic structure. Several of these provinces are subdivided into sections. The West Branch of the Farmington River lies within the New England Upland section of the New England physiographic province. This section is characterized by a landscape in which the surrounding terrain of low, flattened hills is broken by narrow winding river valleys and mountainous outcroppings of erosion resistant rock. Altitudes in the area range from below 1000 feet to above 2000 feet. The steep slopes that are common throughout the region are the product of millions of years of hydrographic erosion of the hard underlying bedrock.

Glaciation flattened the peaks and widened the valleys along the Farmington River drainage to some extent, but its more profound impact was through the deposition of glacial debris which obstructed the river's north-south flow. As the glaciers receded, a large lake formed in the Farmington valley until a gap was eroded in the arkosic sandstone ridge at Tariffville. When the Tariffville gorge developed as an eastward outlet to the Connecticut River valley the Farmington adopted roughly its present course below the study sections. In these lower reaches, the river flows northward through a level basin, in which extensive deposits of sand and gravel, marshes, ponds and streams overlying the sandstone bedrock.

The two study segments exhibit the marked variation in physiography that is characteristic of the Farmington River Basin. The Massachusetts Study Segment begins at the base of Hayden Pond in Massachusetts and flows southeast through marshy floodplains and wetlands between gently rolling hills. As the river merges with two major tributaries, and the topography becomes more mountainous, it carves its way through a narrow forested valley. The segment ends where the river flows into the backwaters of the Colebrook Reservoir.

The Connecticut Study Segment begins just south of the Colebrook Reservoir, below the adjacent West Branch Reservoir formed by the Goodwin (or Hogback) Dam. The river continues to flow through a narrow valley until just below People's State Forest in the Barkhamsted region, where the river corridor becomes gradually broader. The channel winds around gravel islands, and is constantly eroding and reshaping the loose sediments along its banks. Below New Hartford, the river drops through Satan's Kingdom, a striking, deep gorge that has formed along a geologic fault line. After coursing through this rock-strewn chasm, the river valley once again opens into a wider floodplain.

The geology of the Farmington River basin is influenced by the bedrock materials and the overlying deposits of stratified drift and till. In the study segments, the bedrock is made up of metamorphic rock, including gneiss, schist phyllite and other minor amounts of crystalline rocks. The bedrock underlying the area is relatively hard and impermeable to water, resulting in a sharply carved river valley dissecting the poorly drained, relatively level surrounding topography.

The other geological components of the basin, stratified drift and till, are deposits of gravel, sand and silt and clay left during the last retreat of the glaciers in southern New England, and more recently, as alluvial sediments. Stratified drift is composed of sorted layers of porous and non-porous materials, making it a productive groundwater aquifer. The average thickness of the drift in the Farmington basin is about 100 feet covering approximately 22 percent of the entire basin.⁴⁰ Glacial till has a similar composition, but is poorly sorted and unlayered. It forms a discontinuous mantle over the bedrock, covering 75 percent of the river basin. The average thickness of till is five to ten feet in the basin and 25 feet in the upland areas. Till is relatively unsuitable as a water supply aquifer, because the unsorted materials are much less permeable, and very susceptible to contamination by surface run-off, septic tank effluent, barnyard drainage, and other pollutants.⁴¹

C. Hydrology and Water Quality

Although the study segments themselves are both free flowing, the Farmington as a whole is not a naturally flowing river system by a strict hydrologic definition. Upstream impoundments are used to regulate the flow rates in both areas. In addition, 20 billion gallons per year (nearly 10 percent of the river's entire outflow) is transferred from the Barkhamsted and Nepaug reservoirs in the Farmington watershed to users in the Hartford metropolitan area.⁴²

In the Massachusetts Study Segment, dams on the major tributaries, particularly the Otis Reservoir dam on the Fall River, affect water flow in the Farmington. There are a total of 15 impoundments in the Massachusetts portion of the Farmington River watershed, including dams on the Clam River, Buck River and other major tributaries.⁴³ The United States Geological Survey maintains one gaging station on this section of the Farmington River, located in the Roosterville section of Sandisfield, Massachusetts. The average discharge for the 92.0 square mile drainage area was 182 cubic feet per second (CFS) from 1913 to 1985. The maximum flow recorded at the station was an instantaneous reading of 34,300 CFS in 1955, and the minimum daily flow measured was 2.4 CFS in 1957.⁴⁴ The average flow released into the Fall River is 49 CFS, with the discharge regulated to serve recreation, fisheries, flood control and other needs.⁴⁵

In the Connecticut Study Segment, the flow rate is more directly regulated via the Colebrook and Goodwin Dams on the main stem of the Farmington. Although the impoundments have not significantly altered the average annual stream flow of 251 CFS measured at Riverton, major seasonal pulses like the 57,200 CFS flow recorded in 1955 (the river rose over 20 feet above normal levels) are no longer experienced.⁴⁶ The regulated flow and constant low temperature of waters released from the bottom of the reservoir may alter the natural ecology of the stream.

Riparian Agreements between the Metropolitan District Commission and local towns and other hydropower users have attempted to establish a system for managing the water flow to serve the multiple objectives of the river's many users. These Agreements, which were framed in 1949 and 1961, state that the natural upstream flow level can be restricted only when in excess of 150 CFS, not including releases from the Fall River. The minimum flow requirement for the Goodwin dam is 50 CFS, and the annual release must be in excess of 21.7 billion gallons with seasonal peaks.⁴⁷

The Wild and Scenic Rivers Act does not prescribe water quality criteria for the "recreational" classification. Currently, the water quality in both the study segments is very high, and the river is suitable for swimming and cold-water fisheries throughout the study area. In both states, state-wide anti-degradation policies exist which require that both study segments be maintained at their presently high water quality standards.^{48,49} Ongoing efforts to maintain and improve the generally high water quality standards of the Farmington and its tributaries are in keeping with federal guidelines for management of National Wild and Scenic Rivers and the Clean Water Act.⁵⁰

The improved water quality in the Farmington is a major success story in ecological restoration. In the past century, the river has evolved from a pollutant ridden channel, carrying the effluents from adjacent towns, paper mills and other industries, to one of the cleanest rivers in the region. The state of Massachusetts classifies the entire Massachusetts Study Segment as class B waters (swimmable, fishable).⁵¹ There are no sewage treatment plants, industrial wastewater facilities or other point sources of pollution along the segment. However, coliform bacterial counts were found to exceed the class B standards in all stations below the Fall River confluence after periods of high storm runoff.⁵² Current and anticipated water quality problems in the area are primarily related to non-point pollution from septic tank systems. A water quality management plan proposed by the Lower Pioneer Valley Planning

Commission suggested that special attention should be paid to regulating housing development, septic systems, and waste disposal in order to maintain high water quality in the watershed.⁵³ The last study of water quality along the Farmington was conducted in 1974, and is currently being updated.

The waters of the Connecticut Study Segment have similarly been classified as class A or B, high quality rivers.⁵⁴ The entire segment is classified as coldwater fisheries habitat, which dictates even stricter standards than the general Class B classification. Within the study area, the town of New Hartford and one industry, Waring Products, are licensed to discharge into the river. These effluents are sufficiently treated to maintain the class B standards. Efforts are being made to upgrade water quality in the Still and Pequabuck Rivers, the two remaining tributaries to the Farmington that as yet do not meet class B criteria. Low water quality in both cases is primarily due to inadequate municipal sewage treatment, and ongoing efforts to expand treatment facilities are expected to improve the quality of both rivers to class B conditions in 1989.⁵⁵ Both of these rivers are located outside the study segments, and their impact on the study area is minimal. Upgrading the Still River will increase the available salmon nursery habitat.

In addition to addressing the problems in these tributaries, the State of Connecticut is focusing on monitoring water quality throughout the river and developing models to predict impacts of future developments.⁵⁶ The water quality policies of both states imply that stricter than minimum swimmable, fishable standards will be enforced along the Farmington to prevent degradation of the river's currently high water quality.

D. Vegetation

The dominant vegetation along the upper Farmington is a mixed hardwood-hemlock-white pine forest. As the river runs from north to south, characteristic northern hardwood species (predominantly sugar

maple, American beech and yellow birch) are gradually replaced by central hardwoods (oaks, hickories, basswood and ash), although site-specific vegetation is heavily influenced by land use history, soil characteristics and topography. White pines are typically the dominant tree species in the early stages of succession on abandoned fields. Within the river valley, marshes, bogs and agricultural development are also significant components of the surrounding vegetation.

Both study segments provide habitats for plant species identified as rare or endangered by the States of Connecticut and Massachusetts. In general, a variety of species that are more common in northern New England reach the southern limits of their distribution in this region. The Massachusetts Study Segment runs through Berkshire county, which hosts over 40 percent of the entire Massachusetts flora, and 30 species found only within the county.⁵⁷ Although detailed inventories are lacking, the State of Connecticut lists 13 plant Species of Special Concern (SSC) that occur within the Study Segments⁵⁸, and Massachusetts identifies another 9 rare species that are found within the Farmington River's floristic province in that state.⁵⁹

E. Wildlife

The Farmington River corridor supports a large quantity and diversity of wildlife, including both game and non-game species. The variety of habitats, large areas of undeveloped land, and year-round availability of water all contribute to the area's suitability for both resident and migrant animals. A preliminary inventory of the wildlife resources of the two study segment's and their tributaries recorded the presence of 239 species of amphibians, reptiles, birds and mammals in the river corridors.⁶⁰ Conservation of this wealth of biological diversity should be regarded as one of the critical justifications for protecting the ecological integrity of the river corridor.

The Farmington's avifauna is extremely diverse. One hundred fifty-eight species (117 breeding), more than half of all the bird species of Connecticut, have been observed within the study areas.⁶¹ The region's range of habitats accommodates forest dwellers, colonial marsh nesters, raptors, wading birds and water fowl. Game birds are commonly seen and hunted along the river. Several duck species, Canada goose, ruffed grouse, and woodcock all nest in the area, and other migrant species of waterfowl are frequently observed, particularly on the larger bodies of water.

The Massachusetts Study Segment is thought to provide the best potential natural nesting habitat for the returning peregrine falcon in the state, and a variety of locally rare raptors are present in both study segments. In Connecticut, wild turkey has been successfully re-introduced throughout a broad range that includes the study segment, and the first hunting season was held in 1981.⁶² In addition, roughly 5,000 non-native ringneck pheasant are released annually for local sport hunting. One key species, bob white quail, which historically thrived in the agricultural flatlands, is no longer present in the river valley.

Among the resident mammals of the river valley, the ubiquitous white-tailed deer is certainly one of the most visible and appreciated species. In the complex of state forests adjacent to the Massachusetts Study Section, over 400 deer are harvested annually, which represents 8 percent of the entire Massachusetts hunt.⁶³ Sport hunting of deer and small game is similarly popular on the Connecticut public lands, although game is protected over a sizable area including the Metropolitan District Commission lands and Algonquin State Forest. Several riverine mammals (otter, beaver, mink, fisher, muskrat, etc.) are found in the study segments, and their populations are believed to be increasing with improvements in water quality. In total, forty-nine mammal species have been documented in the two study areas, including black bear, deer mouse, fisher, snowshoe hare, cottontail rabbit and other locally rare species.⁶⁴ Nearly all of the furbearing species are trapped at low levels.

The study segments are home to 32 species of amphibians and reptiles.⁶⁵ Roughly two-thirds of these species, including the locally rare northern spring salamander, are directly linked to the aquatic and semi-aquatic habitats surrounding the river.

The Massachusetts Division of Fisheries and Wildlife's Natural Heritage Program has identified a population of the swollen wedge mussel, Alasmidonta varicosa, a State-listed endangered species, in the Massachusetts Study Segment. The West Branch habitat is "especially important because it is one of only four extant populations documented in the Commonwealth."⁶⁶ Although the mussel was formerly found in most major drainages in the state, "it is strongly suspected that the species is declining rapidly... predominantly living in small streams which makes remaining populations highly susceptible to annihilation by only slight degrees of pollution or habitat destruction."⁶⁷

A comprehensive macro-invertebrate inventory was conducted by the state in the Massachusetts Study Segment.⁶⁸ This baseline information could be a useful tool in monitoring changes in the ecological condition of the river over time.

The Connecticut Study Segment provides habitat for a variety of mammals, birds, and amphibians which have been listed by the Geological and Natural History Survey of the Connecticut Department of Environmental Protection as "Species of Special Concern" (SSC) for the state. These are defined as "species which occur in small or reduced numbers throughout the state, based on comparisons to their historical distributions or species which are currently undergoing a non-cyclic decline."⁶⁹

The New England cottontail, the snowshoe hare, the deer mouse, and the black bear have been noted within the study corridor, with breeding status ranging from possible to confirmed.⁷⁰

The great blue heron, the common merganser, the yellow-bellied sapsucker, the cliff swallow, the magnolia warbler, and the pine siskin are avian SSC which are found here, with breeding status ranging from possible to confirmed. SSC birds which are seen here, but which are not believed to currently breed in the area, are the great egret, the bald eagle, the golden-crowned kinglet, the northern parula, the savannah sparrow, and the evening grosbeak. The osprey, an SSC, is occasionally seen.^{71,72}

The northern spring salamander is an amphibian SSC which has been sighted in the corridor and which is noted as a possible breeding species here.^{73,74}

F. Fisheries

Among its many habitats, the Farmington river supports 37 native and introduced fish species.⁷⁵ An inventory by the Massachusetts Division of Fisheries and wildlife identified 17 species in the Massachusetts Study Segment⁷⁶, and a similar group of species is believed to occur in the Connecticut Study Segment⁷⁷. Although fishing in both areas is largely oriented toward harvesting stocked trout, several other sport fish, including several species of bass are found in the study segments. The diversity of naturally occurring fish species reflects the high water quality and generally improved ecological condition of the river. Fisheries management in both study areas has focused on three species of trout (brown, brook and rainbow), propagated for sport fishing, and on a multi-state program to reintroduce the Atlantic salmon.

The Atlantic salmon restoration program is a vast, long-term undertaking begun in 1967, to which federal, state, local and private groups have made important contributions. The Farmington River system is one of the most critical areas in southern New England for the anadromous salmon population. The river and its tributaries provide an estimated 9 percent of the salmon nursery habitat found within

the entire 11,250 square mile Connecticut River basin, the largest river system in the restoration effort.⁷⁸

Private corporations have funded the construction of a fish ladder at the Rainbow dam on the lower Farmington and plans are being developed to build an additional fishway allowing the returning salmon to bypass the remaining obstruction to upstream migration, a dam below Collinsville. There is current interest in reestablishing a hydroelectric facility at the Collinsville dam. The Connecticut Department of Environmental Protection has mandated that any such project will require the development of fish ladders to allow salmon, shad and other anadromous populations to migrate as far upstream as the Goodwin Dam. At present, returning adult salmon are captured at the Rainbow dam and artificially spawned in holding ponds in the Connecticut Study Segment. Combined with nursery-raised fry and smolts, these fish are released in the study segment, lower stretches of the Farmington, and their tributaries, as starting points for downstream migrations.

It is estimated that the Farmington River can sustain a naturally spawning population of 770 adult salmon (roughly 17 percent of the Connecticut River Basin spawning population), with an annual sport harvest of 255 fish. In 1982, the U.S. Fish and Wildlife Service projected that this spawning population could be developed through the introduction of 100,000 to 300,000 immature salmon annually to the Farmington River Basin for a minimum of four years. Long-term stocking levels of 5,800 to 19,000 fish will be required to maintain the desired spawning population.⁷⁹ The Connecticut River basin is one of only four river systems expected to reach their restoration potential within 25 years. As proposed in 1984, the 25 year program to restore the Atlantic salmon population to 54,000 adults in 16 New England rivers would involve a total expenditure of over \$113 million. The U.S. Fish and Wildlife Service devotes nearly \$2 million annually to the project, with the U.S. Forest Service and National Marine Fisheries Service playing smaller roles, and state and private contributions roughly matching the federal investment.⁸⁰

Although the number of returning adults has been relatively low to date (the yearly average of returnees since 1984 has been about 38 fish , with a low of 6 individuals in 1984 to a high of 126 in 1987)⁸¹, the consistent annual return of even a small population bodes well for the eventual success of the program. It is hoped that continuing intensive management efforts will establish a naturally reproducing population and possibly support salmon sport fishing on the Farmington in the next decade.

Currently, the overwhelming majority of sport fisherman visit these sections of the Farmington to capitalize on the remarkable trout fishery. High levels of stocking (within its state boundaries, Massachusetts furnishes the Farmington with 9,400 trout annually, and Connecticut stocks the Connecticut Study Segment with an estimated 20,000 fish) allow for both very intensive fishing and a relatively high catch rate. A 1984 study reported that the cost to the Connecticut State Fisheries Department for stocking the entire Farmington with 46,500 catchable trout was \$37,000, while the estimated benefits to anglers were valued at \$245,000. The trout fishery generates an additional net economic impact of \$450,000 annually.⁸²

The popularity of fishing in the Connecticut Study Segment, and the year-round suitability of the river for trout, led the State Bureau of Fisheries to designate a 2.7 mile stretch of the river from Pleasant Valley to New Hartford as an experimental "trout management area" in 1988.⁸³ In the designated area only catch and release fishing is permitted, allowing the Bureau to stock an additional 5,000 fingerling trout which have shown rapid growth in the first six months. The area is very popular, and sustains the most intensive fishing pressure, with 5 to 10 times higher catch rates than other similar portions of the river. The experimental management designation is being evaluated for two years to assess its long-term viability for this and other areas.⁸⁴ To provide universal access to the fisheries resources, the State Bureau of Fisheries has constructed and maintains a trout fishing area with handicapped access in the Greenwoods parcel near Pleasant Valley.

With the improvement in water quality, it is believed that brown trout are beginning to reproduce naturally in both study segments. However, there are some fears that the seasonal spring water flow is not being managed optimally for the salmonid fish population.

G. Land Use

The Farmington River valley supports a broad range of land use activities. The Massachusetts Study Segment is characterized by very light development, in fact, far less than would have been found here a century ago, when water powered mills of every variety lined the banks of the river. The development that does exist is concentrated in the historical river communities of Otis and New Boston/Roosterville. The land between the communities has largely returned to woodland, and some limited timbering is taking place. Only a few parcels along the river are cleared: a few farms, a private campground, and a logging yard are seen. The northernmost 1.5 miles of the Massachusetts Study Segment is primarily wetland, some of it created by beavers.

A significant portion of the land within the river corridor is in public ownership. Parcels of Sandisfield and Tolland State Forests border the river at approximately the midpoint of the Massachusetts Study Segment, comprising 1,607 and 3,286 acres respectively. While the Sandisfield State Forest abuts the river for only 500 feet, the Tolland State Forest has 1.8 miles of river frontage. Route 8 closely parallels the west bank of the river throughout most of this study segment, making the river highly visible to users of the road. A two mile strip of land between the road and the river is owned by the Massachusetts Department of Public Works as right-of-way. However, little public access to the river is available due to the narrowness of the land and to the steepness of the slopes. The Massachusetts Department of Environmental Management is currently pursuing acquisition of selected parcels along the river for the purpose of “preservation and continuation of a wilderness corridor.”⁸⁵ The Massachusetts Legislature

has authorized \$2 million for purchase of selected riverfront parcels located between the river's source and the Route 57 crossing in Sandisfield. As of Summer, 1989, five parcels with a combined river frontage of one mile are undergoing appraisal prior to purchase, and fourteen parcels with a combined river frontage of 6.6 miles have been prioritized for acquisition.⁸⁶

At the lower limit of the Massachusetts Study Segment, just upstream from the backwaters of the Colebrook River Reservoir, the Metropolitan District Commission owns a parcel which is managed for watershed protection, and which represents 4800 feet of river frontage.

In general, the region surrounding the Massachusetts Study Segment can be characterized as an area of sparse development, with extensive forests and overgrown farmlands. The river corridor itself has very low development, and none of the neighboring townships have a population of over 1,000 permanent residents. Recently, however, portions of the region have experienced a rapid growth in development of second homes. Seasonal populations outnumber the year-round residents by three to one in some towns. Over 1,000 vacation homes surround the Otis Reservoir, which is adjacent to the study segment river corridor.

Forestry, which has traditionally been a mainstay of the local economy, has rebounded in recent years as secondary forests reach harvestable age. From 1979-1986, on the 8,225 acres of State Forests in the region, over 4.2 million board feet of timber were harvested on 926 acres. This represents more than a tenfold increase from the total of 543,000 board feet that were harvested from 1970-1980.⁸⁷ A similar increase has been seen in the small numbers of low quality trees that are harvested for firewood. All of the State Forests are managed with multiple use objectives, and steps are taken to minimize the negative visual impact and degradation of water resources that can be associated with logging. Farming continues

to disappear in the area, as agricultural lands are replaced by forests and residential development. The town of Otis estimated that one percent of the town was farmland in 1985, down from 6 percent in 1952.⁸⁸

In the upstream portion of the Connecticut Study Segment, the land use pattern and intensity of development is similar to that seen throughout the Massachusetts segment. Farther downstream, the broadened river valley accommodates a greater variety of land uses, a higher population, and the edges of suburban growth generated by the city of Hartford, only 20 miles away.

Within several hundred feet of the base of the outfall of the Goodwin Dam, both the landscape, which has been little disturbed for the last century, and the river have returned to their natural appearance. The river valley here is narrow, with hills rising steeply more than 500 feet on each side of the river. The land is completely wooded, and only a few houses are found along the road which closely borders the east side of the river.

The crossroads community of Riverton retains much of its nineteenth century character, although the mills and factories which were the reason for the settlement's establishment and growth have long since closed, burned, or been washed away. One which remains is the historic Hitchcock Chair Factory, which produces reproductions of the furniture which was first made here in 1826. The confluence of the Sandy Brook/Still River, one of the Farmington's major tributaries, is here. Just above the confluence is a large open field that provides the setting for the popular Riverton Fair, held annually in mid-October. This traditional fair, which is the last to be held in the area each autumn, has become a regional institution in the decades since it began back near the turn of the century.

A short distance downstream of Riverton are the 900 acre American Legion State Forest and the 3,000 acre People's State Forest. These large public lands face each other across the river for 2.95 miles, and are a major recreational resource. Although the nearby Algonquin State Forest is managed as a restricted use, semi-wilderness area, most of Connecticut's State Forests, including the Nepaug, American Legion and People's State Forests within the Connecticut Study Segment, are managed for multiple use activities. Developed recreational facilities are provided, the areas are managed for public hunting, and timber sales are offered for competitive bid. Firewood, mountain laurel and over 500,000 board feet of saw timber are harvested annually from the three areas.⁸⁹ Within the People's and American Legion State Forests, the river is bordered on both sides with two-lane, low speed public roads, which alternately travel along the shore line or pull back out of sight of the river in deep evergreen woods. As the river snakes back and forth, a moderately wide floodplain gives way to the steepest hills to be found within either study segment. Trails from the river lead up to overlooks from which long vistas of this deeply verdant portion of the river are visible.

Just below the state forests is found the second of the three settlements in this study segment: the small village of Pleasant Valley, a quiet and lovely "one street deep" town stretching along the river for three quarters of a mile. The town center for Barkhamsted, it is almost completely residential.

Adjoining Pleasant Valley is the 400 acre Greenwoods Parcel, owned by the Metropolitan District Commission. This land is the site of the Greenwoods Dam and Reservoir, destroyed in the 1938 flood and never rebuilt. The property stretches for 2.15 miles along the river, and all but 28 acres of it is leased to the Connecticut Department of Environmental Protection for public recreation, primarily fishing and hunting. The remaining land is the site of a former gravel operation. The MDC has restored part of the gravel bank, and is currently applying for a permit to resume gravel extraction at the remainder of the mine.⁹⁰ Regulation of the sand and gravel mining industry is a controversial issue among local

communities.⁹¹ All of the towns along the Farmington River have zoning regulations which restrict gravel and sand extraction to some extent, but more careful regulation has been called for to mitigate the long-term impacts of the industry.⁹²

There is public access to the river from West River Road only for the first 3,000 feet below Pleasant Valley; beyond that, the road pulls away from the river and ultimately joins Route 44, a more heavily travelled two-lane road. There is no public road access on the east shore of the river within the Greenwoods Parcel below a small state managed site developed cooperatively by the Metropolitan District Commission, the Farmington River Anglers Association, and the state which offers handicapped fishing access.

Directly downstream of Greenwoods is the historic town of New Hartford, the largest settlement in either of the study areas. The development of the town of New Hartford typifies, on a slightly larger scale, the trend for communities throughout the river corridor. By 1774, New Hartford was already an established agrarian community with 1,000 residents. The population grew slowly until the industrial revolution of the mid-1800s, which brought a diverse array of industries to the town, largely centered around water power. The populace reached a peak of over 3,300 inhabitants in 1880. With the general economic decline of the late-1800s, the town shrank rapidly, and population was cut nearly in half by 1900. In the last century, the town has gradually regained its numbers, boasting 4,100 people in 1975 and roughly 5,000 current residents. The rapid recent increase reflects the expanding growth of nearby metropolitan Hartford, and increased activity in tourism and other service-based industries.

New Hartford's town center is found at the river's edge, and historic structures, including the old Greenwoods Mill, extend upriver for half a mile. On the west bank, steep-sided Jones Mountain rises directly from the river, providing an abrupt edge to the town, and forcing the river into a ninety degree

turn. The mountain separates New Hartford from the smaller village of Pine Meadow. Pine Meadow's town common is intact, and the area around it has recently been designated as a historic district by the Town of New Hartford.⁹³

For a mile below Pine Meadow, the valley on the west side of the river, along Route 44, is relatively broad and level, and the former farmland there is beginning to be changed to typical highway uses: strip commercial, small assembly plants, and apartment buildings, some of which is visible from the river.

The east bank of the river has an entirely different character. Below New Hartford, the public road pulls away from and out of sight of the river, and the land abutting the river is largely undeveloped. It is at this point that the East Branch of the Farmington River, released from the Barkhamsted and Compensating Reservoirs (Lake McDonough), joins the West Branch.

At the point where Route 44 crosses the river to the east side, the river valley changes radically. The river has downcut along an old faultline and created a gorge with almost vertical, 200 foot high walls: Satan's Kingdom. This 1500 foot long gorge, which is a favorite site for white water boaters and tubers, has only limited road access on the west side of the river in Nepaug State Forest. The Tunxis Trail, an eighty mile Connecticut Blue Blaze hiking trail, crosses the river at this point on its route from Bristol to the Massachusetts border.

Below Satan's Kingdom, on the west side of the river, the remaining 1.25 miles of the study segment has only limited road access, and remains undeveloped. The 1200 acre Nepaug State Forest parallels the river in this area, and directly abuts the shoreline for roughly one-half mile. On the east side of the river below Satan's Gorge, a small, low density housing development abuts the river for a short distance before Route 44 sweeps back, hugging the shoreline to the end of the study segment.

H. Recreational Resources

The unique opportunities for boating and fishing along the study segments are part of the outstanding resources that make these sections eligible for consideration as National Wild and Scenic Rivers. Both the white-water rapids and the trout sport fishery are regionally significant resources. Rough estimates of the direct use of the river indicate that as many as 30,000 tubers, 20-30,000 fisherman and thousands of boaters visit the study areas annually.^{94,95} Over 40 canoeing and kayaking groups from seven states regularly use the river for group outings, and scores of unaffiliated boaters from around the Northeast use the river individually. Both study segments also offer several excellent stretches of rapids for poling. The single licensed tubing outfitter frequently reaches the maximum use level set by the State at 7,500 tubes on the river at one time. The tubing concessionaire estimates that use has doubled in the past three years⁹⁶. In addition to these extraordinary features, the river corridor offers a wide array of other outdoor recreation opportunities, including picnicking and swimming in the summer, and cross-country skiing and snowmobiling in the winter.

Camping is another very popular activity along the river corridor. Both of the campgrounds on the river in the Massachusetts Study Segment and the developed facilities in the American Legion State Forest in the Connecticut Study Segment seasonally receive capacity use. Developed facilities for picnicking and day-use also exist at several points along the river, and extensive systems of hiking trails are found within many of the neighboring State Forests. The three State Forests in the Connecticut Study Segment received an estimated 145,000 recreational visitors in 1987.⁹⁷ The inter-state Tunxis trail traverses the People's Forest and crosses the Farmington at the Route 44 bridge over Satan's Kingdom. Extensive deer and small game hunting is permitted on most public lands. The spectacular New England fall foliage attracts thousands of motorists annually to the scenic roads along the river's banks.

I. Scenic Resources

The visual diversity of the upper Farmington River valley is a key element contributing to the character of the area. The varying degrees of development along the river corridor provide scenic images that range from primal forests to pastoral farmlands to rustic small town settings. The hills and rural highways lining both banks of the river form visually attractive scenic corridors. Constantly changing hardwood forests, deep shadowy gorges, and high rock outcroppings that offer unbroken panoramas of the surrounding countryside provide a remarkable counterpoint to the sparkling waters that in turn tumble through rock strewn valleys and meander over marshy floodplains. Viewers are also frequently drawn to the scenic spectacle of white-water canoers, tubers and trout fishermen plying the river.

In 1983, the University of Massachusetts conducted a detailed assessment of the visual quality of the Massachusetts Study Segment.⁹⁸ Using various methodologies, the river corridor south of Otis was consistently ranked as a high visual quality area. The section of the river corridor between Otis and New Boston was the only area in the entire Massachusetts watershed identified as possessing both high scenic quality and an intact "natural quality", reflecting little evidence of human modifications. The study concluded that this stretch of the river is "important to the scenic quality and general character of the whole river basin".⁹⁷

The Connecticut Study Segment offers a similar range of visual diversity. The Satan's Kingdom area is perhaps the most spectacular scenic resource in the segment, as well as the most heavily visited area. The steep-sided, 200 foot deep and 1500 foot long gorge supports a broad range of recreational activities. Remarkable views are offered both from the river within the gorge, and on the trails and bridge skirting the cliffs above. The entire area is heavily wooded with hemlocks and a variety of northern hardwood species. Other examples of the scenic diversity in the Connecticut Study Segment range from the historic river communities to the essentially primitive river corridor bordered by the People's and American Legion State Forests.

The Farmington's river-related topography and landforms, coupled with the river's undeveloped, free-flowing character make the river a unique scenic resource in the New England uplands region.

Overall, the study segments and the surrounding lands retain a natural character only moderately altered by human activities. The river is typically bordered by dense forests, but the natural setting is periodically broken by agricultural fields and small historic towns. This contrasting inter-relationship is not only an attraction to recreational visitors, but also a fundamental part of the local communities' self-image.

J. Historic Resources

The Farmington has been called a "community river"¹⁰⁰, an apt descriptor for a river that has supported over three centuries of land use activities. The natural resources of the river valley have hosted developments which have progressed from ancient Native American settlements through a wide range of agricultural and industrial enterprises. The river itself has long been a focal point for settlements, as a source of hydropower and fresh water.

Although colonists in the eighteenth century were chiefly dependent upon agricultural activities, the river was soon harnessed to serve saw and grist mills, tanneries and other industries involved in processing primary resources. A dam was constructed at Satan's Kingdom as early as 1750 to capture the river's power, and river impoundment has continued through the development, in 1969, of the multiple-use Colebrook Reservoir.

With the industrial revolution from 1820 to 1850, the human population in the river valley increased rapidly, and new activities, iron foundries, paper mills, textile factories and other industries were introduced to the area. Industrial pollution and deforestation of adjacent lands rapidly devastated the environmental quality of the river and surrounding corridor. As early as 1836, an observer in

Barkhamsted lamented:

"The mountains and hills were formerly covered with excellent timber, consisting of oak, chestnut, sugar maple, beech, pine and hemlock; a considerable portion of which has been destroyed by wind and fire, and by the axe, under a system of improvidence, at a time when timber was considered of no value".¹⁰¹

By 1860, water as far north as New Boston was unsafe for swimming, and trout were virtually absent.

In an abrupt reversal, western Massachusetts and Connecticut experienced a general economic decline through the second half of the nineteenth century as the small-scale hydropowered operations could not compete with farms and industries in other regions of the nation and with steam-powered mills in the larger cities. Most factories and mills along the Farmington closed, and the local population diminished sharply, as did the associated degradation of the river ecology. The major human impact on the Farmington in this century has been dam building activities aimed at supplying the growing Hartford population with drinking water, regulating floods, and serving the few remaining factories.

Remnants of the long history of settlements, industries and river impoundments can still be seen throughout both of the study segments. In the Massachusetts Study Segment, the town of Otis conducted an inventory of historic places in 1983 that lists 73 historic buildings and other resources.¹⁰² The town is considering the possibility of designating a local historic district encompassing 12 of the nineteenth century structures in the center of town. The townships along the Massachusetts Study Segment have supported a small, largely rural population for over three centuries. Although a systematic historic inventory has never been conducted in the area, the river corridor undoubtedly holds resources similar to those found throughout the region.

Along the Farmington between Otis and New Boston, ruins of century-old iron foundries are slowly being subsumed by the returning forests. The Inn in New Boston is an historic landmark that dates back to 1737, testimony to the long history of travel to the scenic environs.

More extensive documentation exists of the historic heritage of the towns in the Connecticut Study Segment. The segment holds three buildings listed on the National Register of Historic Places¹⁰³, and an additional thirteen listed on the Connecticut State Register.¹⁰⁴ In particular, the town of New Hartford, largely due to local initiative, has promoted extensive recognition and conservation of its historic resources. The town, founded in 1733, hosts nine buildings listed on the State Register, including residences, churches, businesses and a former railroad station.¹⁰⁵ In addition, the entire nineteenth century business district is state listed as a state historic area. Despite an extensive fire in the nineteenth century, it is estimated that 16 of the town's building date back to 1775, and 130 are pre-1850 constructions.¹⁰⁶ The center of neighboring Pine Meadow has also been designated a historic district in recognition of the outstanding nineteenth century structures remaining in the small settlement.

Within the township of Barkhamsted, the communities of Riverton and Pleasant Valley have similar historic resources. Two buildings in Riverton are listed on the State Register: the famous Hitchcock Chair factory, which dates to 1818 and has been restored to operational condition; and a nineteenth century stone church, which houses a small museum displaying local artifacts. The Old Riverton Inn, from the same century, has been restored with period furnishings. Just north of Riverton lies a private residence that dates back to 1796. The 1846 Methodist Church in Pleasant Valley is also of historic significance and maintains a small historic exhibit.

Remnants of the Native American presence along the Farmington River are far less visible. Evidence indicates that the river valley harbored several permanent settlements as well as a major east-west route

of travel.¹⁰⁷ Extensive archaeological remains have been documented in the People's State Forest.¹⁰⁸ Historically, the native tribes relinquished most of their property rights to the valley in a 1640 treaty that was later bitterly contested. Small residual native American populations remained in New Hartford and Riverton into the early nineteenth century, and groups remained in Nepaug State Forest as late as 1890, but essentially the native cultures that had existed in the area vanished in a little over one century.

The long history of utilization of the area's natural resources has undergone a cyclical progression. Due to changes in the local economy, shifting social values, and a long tradition of conservation efforts, the river is in better ecological condition now than it has been in over 150 years. As settlements grew in size and established permanence, concern soon developed that resources should be managed for long-term sustainability. Efforts by individuals, clubs and government agencies to restore the once-plentiful fisheries of the Farmington began as early as 1925.¹⁰⁹ The private non-profit Farmington River Watershed Association was formed in 1953 to promote protection and improvement of the river. More recently, a strong commitment and heavy financial investments have been made by state and local governments and the Hartford Metropolitan District Commission to maintain and improve water quality throughout the Farmington basin. The widely respected ecological restoration of the river reflects this history of interest in the wise management of the Farmington and its resources.

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TABLE 1

CLASSIFICATION CRITERIA FOR WILD, SCENIC AND RECREATIONAL RIVER AREAS *

ATTRIBUTE	WILD	SCENIC	RECREATIONAL
Water Resources Development	Free of impoundment.	Free of impoundment.	Some existing impoundment or diversion. The existence of low dams, diversions or other modifications of the waterway is acceptable, provided the waterway remains generally natural and riverine in appearance.
Shoreline Development	Essentially primitive. Little or no evidence of human activity. The presence of a few inconspicuous structures, particularly those of historic or cultural value, is acceptable. A limited amount of domestic livestock grazing or hay production is acceptable. Little or no evidence of past timber harvest. No ongoing timber harvest.	Largely primitive and undeveloped. No substantial evidence of human activity. The presence of small communities or dispersed dwellings or farm structures is acceptable. The presence of grazing, hay production or row crops is acceptable. Evidence of past or ongoing timber harvest is acceptable, provided the forest appears natural from the riverbank.	Some development. Substantial evidence of human activity. The presence of extensive residential development and a few commercial structures is acceptable. Lands may have been developed for the full range of agricultural and forestry uses. May show evidence of past and ongoing timber harvest.
Accessibility	Generally inaccessible except by trail. No roads, railroads or other provision for vehicular travel within the river area. A few existing roads leading to the boundary of the river area is acceptable.	Accessible in places by road. Roads may occasionally reach or bridge the river. The existence of short stretches of conspicuous or longer stretches of inconspicuous roads or railroads is acceptable.	Readily accessible by road or railroad. The existence of parallel roads or railroads on one or both banks as well as bridge crossings and other river access points is acceptable.
Water Quality	Meets or exceeds Federal criteria or federally approved State standards for aesthetics, for propagation of fish and wildlife normally adapted to the habitat of the river, and for primary contact recreation (swimming) except where exceeded by natural conditions.	No criteria prescribed by the Wild and Scenic Rivers Act. The Federal Water Pollution Control Act Amendments of 1972 have made it a national goal that all waters of the United States be made fishable and swimmable. Therefore, rivers will not be precluded from scenic or recreational classification because of poor water quality at the time of their study, provided a water quality improvement plan exists or is being developed in compliance with applicable Federal and State laws.	

* Table to be used only in conjunction with text.

