land acquisition is not envisioned as a part of the wild and scenic program in this case. The river management plan should rely on existing local land use controls, state authorities, and voluntary private sector and landowner actions."[5] Former Connecticut Senator Lowell Weicker, Jr., who sponsored the study legislation in the U.S. Senate, provided similar direction in his testimony.

The statements of Congresswoman Johnson and Senator Weicker directly reflected both the predominance of private land ownership and the strong traditions of home rule and local control over land use that exist in the Farmington Valley towns, as well as elsewhere in New England. There is virtually no existing federal land abutting the Farmington River Study Segments,[6] and local residents expressed strong opposition to any new federal land acquisition or control over the Farmington Valley that might result from the Wild and Scenic River Study and potential designation.

In response to those local concerns and the strong guidance from Congresswoman Johnson and Senator Weicker, federal land acquisition and management were not considered as possible conservation techniques for the Farmington. Instead, the study focused on using private, local and state actions to ensure the compatible management of river corridor lands.

The same local concerns have created considerable controversy on a number of other northeastern "private land rivers" that have been considered for Wild and Scenic designation in the past twenty years. Several rivers (for instance, the Housatonic and Shepaug in Connecticut, the Penobscot in Maine, and Fish Creek in New York) were found to be eligible for federal protection, but none were designated because of a lack of local political support stemming from the fear of federal land condemnation and loss of local control. On other private land rivers that did receive designation from Congress — most notably the Upper Delaware in New York and Pennsylvania — local concerns about the potential for federal land acquisition and top-down management after designation resulted in protracted and contentious efforts to prepare a management plan that all parties ultimately could accept.

The approach used in the Farmington River Study — eliminating any consideration of federal land acquisition and management from the process — evolved specifically in response to that problematic history.

- **Reliance on Local, Regional, State and Private Actions to Protect the River Corridor:** Instead of the traditional dependence on federal land acquisition as a primary mechanism to protect the river corridor, the Farmington River Study focused on encouraging those who have had long-standing responsibility for management of the corridor—namely, riverfront landowners, the local communities, regional authorities, state agencies, and private organizations—to take the actions needed to ensure compatible management of lands along the river.

  The strong protection from adverse water resource projects available only through Wild and Scenic River designation was used as incentive to motivate these interests to provide comparably strong protection to the land resources under their jurisdiction. This incentive-based approach contrasts sharply with the threat of potential federal land condemnation that traditionally has been used to motivate local communities along designated private land rivers to provide compatible shorelands management.

  The reliance on non-federal actions and local stewardship to provide the necessary protection for the river corridor was a central element of the project's "bottom-up" philosophy.

- **Implementation of River Conservation Actions <u>During the Study</u>:** In the past Wild and Scenic River studies, little effort has been made to pursue implementation of actions to strengthen river protection during the study period. Instead, implementation typically has been left until after designation, when the federal managing agency usually has the authority to acquire land as a way of ensuring protection if the local communities are unwilling or unable to do so themselves. This has often resulted in a threatening, adversarial relationship between the managing agency and the local communities.

  The Farmington River Study reversed that pattern by encouraging the riverfront communities, state agencies, riparian landowners, and private groups to take actions to strengthen protection for the river <u>during the study period</u>. The specific actions ultimately pursued were selected after a thorough evaluation of the adequacy of existing protection measures and a review of alternative protection methods that had been used successfully on other rivers.

  This approach was designed to achieve three principal objectives:

  (1) it would improve protection for the river, regardless of the ultimate decision on Wild and Scenic River designation;

  (2) the additional protection would be an important component in making the river suitable for Wild and Scenic designation, thereby keeping the option to pursue designation available to the riverfront communities and other study participants; and

  (3) achieving the necessary protection during the study would give the communities a full understanding of

[5] Testimony of Congresswoman Nancy L. Johnson before the U.S. House of Representatives' Subcommittee on National Parks and Recreation, October 4, 1985.

[6] The only exception is a small strip of Army Corps of Engineers land above Colebrook Reservoir in Massachusetts.

the commitments they would be expected to maintain before making a decision on designation.

A description of the specific conservation actions that were implemented over the course of the study is provided in **Chapter 4: Resource Management and Protection.**

- **Special Water Resources Studies:** Because of the long-standing concerns about possible future water supply withdrawals from existing reservoirs on the Farmington's West Branch in Connecticut, two special assessments of water needs were initiated:

  (1) Information was gathered and analyzed regarding the future water supply needs of the greater Hartford area and the likelihood of withdrawals from the West Branch ever being needed to augment existing sources of supply. This evaluation, which was requested by Congress in the House of Representatives' Committee Report that accompanied the study legislation, focused on the Hartford Metropolitan District Commission's long-range water supply planning documents.

  (2) A comprehensive "instream flow study" was conducted to provide information on two fundamental questions:

  First, what river flows are needed to maintain the Farmington's fisheries, recreation, and scenic resources?; and

  Second, is there sufficient water in the West Branch under different rainfall conditions to allow for withdrawals without adversely affecting those resources?

  The study participants recognized that answers to those two questions were critical both for long-term management of the river and, more immediately, to determine whether any future withdrawal could theoretically be compatible with Wild and Scenic River designation.

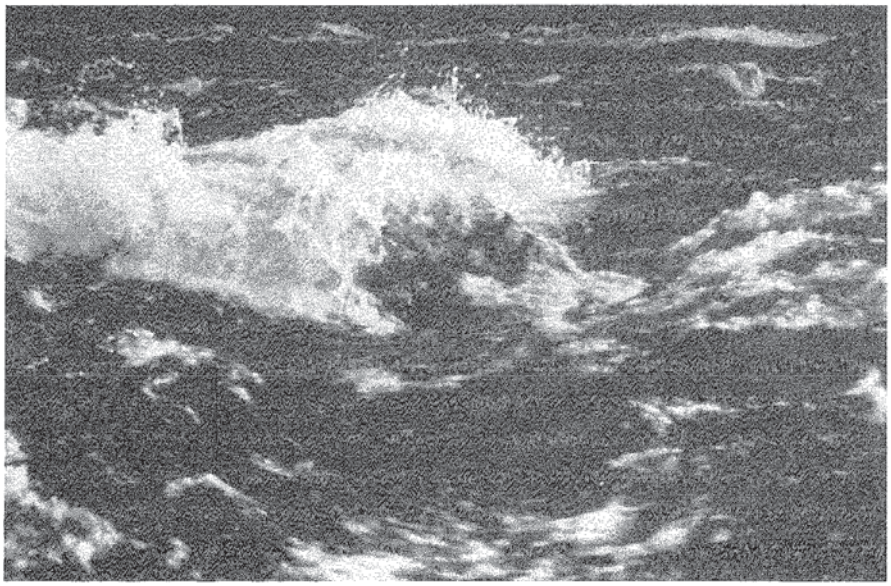
  These elements of the study are described in greater detail in **Chapter 5: Water Resources Studies.**

- **Long-term Management Based on a Cooperative Partnership:** As on most private land rivers, authority over the various aspects of river management on the Farmington River is shared among many different entities, with no single entity playing a truly dominant role. This being the case, the Study Committee recognized that effective long-term management of the river could only be achieved through a cooperative partnership involving all of the major parties with a stake in its future - local and state government, riverfront landowners, the FRWA, the MDC, recreationists, and other river interests.

  The Study Committee also acknowledged that if the river ultimately was to be designated as a Wild and Scenic River, the federal government would have important responsibilities as a member of that partnership (for instance, in implementing the protections against adverse water resources projects provided by the Wild and Scenic Rivers Act, and providing technical and financial assistance). However, it was agreed that the federal role could not, and should not, be the dominant one of primary manager that had typified most designations over the 25-year history of the Wild and Scenic Rivers System.

- **Preparation of a River Management Plan <u>During</u> the Study:** The central focus of the Farmington River Study was to develop a river management plan that would identify a long-term strategy for protecting the river's critical resources and clearly define the roles, responsibilities, and authorities of the various river interests. Traditionally, a river management plan is prepared after Wild and Scenic River designation is granted. For the Farmington, however, study participants concluded that it would be impossible to make a final decision on designation without knowing beforehand how the river would be managed following designation. Furthermore, the participants agreed that a management plan was needed regardless of whether the river was ever designated.

  The Farmington River Study represents the first time in the history of the National Wild and Scenic Rivers System that a comprehensive management plan has been prepared prior to designation of the river in question. A summary of the Farmington's final plan, which is entitled <u>The Upper Farmington River Management Plan</u>, is provided



In order to address long-standing questions about the effects of potential water withdrawals, the Study Committee initiated a detailed analysis of the river flows needed to maintain the Farmington's fisheries, recreation, and scenic resources.

in **Chapter 7**. The full Management Plan is published separately as a companion to this report.

- **Local Control in the Final Study Outcome:** For a river such as the Farmington that is surrounded predominantly by private lands and where protection and compatible management of those private river corridor lands are to be achieved through the actions of landowners and local government rather than through federal acquisition and management, strong local support for Wild and Scenic River designation is essential. As a result, each of the towns in the study area was asked to make a formal decision through a town meeting vote to determine whether the community supported Wild and Scenic designation. The National Park Service and the Farmington River Study Committee reiterated throughout the study that they would recommend designation for each of the study segments only if there was a clear indication of local support through those town meeting votes.

  The results of town meeting votes that were held in each of the study area communities are presented in **Chapter 6: Support for River Protection and Designation**. The outcomes are reflected directly in the suitability findings for each of the study segments (see **Chapter 8: Suitability**), and in the Farmington River Study Committee's final recommendations on designation (see **Chapter 9: Conclusion**).

1.3.2 Tasks Accomplished During the Study

Over the course of the project, the Study Committee and the National Park Service accomplished the following tasks:

* Identified key issues and threats facing the river;
* Established goals for the study process and the river management plan;
* Assessed river resources to determine eligibility for Wild and Scenic River designation;
* Evaluated existing protection for the river;
* Reviewed alternative methods for protecting the river through private, local and state actions;
* Assessed water supply needs of the greater Hartford area;
* Assessed resident and landowner attitudes about the river and possible methods to protect it;
* Requested each town in the study area to provide evidence of local attitudes regarding Wild and Scenic River designation through formal town meeting votes;
* Encouraged the riverfront towns, along with landowners, private organizations and the states, to implement specific actions to provide stronger protection for the river;
* Assisted in the initiation of a private-land protection program designed to facilitate the voluntary donation of conservation easements along the river;
* Conducted an instream flow study to determine the flows necessary to sustain the river's fisheries, recreation, and scenic values, and to evaluate whether sufficient water exists to maintain those values while allowing for specified levels of withdrawal for water supply;
* Developed a comprehensive river management plan to provide for the long-term protection and balanced management of the Connecticut Study Segment; and
* Prepared this study report, which summarizes the results of all of these tasks and presents findings on the Farmington's eligibility and suitability for Wild and Scenic River designation.

Each of the steps listed above included appropriate public outreach activities to encourage the broadest possible participation by interested individuals and organizations.

1.4 Issues and Goals

The first major tasks of the Study Committee were to identify the key issues associated with the Farmington River, and then to develop goals for the study process and the conservation and management of the river that would address those issues. These issues and goals provided the context for conducting all subsequent study components.

1.4.1 Issues

In the spring of 1989, the Study Committee and the National Park Service sponsored four workshops throughout the study area to identify key issues related to the river and the study. Nearly 200 people attended the workshops and identified over 145 issues. The issues identified most frequently are summarized below.

Committee members solicit public input at one of four workshops held to identify key issues affecting the river.

One of the most frequently identified issues was the need for additional management of increasing recreational use on the river.

- **River Corridor Management:** The predominant issue from the workshops was concern about impacts of the study and potential Wild and Scenic River designation on private landowners. Questions focused on the perceived threat of land acquisition; restrictions on land use; effects on property values, taxes, and sales; and concerns about public access and trespass. Many people wondered who would have long-term management authority and responsibility for implementing the river management plan, and emphasized the need to maintain local autonomy in managing land use and growth. Several people noted the critical role of adjacent landowners in protecting the river, and suggested using incentives to encourage landowners to protect open space through private conservation measures.

  Participants also questioned whether existing regulations and enforcement were providing adequate protection to the river. They felt that inconsistent regulations between neighboring towns and a lack of cooperation at all levels of government were magnifying this problem. They also suggested that local communities might not have the information, planning experience, and funding necessary to cope with the development pressures that were evolving along the river.

- **Water Quality and Quantity:** Attendees identified a wide range of concerns about water quality, including sand and salt runoff from Route 8 in Massachusetts, non-point source pollution from adjacent developments and agricultural lands, pollution of groundwater along the river, and sewage impacts on the mainstem and tributaries. Concern also was expressed about the possibility of a hazardous waste spill on Route 8 in Massachusetts. Questions were raised about existing and future water quality monitoring, and whether designation would limit future licensing of sewage treatment plants, thereby restricting development.

  Possible diversions from the river and the need to maintain adequate flows for fisheries, recreation, scenic qualities, and adjacent aquifer recharge were a predominant concern throughout the four workshops. Several people felt that guaranteed flows should be provided for downstream users in both states. In addition, many Massachusetts residents did not want future dams and hydroelectric development that would affect flows in the West Branch or its tributaries.

- **Recreation:** Participants described problems associated with current recreational use of the river, including traffic, parking, litter, trespassing, vandalism, noise, overcrowding, and conflicts between recreationists (e.g., between boaters and fishermen, fishermen and tubers, etc.). A general need was expressed for both proper recreational access points and better management of the rising numbers of people using the river. Many feared that increased recreational use could intensify the existing problems, further degrade the river and its related resources, and burden town and state support services. Some questioned whether designation would generate increased river recreation.

- **Land Use:** Many workshop attendees expressed concern about incremental development and unsightly land use practices degrading the natural character of the river. Parking along Route 8 in Massachusetts and sand and gravel operations in both states were identified as specific problems. Several people favored increased restrictions on timber harvesting, but others felt a need for fewer regulations. Some were curious about the effect the study and potential designation would have on lands adjacent to tributaries, and whether designation would limit the towns' ability to grow.
- **Resource Protection:** Fish and wildlife were highlighted as critical resources needing protection, and many questioned the impact future development along the mainstem and tributaries would have on these resources. A particularly strong desire was expressed to protect the river's outstanding trout and salmon values. Many supported "catch and release" areas as an effective fisheries management tool. Several people identified a need for further protection of wetlands, while others emphasized the preservation of historic structures and the scenic character of the river corridor. There was also recognition that protecting the river's natural resources is essential for the economic health of the Farmington Valley.
- **Public Awareness and Education about the Study:** Much of the discussion at the workshops centered on general questions about the study, including: the process; the restrictions of the Wild and Scenic Rivers Act; relationships among the Study Committee, the towns, the states, and the federal government; the boundaries of the study area and management boundaries associated with designation; and the types of local actions necessary to protect the river and make it suitable for designation. There was general agreement that the Study Committee and the National Park Service needed to increase awareness and education about the study through outreach to landowners, local groups and schools, and through increased publicity of Committee meetings and activities. Participants stressed that the issues identified by the public at the workshops needed to be followed up on in the ensuing phases of the study.

1.4.2 Goals

Based on the issues identified at the public workshops, the Farmington River Study Committee adopted the following set of goals for the study process and for the conservation and management of the two study segments:

Overall Priorities:

- Increase public awareness of the study process, and encourage broad participation in the development of the Farmington River Management Plan.
- Determine the quantity and quality of water needed in the Farmington River to preserve its recreation, fisheries and scenic qualities.

Study Goals:

Develop a River Management Plan that will do the following:

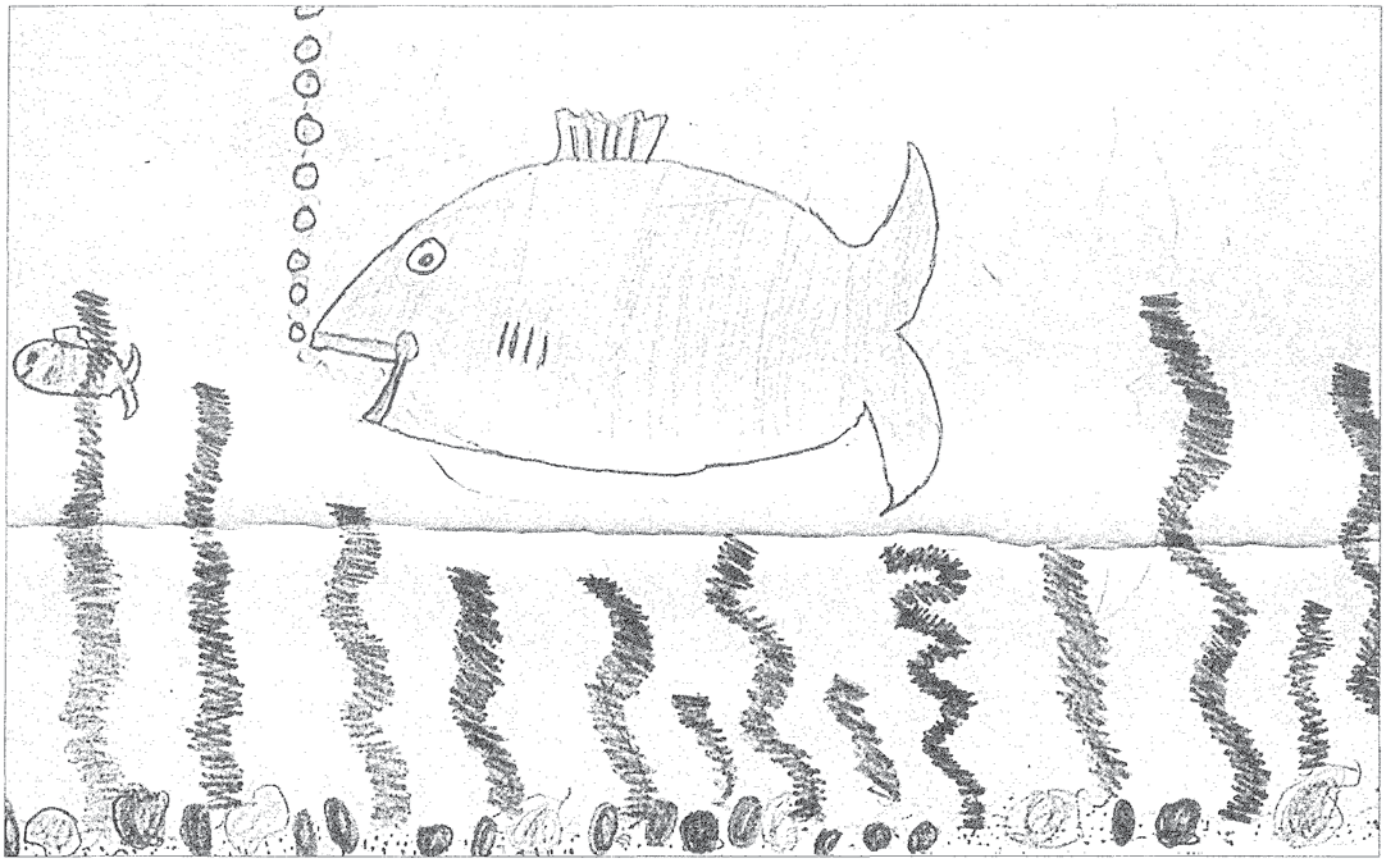
(1) Conserve and enhance important land-based natural and cultural resources, including wildlife habitat, forests, diverse landscapes, and the scenic and historic character of the Farmington Valley;

(2) Encourage effective management of river-related growth that will protect the river's special qualities, and that will emphasize existing local control and the rights of private property owners;

(3) Manage river recreation to minimize resource degradation and impacts on private and public landowners, while providing for appropriate recreational use and public access;

(4) Balance the legitimate demands on the river for water supply, waste assimilation, energy production, and commercial and industrial uses, while maintaining stream flow and water quality necessary to sustain fisheries, recreation and scenic qualities at levels sufficient for potential Wild and Scenic designation.

These goals provided the philosophical foundation for the Study Committee's efforts throughout the remainder of the project.



Chapter 2: Description of the Study Area

One day we were going to the Riverton Ball field. On the way to the field we passed the Farmington River. At we went by there or four cars were parked near the river. We went over to see what was happening. Well we stepped out of the car and saw a fisherman pulling in a huge rainbow trout. We stood there for about five minutes watching him pull in the beautiful fish from the Farmington River. It was fabulous to see the fish and try to fight the fisherman's line. After a while the man lifted the fish out of the River for all the people to see. Everybody cheered and clapped for the catching of the enormous Rainbow Trout.

Eric Smith

This chapter provides an overview of the character and resources of the Farmington River study segments and the surrounding area. The purpose of the chapter is to familiarize the reader with the existing condition of the river and its adjacent lands through descriptions of first, the general regional setting (including geography, history, demographics, land ownership, and land use), and second, the river's natural, cultural and recreational resources. Additional information on these subjects can be found in two companion documents to this report — the Draft Eligibility and Classification Report (August, 1989), and the Draft Evaluation of Existing Protection (June, 1990).

2.1 Regional Setting

2.1.1 Geography

The Farmington River is located in the rolling, forested hills of southwestern New England, on the periphery of the major metropolitan region stretching from Boston, Massachusetts to Washington, D.C. The study segments are within an hour's drive of Hartford, Connecticut and Springfield, Massachusetts, and within two hours of Boston, Albany and New York City. (See **Map 1-1.**) Despite this proximity to urban areas, the river flows through a remarkably undeveloped and forested valley, interspersed with small New England communities.

The study segments flow through a number of small communities typical of rural New England, including the town of New Hartford, Connecticut, shown here.

The river originates in the Berkshire Hills in southwestern Massachusetts and flows south into northwestern 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 through Tariffville Gorge, where it turns to the east and flows into the Connecticut River in the Town of Windsor. The river is 81 miles long overall and drains an area of some 600 square miles. The Wild and Scenic River Study Segments include a total of approximately 28 river miles in the upper part of the basin, not including the area impounded in the Colebrook and Goodwin Reservoirs. (See **Map 1-1** and **Subsection 2.2.3: Hydrology** for further description.)

Springing from high country wetlands and ponds, the river flows past small Massachusetts villages, vestiges of larger towns that were originally located here to take advantage of the river's energy for powering mills. These towns are scattered in the few level and cleared areas within the otherwise heavily wooded, narrow and steep-sided river valley. This pattern continues into Connecticut, although each village downstream becomes successively larger, and development near the river increases. From New Hartford downstream, the larger towns support some commercial and industrial uses near the river, but the valley retains a primarily rural character, with farms, woodlands and scattered development seen in the broadening floodplain.

2.1.2 History

The Farmington River is the focal point for the long history of human settlement within the river corridor. While current residents of the riverfront towns may be less immediately dependent upon the river for water, power, food, or other resources than their predecessors, the communities retain the influence of their historic ties to the river.

Indications of the Valley's early native inhabitants are much less visible than those of later European settlers, but extensive archaeological remains have been documented along the Connecticut Study Segment in Peoples State Forest. Evidence indicates that the river valley harbored several permanent settlements as well as a major east-west travel route. Native tribes relinquished most of their property rights to the valley in a 1640 treaty that was bitterly contested. Small residual Native American populations remained in New Hartford and Riverton into the early nineteenth century, with a few believed to have resided in the valley as late as 1890.

Europeans first settled in the area in the early 1700's. These colonists initially used the valley primarily for agriculture, but they eventually harnessed the river for powering saw and grist mills, tanneries and other industries designed to process primary natural resources. The river's long history of impoundment for a variety of purposes began as early as 1750 with a

dam at Satan's Kingdom in the Town of New Hartford. The population of the river valley increased rapidly during the industrial revolution from 1820 to 1850, as iron foundries, paper mills, textile factories and other industries were introduced to the area. The resultant industrial pollution and deforestation of adjacent lands rapidly degraded the environmental quality of the river and surrounding corridor. By 1860, the river as far north as New Boston in Massachusetts was unsuitable for swimming, and formerly abundant salmon and trout were virtually absent.

In an abrupt reversal, the river valley experienced a general economic decline during the latter half of the 19th century as the small-scale agricultural and hydropowered operations became unable to compete with farms and industries in other regions of the country. As most of the local factories and mills closed, the local population declined sharply.

During the last century, the environmental quality of the river and the surrounding lands has undergone a remarkable recovery, to the point where the river is once again suitable for swimming and fishing. This dramatic improvement is the result of several factors, including the following: reduced industrial pressures; the implementation of strong environmental protection and restoration laws such as state and federal clean water statutes; and citizen activism, spearheaded since the 1950's by the Farmington River Watershed Association.

2.1.3 Demographics

Today, the upper Farmington Valley is characterized by small communities nestled in an otherwise rural, heavily forested region. All three of the towns adjacent to the Massachusetts Study Segment have populations of less than 1,000 year-round residents; seasonal inhabitants more than double the population of these towns. There are two primary factions among the year-round population in the Massachusetts towns: long-time residents, many of whom have family ties in the area dating back for generations; and relative newcomers, including many who have migrated from urbanized areas to take advantage of the natural setting and small-town environment of the Farmington Valley. Also, a significant percentage of the landowners in the Massachusetts towns are absentee owners, many having permanent residences in the New York City, Hartford, and Boston metropolitan areas and traveling to the Farmington Valley for weekends and vacations.

While sharing a small-town, rural feel with the Massachusetts communities, the demographic character of the Connecticut study area towns is influenced by their closer proximity to the Hartford urban area. The four towns through which the Connecticut Study Segment flows are within reasonable commuting distance of Hartford, which is located only twenty miles from the lower end of the segment. In combination with the area's rural character and high quality-of-life, this proximity has made the towns popular "bedroom communities" for people who work in and around Hartford. This is particularly true of the downstream-most towns, New Hartford and Canton, where many residents commute to jobs in the Hartford area. The populations of the four towns reflect this influence, increasing steadily as one moves downstream and gets closer to Hartford. Hartland, at the upstream end of the segment, has a population of only 1,700, while Canton, which abuts the lower mile of the segment, has a population of 8,250. The two towns in between, Barkhamsted and New Hartford, have populations of 3,200 and 5,300, respectively.[7]

The communities along the Connecticut segment support a broader local economic base — including a variety of service-based businesses and small industries — than the towns upstream in Massachusetts. Also, the populations of the Connecticut towns are generally more stable on a year-round basis than those of the Massachusetts communities, with a much smaller percentage of second home owners.

2.1.4 Land Ownership

One of the defining features of the upper Farmington Valley is the fact that most of the land is privately owned and has been that way for generations. A number of large parcels of public land (mostly in state forests) do exist in the study area in both Massachusetts and Connecticut, but more than half of the frontage along each of the study segments is in private ownership.[8]

Figure 2-1 provides an overview of land ownership patterns in the three towns that directly abut the Massachusetts Study Segment. Of the 150 individual lots immediately adjacent to the segment, the vast majority — 135 parcels — are in private ownership.[9] These private lands account for approximately 73 percent of the overall frontage along the Massachusetts segment. Most of the private lots abutting this stretch of the river are small residential parcels with less than 5 acres and 300 feet of river frontage. These smaller lots are clustered

[7] The population figures for the study area towns were gathered from existing records in 1989-90.

[8] For both the Massachusetts and Connecticut Study Segments, there are literally hundreds of individual properties located within the arbitrary 1/4-mile wide study corridor on each side of the river that is required by the Wild and Scenic Rivers Act. As a result, land ownership statistics were not gathered for the entire width of the study corridor. Instead, the analysis concentrated on identifying ownership patterns for the land that is of greatest importance to the river itself — those parcels that directly abut the two segments. Most of the information presented was collected in 1989-90. The statistics also reflect recent acquisitions made by the Massachusetts Department of Environmental Management (of the so-called Kelly, Earth Campground, and Hryckvich parcels), and the Connecticut Department of Environmental Protection (of the so-called Shaw-Gates and Ehrlich-Curtis properties). (Note that the arbitrary 1/4-mile wide corridor referenced above is for study purposes only, and has no bearing on long-term management considerations with or without wild and scenic river designation.)

[9] This total includes any parcel that abuts a road if that road is located directly adjacent to the river (i.e., if there are no other properties between the road and the river).

FIGURE 2-1
Land Ownership Along the Massachusetts Study Segment

Town [a]	Total Number of Parcels [b]	Total Number of Private Parcels	Total Private River Frontage (miles)	Total Number of Public Parcels	Total Public River Frontage (miles)
Otis	102	97	12.75	5	1.85
Sandisfield	41	35	5.31	6	3.29
Tolland	7	3	2.31	4	2.41
TOTAL	150	135	20.37 (73%)	15	7.55 (27%)

[a] Land ownership statistics are not presented for the Town of Becket because although the Town was represented on the Farmington River Study Committee and was active in the project, it does not encompass any river frontage directly on the Massachusetts Study Segment.

[b] Statistics presented include parcels that directly abut the Study Segment and those that abut roads along the river in cases where there are no other recognized parcels between the river and the road.

primarily in the village centers of Otis, New Boston and Roosterville. In between these more densely settled areas, there are a number of larger private lots with more than 50 acres and 1,000 feet of river frontage.[10]

A total of 15 parcels along the Massachusetts segment are held in public ownership, and account for the remaining 27 percent of the total frontage. The largest of these public lands are in the Otis, Sandisfield and Tolland State Forests, managed by the Massachusetts Department of Environmental Management (DEM). The Hartford Metropolitan District Commission and the U.S. Army Corps of Engineers also own and manage sizeable tracts along the lower end of the Massachusetts segment in conjunction with the West Branch Reservoirs, located a short distance downstream. (See **Subsection 2.2.3: Hydrology** for further information about the West Branch Reservoirs.) The final pieces of public land along the segment are small parcels owned by the Towns of Otis and Sandisfield and the Massachusetts Department of Public Works.

Figure 2-2 and **Map 2-1** provide further information on the public lands along the Massachusetts segment.

As shown in **Figure 2-3**, the ownership patterns along the Connecticut Study Segment are similar to those of the Massachusetts segment in that the majority of frontage on the river is privately owned but substantial tracts of adjacent public land also are present. There are 221 separate parcels along the segment, including 200 in private ownership that account for about 51.5 percent of the frontage. As in Massachusetts, the majority of private lots abutting the river in Connecticut are small residential parcels with less than 5 acres and 300 feet of river frontage. These smaller lots are primarily clustered in the community centers of Riverton, Pleasant Valley and New Hartford. Much of the area in between these communities is occupied by larger lots, a number of which contain more than 50 acres and 1,000 feet of river frontage.[11]

An important difference between the two segments is that there is nearly twice as much frontage in public ownership along the Connecticut segment (approximately 48.5 percent) as there is along the Massachusetts segment (27 percent). Most of the public land next to the Connecticut Study Segment is located in three state-owned parcels: the American Legion, Peoples, and Nepaug State Forests. These large tracts of state land, which are managed by the Connecticut Department of Environmental Protection, account for more than 27 percent of the entire frontage on the study segment. In addition, the Hartford Metropolitan District Commission owns several

[10] To give a more precise sense of the land holdings along the Massachusetts segment, 91 of the private lots abutting the river have less than 5 acres of land, and 58 lots have less than 300 feet of river frontage. On the other side of the spectrum, 19 private lots have more than 50 acres of land, and 31 lots have more than 1,000 feet of river frontage.

[11] 162 private lots abutting the Connecticut Study Segment have less than 5 acres of land, and 131 lots have less than 300 feet of river frontage. On the other side of the spectrum, 6 private lots abutting the segment have more than 50 acres of land, and 19 lots have more than 1,000 feet of river frontage.

FIGURE 2-2
Massachusetts Study Segment: Adjacent Public Lands

Managing Institution	Acreage	River Frontage (feet)	Percent of Total River Frontage
Massachusetts Dept. of Environmental Management	2,661	22,675	15.4
U.S. Army Corps of Engineers	138	11,500	7.8
Hartford Metropolitan District Commission	271	4,550	3.1
Massachusetts Dept. of Public Works [a]	3	274	0.2
Town of Otis	2	820	0.6
Town of Sandisfield	0.2	80	0.1
Town of Tolland	0	0	0
TOTAL	3,075.2	39,899	27.2%

[a] The land ownership figures for the Massachusetts Department of Public Works do not include several very narrow parcels owned by the agency that are located between Route 8 and the center of the Farmington River in Otis and Sandisfield. Acreage and frontage statistics for these parcels were not available.

sizeable parcels, including an important 366-acre floodplain area (the so-called 'Greenwoods' parcel) in the middle of the study segment, and three lots totalling 471 acres near the beginning of the segment in Hartland. Together, the MDC's parcels account for more than 20 percent of the segment's entire frontage. The remaining public lands are small parcels owned by the Towns of New Hartford and Canton.

Figure 2-4 and Map 2-2 provide further information on the public lands along the Connecticut segment.

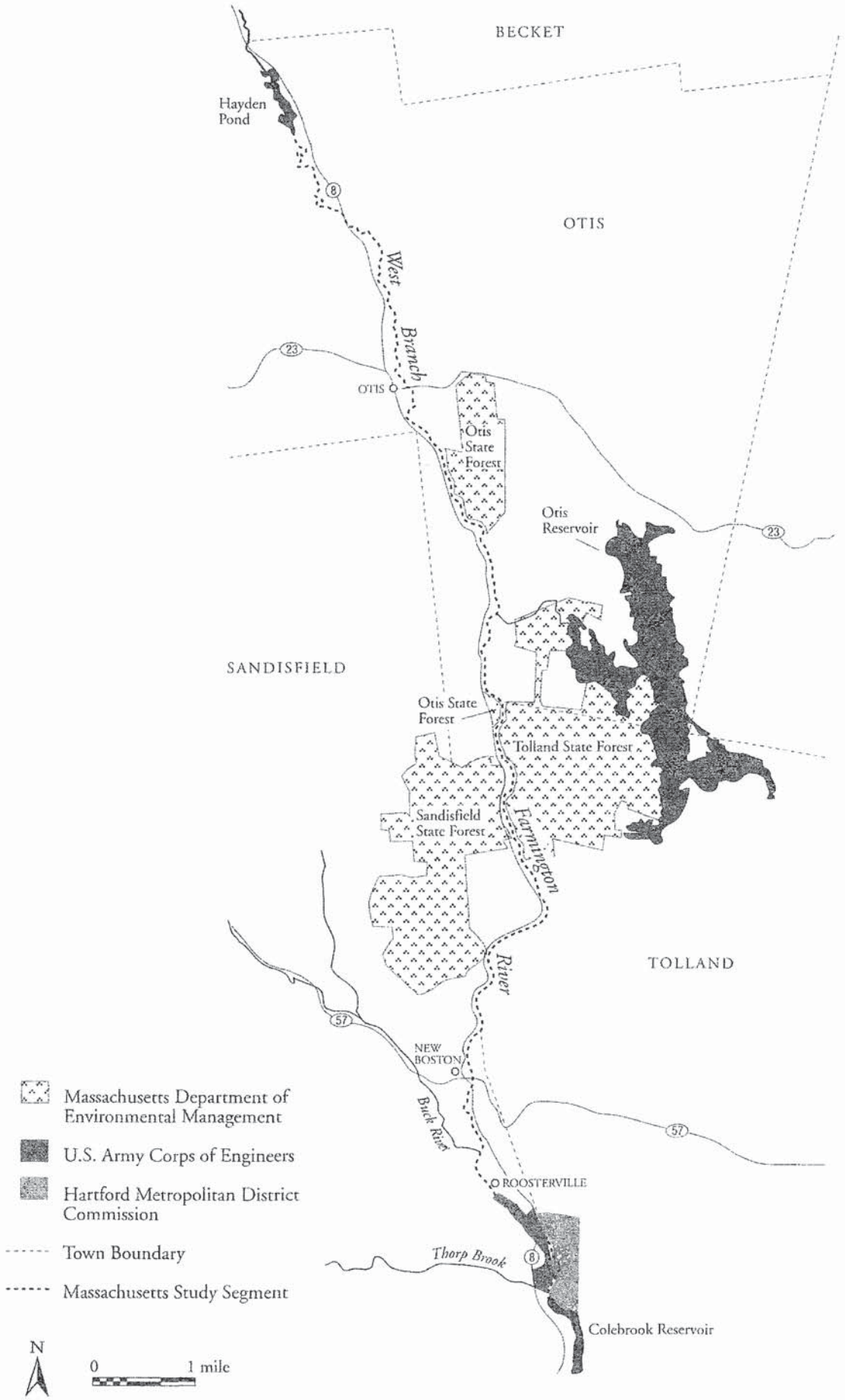
Additional details on the land ownership patterns along the two study segments, including town-by-town statistics, can be found in the Draft Evaluation of Existing Protection (June, 1990).

2.1.5 Land Use

The Massachusetts study area is characterized by extensive forests mixed with sparse development and overgrown farmlands. The development that does exist is concentrated in the historic river communities of Otis and New Boston/Roosterville (part of the Town of Sandisfield). The land between these communities consists largely of woodlands where limited timber harvest occurs. Only a few parcels adjacent to the river have been cleared, primarily for scattered single family residences, a few small farms and a lumber yard.

The northernmost half-mile of the Massachusetts segment is primarily wetlands and broad floodplain. The floodplain narrows downstream through most of Otis, but the valley remains fairly moderate with slopes and ridges set back from the immediate river corridor. In the lower half of the study segment, the river drops more rapidly and steep slopes generally descend directly to the river's banks. The east side of the river along most of the study segment is heavily forested with little road access. The west side of the river is more developed in the town centers, and Massachusetts Route 8 parallels the river on that side for most of the length of the segment. In New Boston, Route 8 crosses the river and runs parallel to it on the east side for one mile south to Roosterville. In this section, the eastern shoreline has relatively more development, primarily in the form of residential homes and small businesses, while the west side is largely undeveloped and forested. Below Roosterville, the valley floor broadens somewhat, and Route 8 crosses back over the river and then climbs up and away from the western shoreline. For the last half-mile of the Massachusetts segment, a little-used paved road (following the former

Map 2-1: Massachusetts Study Segment - Adjacent Public Conservation Lands



path of Route 8) parallels the west bank, but there is no other development nearby. Steep, heavily wooded hillsides and ridgelines set back from the river's immediate shoreline provide an impressive backdrop for this lower section of the segment.

The public lands that abut the river for a total of roughly seven and one-half miles in Massachusetts contribute significantly to the undeveloped character of much of the river corridor. Forestry on the state forests in the area has rebounded in recent years as secondary forests have reached harvestable age, but this activity has a negligible impact on the river. These lands also support a variety of recreational activities. The MDC and Army Corps lands along the downstream end of the segment are largely kept in a natural condition. Many of these public lands provide important public access for river-related recreation.

In the upstream portion of the Connecticut Study Segment, the land use pattern and intensity is similar to the Massachusetts Study Segment. Farther downstream, however, the broadened river valley accommodates a greater variety of land uses and, as mentioned earlier, a higher population and the edges of suburban growth extending from the greater Hartford area.

The lands along the upper two-thirds of the Connecticut segment are predominantly forested, with steep slopes often rising as much as 500 feet from the valley to mountain ridges and ledges. Two communities are located directly on this upper part of the study segment: the historic town center of Riverton, and, further downstream, the small village of Pleasant Valley. These communities, both located within the Town of Barkhamsted, are primarily residential with some small businesses. Riverton is home to many historic structures, including the original Hitchcock Chair Factory, the Old Riverton Inn, and the Union Church. Riverton also hosts the annual Riverton Fair each October. This event, which has been a regional institution since the turn of the century, is held on fairgrounds located just upstream from the confluence of the West Branch and the Still River.

Two state forests (American Legion and Peoples State Forests) and several large parcels of land owned by the Metropolitan District Commission abut this stretch of the river and contribute significantly to the area's undeveloped character. The state forests are managed for multiple uses, including recreation, wildlife habitat, and harvest of firewood, mountain laurel, and saw timber. Forestry operations have not had a noticeable effect on the river. MDC lands along the river also are managed for multiple uses, with more intensive uses such as timber harvest and sand and gravel removal generally isolated from the immediate river corridor. The MDC's shorelands areas — particularly the "Greenwoods" parcel in Barkhamsted and New Hartford — are managed largely for resource conservation and provide important public access to the river. The MDC has developed a handicapped fishing access site at the Church Pool in Pleasant Valley through a cooperative effort with the DEP and the Farmington River Anglers Association.

FIGURE 2-3
Land Ownership Along the Connecticut Study Segment

Town [a]	Total Number of Parcels [b]	Total Number of Private Parcels	Total Private River Frontage (miles)	Total Number of Public Parcels	Total Public River Frontage (miles)
Hartland	14	9	1.0	5	2.3
Barkhamsted	95	91	4.6	4	7.4
New Hartford	94	84	6.9	10	3.1
Canton	18	16	1.13	2	0.03
TOTAL	221	200	13.63 (51.5%)	21	12.83 (48.5%)

[a] Land ownership statistics are not presented for the Town of Colebrook because although the Town was represented on the Farmington River Study Committee and was active in the project, it does not encompass any river frontage directly on the Connecticut Study Segment.

[b] Statistics presented include parcels that directly abut the Study Segment and those that abut roads along the river in cases where there are no other recognized parcels between the river and the road.

FIGURE 2-4
Connecticut Study Segment: Adjacent Public Lands

Managing Institution	Acreage	River Frontage (feet)	Percent of Total River Frontage
Connecticut Dept. of Environmental Protection [a]	4,760	38,467	27.5
Hartford Metropolitan District Commission	927	28,600	20.4
Town of Hartland	0	0	0
Town of Barkhamsted	0	0	0
Town of New Hartford	5	885	0.6
Town of Canton	2	0	0
TOTAL	5,694	67,952	48.5%

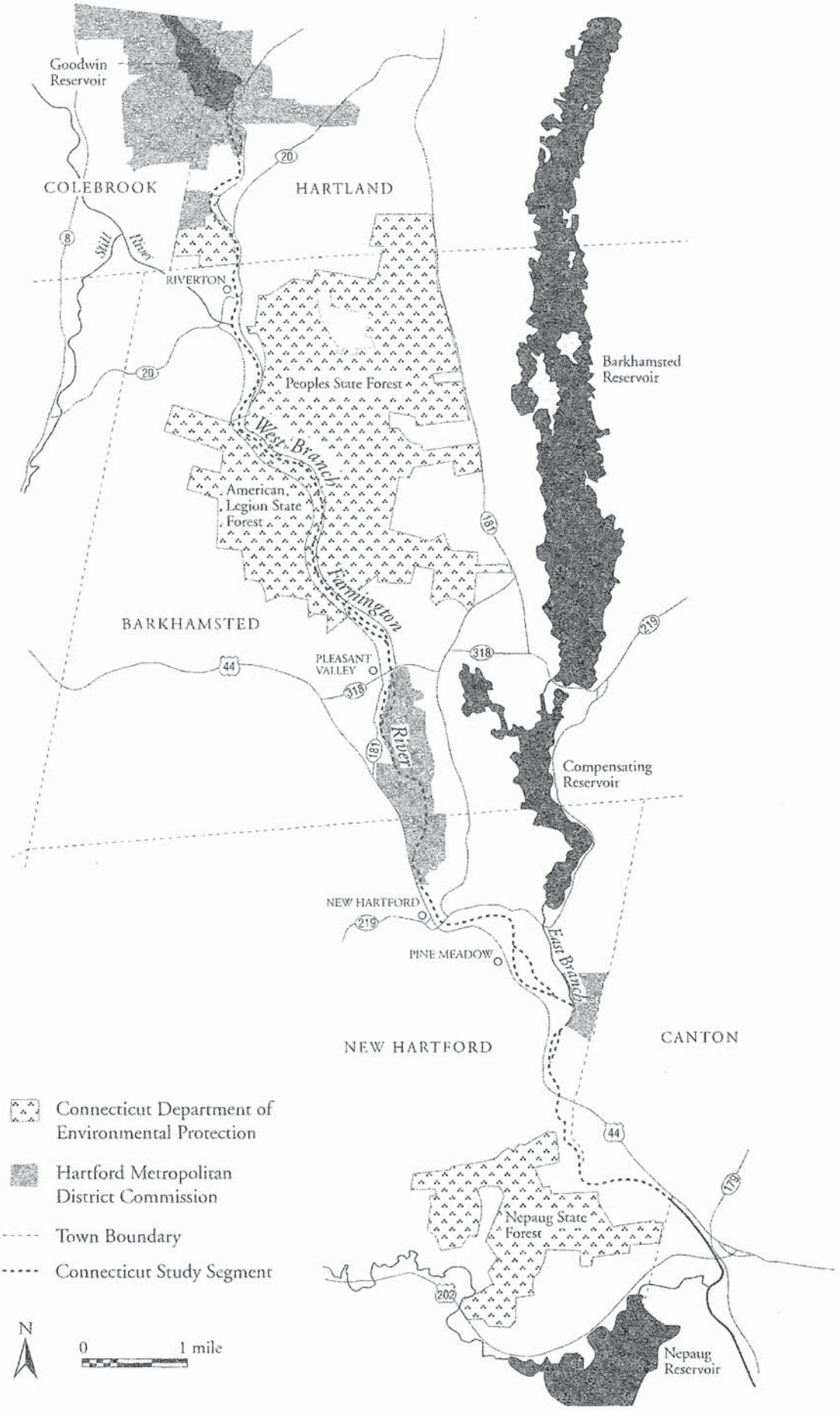
[a] The statistics for river frontage managed by the Connecticut DEP do not include 10-foot wide permanent easements for public fishing access that the agency holds on several parcels in Hartland, Barkhamsted, and New Hartford. These easements were purchased in the 1950's and '60's by the Connecticut Department of Fish and Game, which subsequently became part of the DEP. Statistics on the precise amount of frontage covered by these easements are not available.

While the lower third of the study area in Connecticut is somewhat more developed, the river is generally bordered by vegetated shorelines that maintain a natural appearance and function. The town center of New Hartford is the largest settlement along either of the study segments. Most of the development in the town — including residential areas and a strip commercial zone with several small businesses and light industries — is concentrated on the west side of the river in a two-mile long section. However, even in this area most of the development is set back from the immediate shoreline and does not have a significant effect on the river corridor's natural character. The east bank of the river in New Hartford remains largely forested and undeveloped.

An important public access site — the state-owned "Satan's Kingdom Recreation Area" — is located on the west bank near the southern end of New Hartford, a short distance above the gorge bearing its name. The study segment continues downstream for an additional two miles. With Nepaug State Forest bordering its west side for much of this lower stretch, the river corridor retains a largely natural character, although a few houses can be seen set back from the east bank in the last quarter mile of the segment.

For most of its length, the Connecticut Study Segment is paralleled on one or both sides by low-speed public roads that alternately follow along the shoreline or pull out of sight of the river into dense forests or small hamlets. Connecticut Route 44 also parallels the west side of the river at varying distances through most of New Hartford, then crosses the river on a high bridge just upstream from the gorge at Satan's Kingdom. After the bridge, this two lane highway retreats from the river for approximately one mile before coming back in next to the east bank at the downstream end of the segment. In addition to the state forests and other public sites on the river, the adjacent roads provide good access to the river for fishermen and other recreationists.

Map 2-2: Connecticut Study Segment - Adjacent Public Conservation Lands



The study area is characterized by rolling, heavily forested hills, such as those seen here along the lower part of the Massachusetts Study Segment.

2.2 Natural and Cultural Resources

2.2.1 Geology

The West Branch and upper mainstem of the Farmington River are located in the New England uplands, an area characterized by low, steep sided hills broken by narrow winding river valleys with extensive outcroppings of erosion-resistant rock. Elevations range from 1,000 to 2,000 feet above sea level.

The Farmington River basin consists of bedrock materials and overlying glacial deposits of stratified drift and till. Within the study area, the bedrock is made up of metamorphic rock, including gneiss, schist phyllite and other minor amounts of crystalline rocks. This bedrock is relatively hard and impermeable to water, resulting in a sharply carved river valley dissecting the poorly drained, more level upland topography.

Glaciers played a large role in shaping this area by flattening the peaks, widening the valleys, and leaving behind significant deposits of glacial debris, which obstructed the river's north-to-south flow and forced it to turn north along Talcott Mountain. Extensive deposits of stratified drift and till (which include gravel, sand, silt and clay) were left during the last retreat of glaciers from southern New England. Stratified drift deposits averaging 100 feet in depth cover 22 percent of the Farmington Basin, and provide productive groundwater aquifers. Unsorted tills cover 75 percent of the basin. These deposits form an essentially impermeable mantle over the bedrock and, therefore, do not support significant aquifers. Also, extensive sand and gravel deposits are found in many locations along the river.

2.2.2 Vegetation

The dominant vegetation along the upper Farmington River is a mixed hardwood-hemlock-white pine forest. As the river flows 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. Within the river valley, marshes, bogs and agricultural development are also significant components of the surrounding vegetation.

A variety of plant species that are more common in northern New England reach the southern limits of their distribution in this region. The Massachusetts Study Segment and surrounding Berkshire County host over 40 percent of the entire Massachusetts flora, with 30 species found only in the county. Both study segments provide habitats for plant species identified as rare or endangered by either the Commonwealth of Massachusetts or the State of Connecticut. Although detailed plant inventories have not been conducted specifically for the Farmington Valley, the State of Connecticut lists

15 State Endangered, 12 State Threatened, and 20 State Special Concern (SSC) Species within the study area. The Commonwealth of Massachusetts identifies an additional nine species.

2.2.3 Hydrology

The 81-mile long Farmington River drains a watershed of 601 square miles, making it the largest tributary of the Connecticut River in the State of Connecticut and the Connecticut River's fourth largest tributary overall. Discharge data at the river's mouth in Windsor are not available due to the lack of a gaging station there; however, records have been kept during the periods from 1913-1939 and from 1971-1993 at the Tariffville Gaging Station, located approximately 11.6 miles upstream from the confluence with the Connecticut River and encompassing a 577-mile drainage area. The average discharge of the river at the Tariffville Gage is 1239 cubic feet per second (cfs), with an instantaneous peak flow of 29,900 cfs recorded on September 22, 1938, and an instantaneous low flow of less than 30 cfs estimated on March 1, 1938.[12]

Seven dams and associated impoundments are located directly on the West Branch and main stem of the river. The second most northerly of these, a small dam that forms Hayden Pond in North Otis, marks the upstream extent of the Massachusetts Study Segment. Continuing downstream, two sizeable dams and impoundments — the Goodwin Dam/Reservoir and the Colebrook Dam/Reservoir (collectively known as the "West Branch Reservoirs") — are located between the two Wild and Scenic River Study Segments.[13] The other dams on the main stem are the Upper and Lower Collinsville Dams in Canton, located approximately 4 and 5 miles respectively downstream of the Connecticut Study Segment, and the Rainbow Dam near the river's mouth in Windsor.

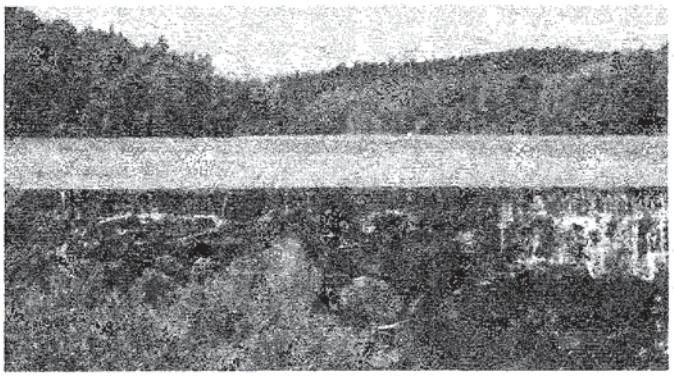
Dams also have been constructed on many of the tributaries to the West Branch and main stem in both Massachusetts and Connecticut. In the Massachusetts portion of the watershed, there are approximately 25 dams in addition to the one at Hayden Pond. There are approximately 66 dams with impoundments greater than 5 acres located within the watershed in Connecticut. Water from impoundments on two of the Farmington's major tributaries in Connecticut, the Nepaug River and the East Branch, is transferred out of the basin to provide public water supply for the greater Hartford area.

[12] The maximum discharge figures recorded at the Tariffville Gaging Station are somewhat misleading because the station was not operational in August of 1955, when extreme high flows were recorded at gaging stations throughout the Farmington River basin. In fact, several stations located in the upper reaches of the basin (and thus having much smaller drainage areas) recorded flows at that time that were themselves substantially greater than the 29,900 cfs maximum discharge recorded at the Tariffville Gage during its operational periods.

[13] The Goodwin Dam/Reservoir is also known as the "Hogback" Dam/Reservoir. The Colebrook Dam/Reservoir is often referred to technically as the "Colebrook River" Dam/Reservoir.

Map 2-3 depicts the Farmington River watershed, including the main stem and principal tributaries, the locations of the major dams and impoundments, and the watershed boundary.

The dams and impoundments dotting the Massachusetts portion of the watershed have a relatively minor effect on day-to-day flows in the Massachusetts Study Segment. On the other hand, regulated releases from the West Branch Reservoirs have a substantial effect on river flows in the Connecticut Study Segment, which begins immediately downstream from the Goodwin Dam. Additional information on legal and statutory requirements and other factors affecting flow management in each segment is provided in **Chapter 4: Resource Management and Protection**.



The low-head Hayden Pond Dam forms the upstream boundary of the Massachusetts Study Segment. Releases from this dam provide most of the water in the upper part of the segment.

The Massachusetts Study Segment includes a total of 14 river miles, almost all of the Farmington's West Branch in Massachusetts. (The true headwaters of the West Branch — which include wetland areas, several small feeder streams, a waterbody known as Shaw Pond, and a short section of the West Branch itself — are located upstream of the study segment, but were not included directly in the study area. Hayden Pond and the dam that creates it separate this upstream area from the study segment.) There are 16 direct perennial tributaries to the segment, the largest of which is the Buck/Clam River system that flows in from the northwest and joins the West Branch in Sandisfield. The watershed of the Massachusetts Study Segment covers an area of 92 square miles.

Flows from the low-head Hayden Pond Dam provide most of the water in the upper part of the Massachusetts segment, but are not adjusted on a regular basis. Of the 25 other dams in the watershed of the Massachusetts Study Segment, there is one that periodically exerts a particularly notable influence on flows in the West Branch — the Otis Reservoir Dam, which creates a sizeable impoundment on the Fall River. A substantial amount of water is released from this dam during a two week period each fall, providing a pulse of water in the West Branch at a time of year when it is usually flowing at very low levels. Several of the remaining dams on tributaries to the West Branch are dry dams managed by the U.S. Soil

Map 2-3: The Farmington River Watershed

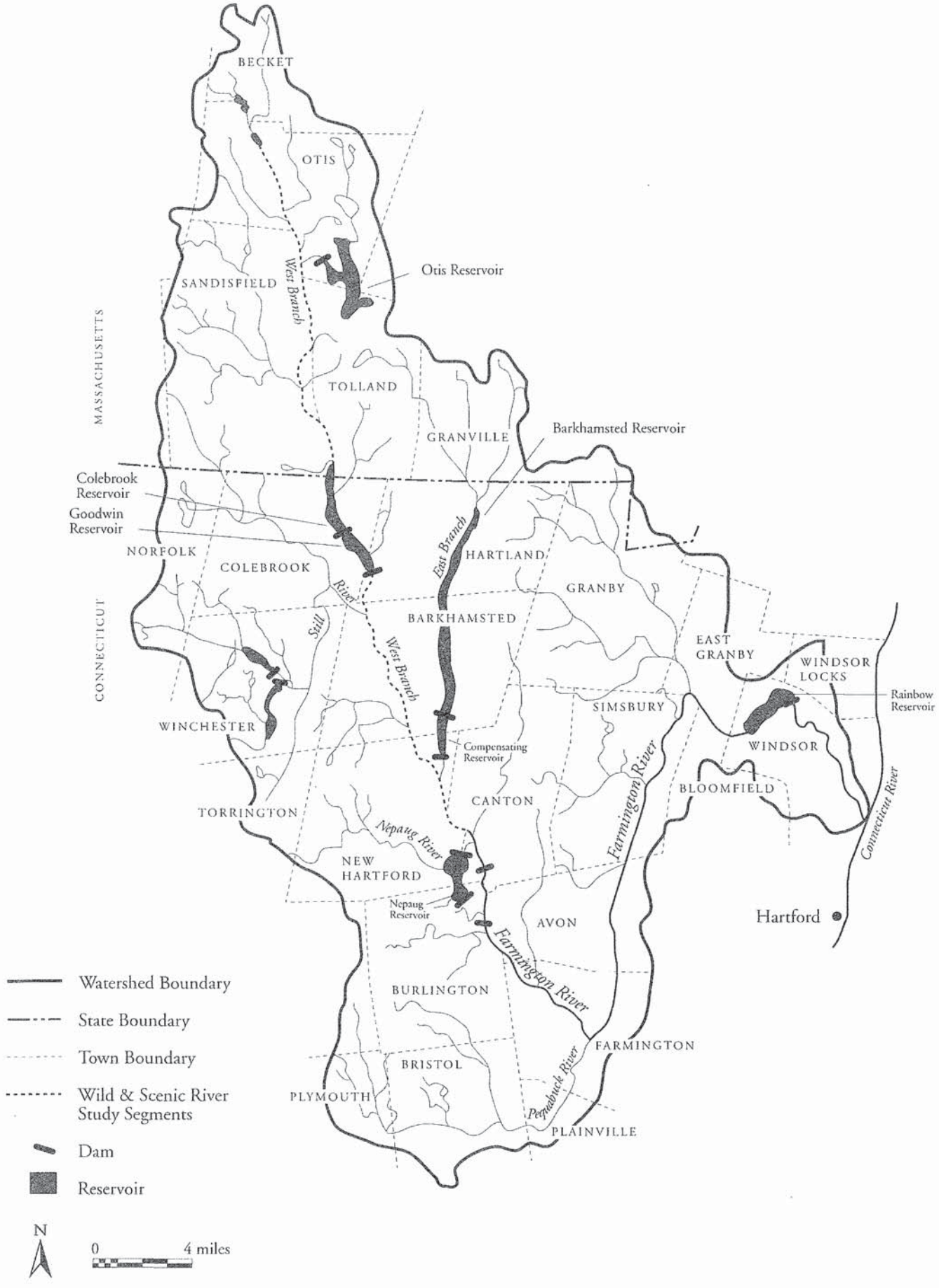
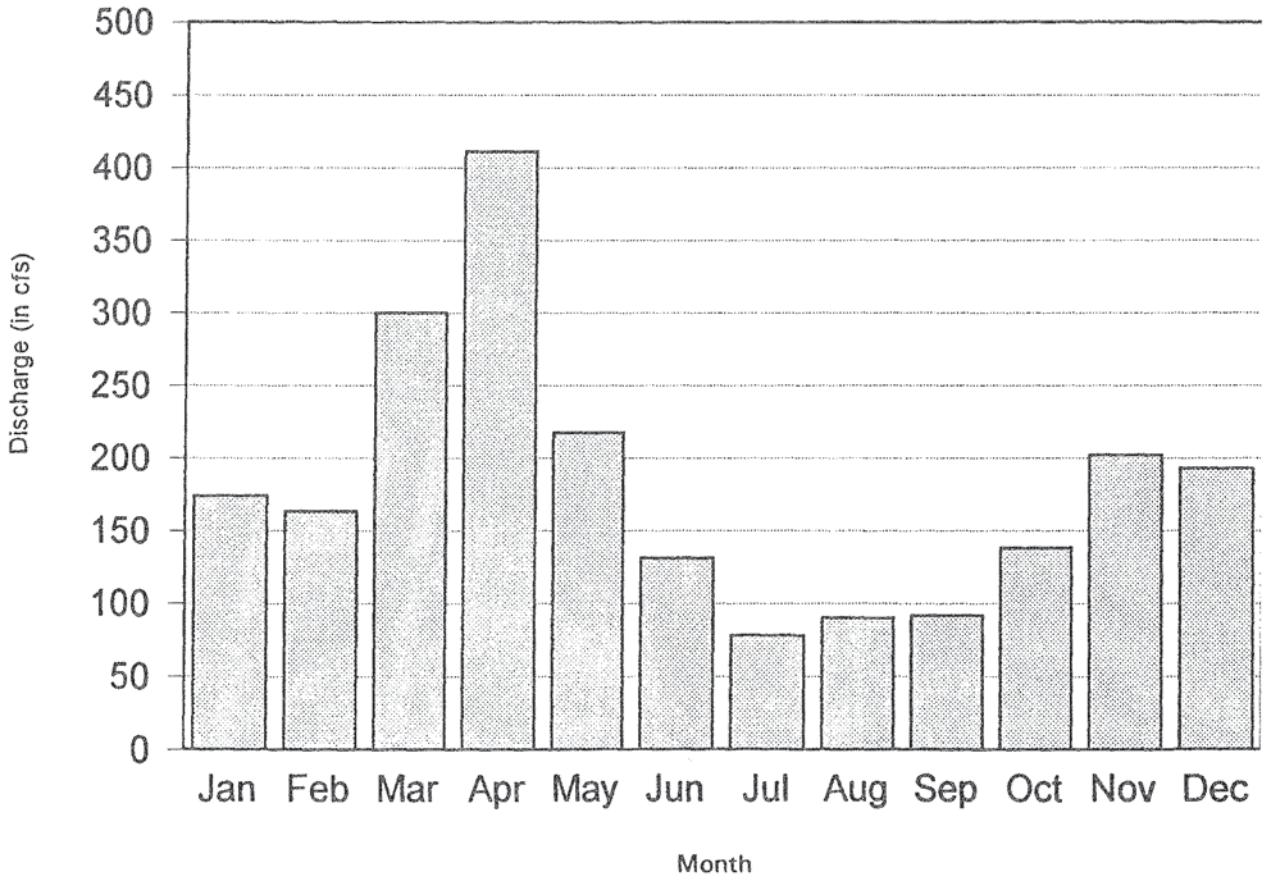


FIGURE 2-5
Average Monthly Discharge of the Massachusetts Study Segment [a]



[a] Measurements recorded at the U.S.G.S. gaging station in Roosterville, one mile south of New Boston, from 1913-1993.

Conservation Service for flood control. These structures impound water only during periods of extremely high flow, and then only for a limited time. The dry dams therefore cause some short-term reductions in West Branch flows during wet periods, but generally do not affect flow volumes on a year-to-year basis.

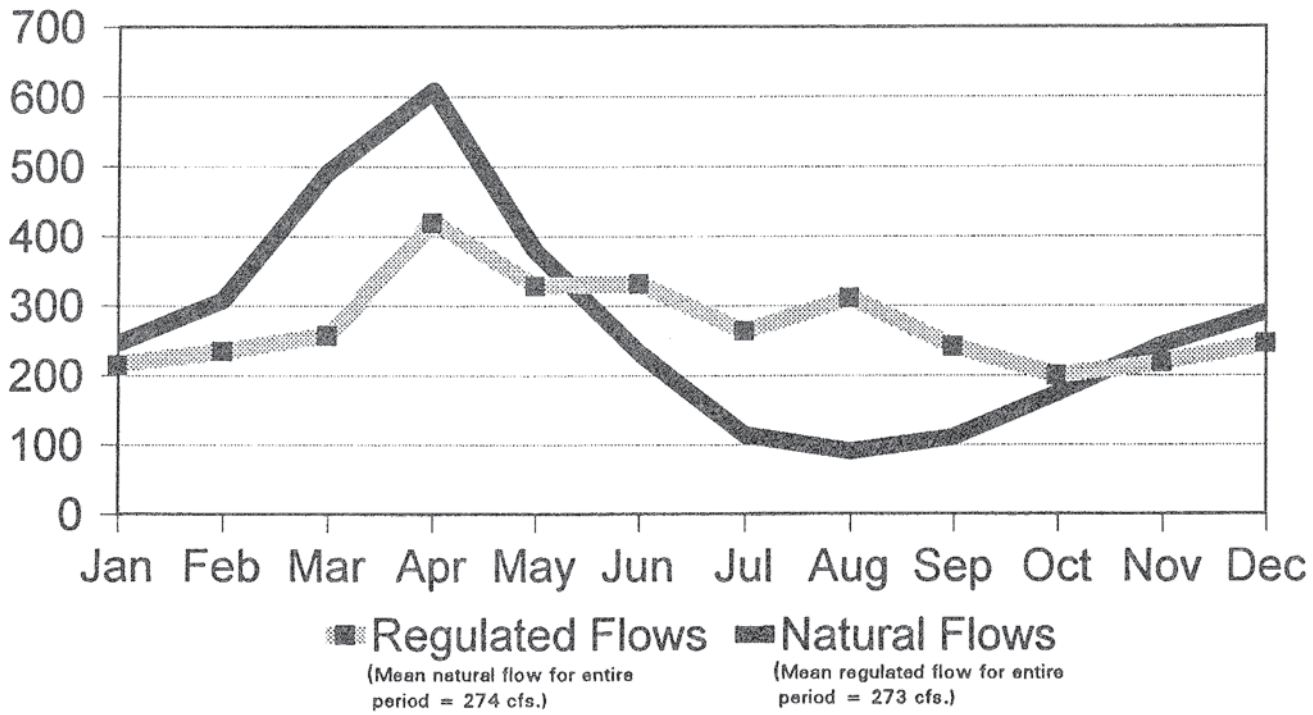
While releases from Otis Reservoir and the other impoundments in the watershed do have some effect on flows in the Massachusetts Study Segment, this stretch of the river is by and large naturally flowing and is very responsive to local weather patterns and snowmelt. As shown in Figure 2-5 below, the annual hydrograph for the segment is characterized by moderate flows during the late fall and winter months, peak flows resulting from snowmelt and rain in the spring, and lowest flows during the drier months of summer and early fall. The average flow in the segment is 182 cubic feet per second, with a instantaneous peak flow of 34,300 cfs recorded on August 19, 1955 and a minimum daily flow of 2.4 cfs recorded on August 20, 1957.[14, 15]

The Connecticut Study Segment also covers a total of 14 river miles. The segment includes all of the West Branch within the state, and the uppermost 3 miles of the main stem below the confluence of the West and East Branches in New Hartford. There are 18 direct perennial tributaries to the

[14] These measurements were recorded over the period from 1913-1993 at the U.S.G.S. gaging station in Roosterville, approximately 1-1/2 miles above the downstream end of the Massachusetts Study Segment.

[15] The average volume contributed to flows in the West Branch by releases from Otis Reservoir is not certain because long-term measurements of discharges from the Otis Reservoir Dam are not available. However, based on estimates from other gaging stations at locations in the Farmington River watershed in Massachusetts with similar topography, an annual watershed yield of approximately 2 cfs per square mile can be expected. With a total watershed area of 15.9 square miles above the Otis Reservoir Dam, this suggests an estimated average yield over the course of a year of roughly 32 cfs.

FIGURE 2-6
Average Monthly Regulated (Actual) Flows vs. Average Monthly Natural (Calculated) Flows in the Connecticut Study Segment



[a] Average monthly natural flows are projections at Riverton based on changes in the levels of the Otis, Colebrook and Goodwin Reservoirs (i.e., projections simulate natural conditions if the dams/reservoirs did not exist).

[b] Average monthly regulated flows are based on readings from Jan. 1970 - Sept. 1988 at the Riverton Gage Station and are estimated to be 9% greater than Goodwin Dam releases due to 9% greater watershed area at Riverton than at Goodwin Dam.

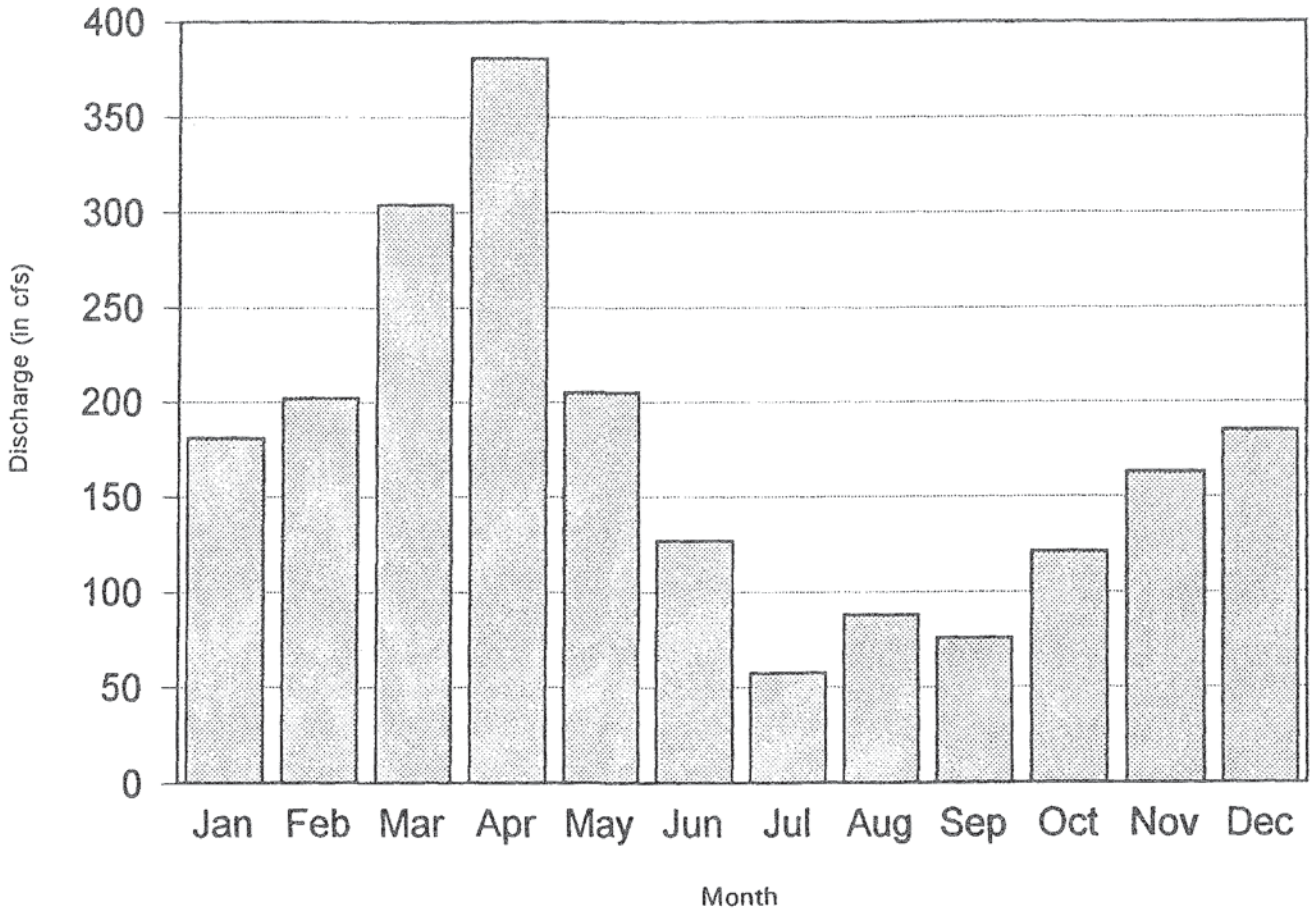
[c] All data from U.S. Geological Survey

segment, the largest being the Still River/Sandy Brook system, which enters from the northwest in Riverton. The Connecticut Study Segment drains an overall area of approximately 310 square miles.

Instream flows in the Connecticut segment are significantly affected by releases from the West Branch Reservoirs through the Goodwin Dam. In fact, these releases account for virtually all of the water in the river for the first two and one-half miles of the study segment, down to the confluence with the Still River in Riverton. Although the pattern of releases from the West Branch Reservoirs has not significantly altered the annual average flow in the river, it has flattened out seasonal variations by reducing high flows during the spring and other wet periods, and increasing low flows during the late summer and other dry periods.[16] A comparison of the actual regulated flows released from the Goodwin Dam and projected natural flows (as if the dams did not exist) for the period from 1970-1990 is presented above in Figure 2-6.

[16] Augmented summer flows have enhanced conditions for canoeing, tubing and fishing in the river during summer months. In addition, releases from the West Branch Reservoirs are considerably colder than normal summer river temperatures would be, making the river within the Connecticut Study Segment more suitable for cold water fisheries. These benefits of flow regulation are addressed in **Subsection 2.2.5: Fish** and **Subsection 2.2.6: Recreation**, as well as in **Chapter 3: Eligibility and Classification**. Possible ecological consequences of reduced spring flows are not fully understood; however, there is general agreement that a limited duration high "flushing flow" is necessary to prevent the unhealthy accumulation of fine grained sediments in the streambed. This issue is discussed in greater detail in the summary of the "Instream Flow Study" in **Chapter 5: Water Resources Studies**, and in the description of standards for water quantity in **Chapter 7: The Upper Farmington River Management Plan**.

FIGURE 2-7
Average Monthly Discharge in the Still River [a]



[a] Measurements recorded at the U.S.G.S. gaging station on the lower Still River, approximately one mile upstream from its confluence with the West Branch of the Farmington River, from July 1948 - September 1967 and July 1969 - September 1993.

The average flow in the West Branch above the confluence with the Still River is 251 cfs, with an instantaneous high flow of 57,200 cfs on August 19, 1955 (estimated by slope-area measurement) and an instantaneous low flow of 0.9 cfs recorded in July, 1960.[17]

Besides releases from the West Branch Reservoirs, inflow from the Still River/Sandy Brook system provides the single largest contribution to flows in the Connecticut Study Segment. The watershed of this system alone covers an area of 85 square miles. The annual average inflow from the Still River is 173 cfs, with an instantaneous peak flow of 44,000 cfs recorded on August 19, 1955, and instantaneous low flow of 0.20 cfs recorded on September 14, 1957.[18] Many of the streams in the Still River watershed — including the Sandy Brook system — have not been impounded; as a result, flows in the lower Still River are very responsive to local weather patterns and snowmelt. (See Figure 2-7.)

No gaging stations are located near the lower end of the Connecticut segment; recorded measurements of flow levels in this area therefore are not available. However, an understanding of the river's flow patterns can be gained by looking

[17] These measurements were recorded over the period from 1955-1993 at the U.S.G.S. gaging station in Riverton, located approximately one-quarter mile upstream from the confluence with the Still River. The reader should note that the maximum flow, recorded in 1955, occurred prior to the construction of the West Branch Reservoirs, and the lowest flow, recorded in 1960, occurred during the construction of the Goodwin Dam.

[18] These measurements were recorded over the periods from July, 1948-September, 1967 and July 1969-1993 at the U.S.G.S. gaging station on the lower Still River, located roughly one mile upstream from its confluence with the West Branch.

collectively at the historical data presented above for the West Branch in Riverton and the Still River. Additional information on flows in the Connecticut segment can be found in the discussion of the Instream Flow Study in **Chapter 5: Water Resources Studies**, and in the report An Instream Flow Study of the Mainstem and West Branch of the Farmington River (June 1992), which is published separately as a companion to this document.

2.2.4 Water Quality

Water quality in both study segments is very high; the river is suitable for swimming and cold water fisheries throughout both study areas. The Farmington's high water quality is a major success story in ecological restoration. In the past century, the river has evolved from a pollutant-ridden channel carrying untreated effluent from adjacent towns, mills and other industries, into one of the cleanest rivers in the region.

The Massachusetts Department of Environmental Protection (MassDEP) has classified the entire length of the Farmington in the Commonwealth as class B (fishable and swimmable). There are no sewage treatment plants, industrial wastewater facilities or other point sources of pollution on the river. Current and anticipated water quality problems in the area are primarily related to non-point source pollution from septic systems and road runoff. MassDEP has adopted an "anti-degradation" standard to ensure protection of the river's existing high water quality.

Water quality in the Connecticut Study Segment is also high. The Farmington has been classified by the Connecticut DEP as Class A (suitable for drinking water supply) from the Goodwin Dam downstream to the confluence with the Still River, and as Class B from that point downstream to its confluence with the Connecticut River. There are four point source discharges that affect the Connecticut segment: 1) the Winsted Sewage Treatment Plant on the Still River; 2) the Atlantic salmon rearing facility in Peoples State Forest; 3) the New Hartford Sewage Treatment Plant; and 4) Waring Products in New Hartford. Effluent from these facilities is treated sufficiently to maintain Class B standards. In fact, even with these discharges the water quality in the Class B section of the Connecticut Study Segment is higher than the minimum standards required for Class B waters, as shown by the relatively high levels of dissolved oxygen and low levels of nutrients, ammonia, and other indicators. This higher water quality is protected by a strict "anti-degradation" policy for the river established by the DEP under the federal Clean Water Act and Connecticut's Water Pollution Control Statutes.

Additional information on the laws, regulations and policies that protect the Farmington's high water quality can be found in **Chapter 4: Resource Management and Protection**, and **Chapter 7: The Upper Farmington River Management Plan.**

2.2.5 Fish

The Farmington River's diverse aquatic habitats and high water quality support 37 native and introduced species of fish. At least seventeen of these have been identified within the Wild and Scenic River Study Segments. Fisheries management has focused on the propagation of three species of trout (brown, brook and rainbow) for sport fishing in both study segments, and on the reintroduction of Atlantic salmon to the Connecticut segment. Although recreational fishing in both areas is largely oriented toward catching stocked trout, several other sport fish, including bass, are found in the study segments.

The Farmington is one of the few remaining unpolluted trout streams in southern New England and is the most heavily stocked stream in Connecticut. Annually, over 42,000 trout are stocked in the entire Farmington River in Connecticut; about 28,000 of those fish are put into the Connecticut Study Segment. The Massachusetts Study Segment is stocked with approximately 9,400 trout each year.

The portion of the Farmington River system in Connecticut also provides some of the most critical habitat in southern New England for the restoration of anadromous fish, particularly Atlantic salmon. In fact, the Farmington and its tributaries provide an estimated 9 percent of the salmon nursery habitat found within the entire 11,250-square mile watershed of the Connecticut River, the largest of sixteen river systems included in the long-term program to restore anadromous species in New England. This major undertaking, begun in 1967, is a cooperative effort relying on important contributions from federal, state, and local governments and private organizations. Through 1986, it was estimated that over $75 million had

The Farmington River is a critical component in the effort to restore Atlantic salmon to the Connecticut River basin. Returning salmon are captured at the Rainbow Dam and transported upstream for spawning at a facility in People's State Forest.

been invested in fish passageways, a major fish hatchery, research, and operational programs in the Connecticut River watershed. In the early 1980's, the Connecticut was identified as one of only four river systems in the program that was projected to reach its restoration potential within the next twenty-five years.

The Connecticut DEP began releasing immature salmon in the Farmington in 1976, and has carefully monitored and artificially spawned returning adults since 1978. Currently, returning adult salmon are captured at the Rainbow Dam near the mouth of the river in Windsor, then transported upstream for spawning in holding ponds at a facility located adjacent to the Connecticut Study Segment. Nursery-raised fry and smolts are released into the study segment, tributaries and lower segments of the river for their downstream migration. In 1994, approximately one million newly hatched fry were released into the Connecticut Study Segment and its tributaries. The high survival and growth rates of the released fish suggest that the river will be able to support natural reproduction.

Although the number of returning adults has been relatively low to date (averaging about 38 fish per year since 1978, with a low of 6 individuals in 1984 and a high of 126 in 1987), the consistent annual return of even relatively few fish bodes well for the eventual success of the program. It is estimated that the Farmington River can sustain a naturally spawning population of 770 adult salmon (roughly 17 percent of the entire projected spawning population of the Connecticut River basin), with an annual sport harvest of 255 fish. In 1982, the U.S. Fish and Wildlife Service estimated 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 desired spawning populations.

Upstream and downstream fish passage facilities at the existing main stem dams are critical for the long-term success of the restoration program. A fish ladder for upstream passage has been established at Rainbow Dam, and the Farmington River Power Company (which operates the dam) has recently installed a downstream passage facility. The only remaining obstructions to anadromous fish migration to the Connecticut Study Segment are the Upper and Lower Collinsville Dams, located a few miles downstream of the segment's terminus in Canton. There is currently a proposal to reestablish hydroelectric facilities at both of these dams, and the DEP and the U.S. Fish and Wildlife Service have mandated that construction of the projects must be accompanied by establishment of adequate facilities for both upstream and downstream fish passage. The anadromous fish restoration plan does not envision fish passage upstream of the Goodwin Dam.

The high habitat value of the Connecticut Study Segment for Atlantic salmon and trout has been enhanced by the managed, coldwater releases from the Goodwin Dam since its completion in 1960. In particular, releases of water from the bottom of the Goodwin Reservoir throughout the summer and early fall provide higher instream flows of colder water than would be found in the river under natural conditions. These managed conditions help to sustain the Farmington's abundant trout population during what would otherwise be the most stressful time of year, and enable the DEP to continue its stocking program throughout the summer season.

2.2.6 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 segments identified the presence of 239 species of amphibians, reptiles, birds and mammals in the river corridor. This wealth of biological diversity is particularly noteworthy given the river's proximity to the heavily developed eastern seaboard.

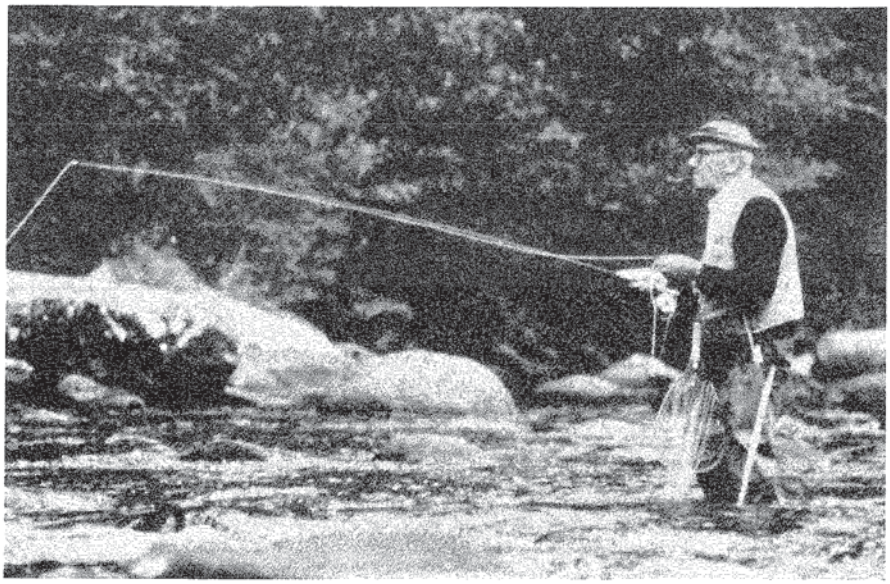
The Farmington's avifauna is extremely diverse, with 158 species observed within the study areas. This total, which amounts to more than half of all bird species found in Connecticut, includes 117 species that breed in the area. The region's range of habitats accommodates forest dwellers, colonial marsh nesters, raptors, wading birds and water fowl. Game birds are commonly seen and hunted along the river. Several duck species, Canada geese, ruffed grouse, and woodcock all nest within the area. Wild turkey have been successfully reintroduced throughout a broad range that includes the Connecticut study area, with the first hunting season held in 1981. In addition, a variety of locally rare raptors occur along both study segments.

The Connecticut segment is particularly noteworthy for a population of bald eagles, a federally listed endangered species, that has reestablished a year-round presence in the area. While much of the birds' activity has been centered in the protected watershed of the Barkhamsted Reservoir, they regularly feed on fish in the upper Farmington River, particularly in the winter when the reservoir is frozen. In recent years, the Connecticut DEP, the Hartford MDC, and the U.S. Fish and Wildlife Service have worked cooperatively to support, protect and monitor the eagles' activity. These efforts reached a milestone in May 1992, when a pair of eagles that had been nesting near the reservoir successfully hatched two chicks — the first born in Connecticut in more than 40 years.

The Connecticut Study Segment also provides habitat for many birds listed by the State as Endangered, Threatened, or Special Concern, which are species that occur in small numbers or are undergoing a non-cyclic decline. These species include the great blue heron, the cliff swallow, the great egret, the bald eagle, the northern parula warbler, the savannah sparrow, and the osprey.

An historic peregrine falcon aerie within the corridor of the Massachusetts Study Segment is considered the best potential natural nesting habitat for returning peregrine falcons in the

entire state of Massachusetts. 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 Commonwealth of Massachusetts considers protection of the Farmington aerie to be "extremely important" for the recovery of peregrine falcons in New England.



Anglers from across the Northeast and beyond journey to enjoy the Farmington's renowned trout fishing. The Connecticut Study Segment receives the heaviest use of any section of the river.

Forty-nine species of mammals have been documented within the study area, including locally rare species such as the black bear, deer mouse, fisher, snowshoe hare, and cottontail rabbit. White-tailed deer are ubiquitous and hunted in the state forests adjacent to both the Massachusetts and Connecticut study segments. Over 400 deer are harvested annually on state lands abutting the Massachusetts Study Segment, representing 8 percent of the annual harvest in the state. Several riverine mammals, including river otter, beaver, mink, fisher and muskrat, are found in the study segments and are increasing in population as a result of improved water quality. Nearly all of the fur bearing species are trapped in limited quantities.

The study segments are home to 32 species of amphibians and reptiles. Approximately two-thirds of these species, including the Connecticut State Threatened northern spring salamander, are directly linked to the aquatic and semiaquatic habitats in and around the river.

The Massachusetts Study Segment is also home to a population of state-endangered swollen wedge mussel (*Alasmidonta varicosa*). The presence of these mollusks, which are highly sensitive to environmental degradation, is indicative of the unpolluted, high quality habitat found in the segment. The Farmington population of these mussels is one of only four extant populations documented in the Commonwealth.

2.2.7 Recreation

The Farmington River supports tremendous recreational use. In Massachusetts, the most noteworthy recreational opportunities are white water boating and good fishing for stocked trout. In Connecticut, trout fishing, boating, and tubing all are highly popular, attracting an estimated 25,000 fishing trips, 30,000 tubers, and thousands of boaters each year. The Farmington is widely recognized as one of New England's premier trout streams, and draws anglers from throughout the Northeast. Over 40 canoeing and kayaking groups from seven states regularly hold organized trips on both study segments, and scores of individual boaters from around the Northeast use the river independently.

The upper half of the Massachusetts Study Segment, from Otis to below Cold Spring, is relatively small and slow moving, with a few class II rapids suitable for nontechnical boating. In contrast, the 3-4 mile section from below Cold Spring to New Boston consists almost entirely of technical class III-IV white water (difficult, with drops and waves of up to 4 feet). These rapids attract hundreds of boaters during two weekends every fall, when releases from the Otis Reservoir Dam into a tributary to the West Branch substantially raise water levels in the river. During those releases, this section is the site of one of the nation's oldest annual white water slalom competitions.

The Connecticut Study Segment is considerably wider than the Massachusetts portion, and is generally characterized by densely wooded shorelines with a mixture of flatwater, riffles, and class I-II rapids. The most heavily used section of the river for boating and tubing is the lower part of the study segment, where the river drops through Satan's Kingdom gorge. The setting within the gorge is spectacular, with a stretch of class III white water framed by steep cliffs on both banks. The state-owned and managed Satan's Kingdom Recreation Area just upstream offers a developed access point to the gorge and is the site of a popular tubing concession. This concession is awarded on a competitive bid basis by the Connecticut DEP. The tubing outfitter frequently reaches the maximum use level set by the DEP of 750 tubes on the river in one day. The current concessionaire estimates that use of the area doubled in just three years from 1986-1988.

The Connecticut Study Segment is the most heavily fished section of the Farmington, receiving approximately 1,000 angler days per kilometer per year. As a result of this popularity, in 1988 the DEP's Bureau of Fisheries designated a 2.7-mile stretch in the middle of the study segment as an experimental "trout management area," where only catch and release fishing is permitted and no seasonal restrictions apply. The area

The Massachusetts Study Segment includes a challenging section of tight, technical class III-IV white water that attracts canoeists and kayakers from around the region.

quickly became very popular with anglers, receiving more than 1,600 angler days per kilometer per year (roughly 10,000 trips per year for the overall management area compared to 2,800 trips per year before the catch and release requirement went into effect). The special regulations also resulted in a catch rate 5 to 10 times higher than in other parts of the river. Because the initial trout management area was so successful, the DEP subsequently expanded it in 1993 to include an additional mile upstream of the original boundary. In order to provide universal access to this outstanding fishing resource, the DEP, the Hartford MDC, and the Farmington River Anglers Association constructed and maintain a handicapped fishing access site in the center of the trout management area in Pleasant Valley.

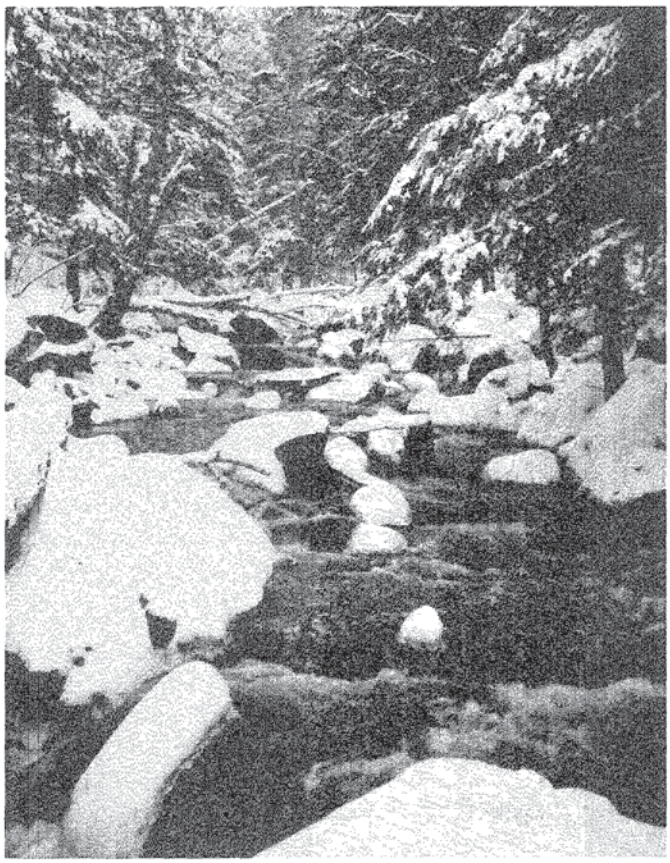
The Farmington's exceptional qualities for instream recreation in the Connecticut Study Segment have been enhanced by the managed flows that have been provided from the Goodwin Dam since the 1960's. As shown in **Figure 2-6** earlier in this chapter, the managed releases have substantially increased flows during the generally drier summer months. Those conditions have resulted in a considerably longer season for the various recreational uses than would exist under natural conditions.[19] The recreational opportunities encompassed in this extended season are particularly significant because most other rivers in the region have insufficient flows to support these uses during the late summer.

In addition to the Farmington's important water-based recreational values, lands along the river also support a wide range of outdoor recreational opportunities, such as picnicking, swimming, hiking, bird watching and wildlife observation, photography, cross-country skiing, and snowmobiling. Camping is very popular in the study area, with public or private campground facilities located along the river in both Massachusetts and Connecticut. Many hikers come through the area on the interstate Tunxis Trail, which traverses Nepaug State Forest and crosses the river just above Satan's Kingdom in New Hartford. Extensive deer hunting and small game hunting is permitted on most public lands. The spectacular New England foliage also attracts many visitors to the scenic roads along the river's banks each autumn.

Public lands in both states support the most intense recreational use of any lands adjacent to the segments. In 1989, the Connecticut DEP estimated that more than 150,000 people made day visits to the three state forests (American Legion, Peoples, and Nepaug State Forests) that abut the Connecticut Study Segment. That year, the DEP also issued more than 9,000 permits for camping at its established facilities in the American Legion and Peoples State Forests.

2.2.8 Scenery

The visual diversity of the upper Farmington valley is a key element contributing to the character of the area. The study segments and surrounding lands retain a natural character only moderately altered by human activity. The view from the river is typically of dense hardwood forests, often covering steep hillsides and periodically broken by fields and small historic towns. The forested ridges running along both sides of the river form visually attractive scenic corridors.



A winter scene on the Fall River, a tributary to the Massachusetts segment in the town of Otis.

[19] Indeed, with respect to the Farmington's popular tubing opportunities, it is conceivable that this warm-weather use might not exist other than on an isolated basis without the controlled releases throughout the summer. If only naturally occurring higher flows in the spring were available, the combination of colder air and water temperatures at that time likely would prevent any significant tubing use.

In a 1983 study, the University of Massachusetts rated the Massachusetts segment as having high scenic quality and intact natural quality reflecting little evidence of human modification. The Connecticut segment offers a similar range of visual diversity. The Satan's Kingdom area is perhaps the most dramatic scenic resource in the Connecticut study area, with turbulent white water flowing through the steep-sided, 200-foot deep and 1500-foot long gorge. Remarkable views are offered both from the river within the gorge and on the trails skirting the cliffs above. The historic river communities in both states add to the scenic diversity of the area, as do the essentially natural sections of the river corridor in the adjacent state forests and other undeveloped lands.

2.2.9 Historic and Archaeological Resources

Noteworthy remnants of the Farmington Valley's long history of human activity can be found throughout the areas surrounding both study segments. Evidence of the Valley's early native inhabitants include important archaeological sites that have been documented along the Connecticut Study Segment. One area in Peoples State Forest has been nominated for listing on the National Register of Historic Places in recognition of its extensive archaeological artifacts.

Historic structures associated with early European settlement are more prevalent. In the Massachusetts study area, 73 historic buildings and sites were identified in the Town of Otis alone. The New Boston Inn in Sandisfield is a landmark dating back to 1737, testimony to the long history of travel through the Farmington River Valley. In the Connecticut study area, four buildings near the river have been listed on the National Register of Historic Places: the 19th century Chapin house in Pine Meadow; the Depression-era Civilian Conservation Corps (CCC) shelter in the American Legion State Forest; the Old Riverton Inn; and the 19th century Gothic revival style stone Union Church, also located in Riverton. In addition, thirteen buildings have been listed on the Connecticut State Register, including the restored and operational Hitchcock Chair Factory, originally built in 1818. Also noteworthy are the concerted efforts made by the Town of New Hartford to promote and conserve its many historic buildings. As part of these efforts, the Town has designated the Pine Meadow area, located adjacent to the river, as a local historic district.

The restored and operational Hitchcock Chair Factory, located in the village of Riverton, Connecticut, is one of many historic structures that contribute to the character of the study area.