

Lower Farmington River and Salmon Brook Management Plan *June 2011*





West Branch Salmon Brook Photo: Joyce Kennedy

Front Cover: Farmington River upstream of Unionville, photo by Tom Cameron

Though originally from the Midwest, Tom Cameron and his wife have adopted and are truly at home on the Farmington River near Collinsville. For the last 7 years his photography work has been almost entirely outdoors. Special interests include unique lighting conditions, water subjects such as reflections and captured motion, sunrises, and a variety of critters from heron to spiders.

Back Cover: Painting by Bill Simpson, Artist/Fly Fisherman, wmsimpson.com

When viewing Bill Simpson's paintings there is the sensation of walking alongside him as he shares his favorite haunts with us. Together we search shoreline sandbars and rips where stripers and blues fight the tide with the safety of deep water near by, or he may lead us above a wooded stream where dappled light rakes the water camouflaging undisturbed trout.

Lower Farmington River and Salmon Brook Management Plan *June 2011*

Lower Farmington and Salmon Brook Wild and Scenic Study

C/o FRWA

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Simsbury, CT 06070

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Lower Farmington River and Salmon Brook Management Plan *June 2011*

The Lower Farmington River and Salmon Brook Wild and Scenic Study Committee

The Study Committee's membership includes locally appointed representatives from each town in the Study Area, and representatives from the Connecticut Department of Environmental Protection (CT DEP), the National Park Service (NPS), the Farmington River Watershed Association (FRWA), the Salmon Brook Watershed Association (SBWA), Stanley Black & Decker, the Tariffville Village Association (TVA), the Connecticut Forest and Park Association (CFPA), Whitewater Triple Crown, and the Pequabuck River Watershed Association (PRWA).

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Harry Spring*–Former Inland Wetlands Commissioner
Lisa Levin*–Lawyer & Educator
Rob House–Conservationist

Bloomfield

Paula Jones*–Conservationist
Kevin Gough*–Conservationist

Burlington

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Thomas Small*–Burlington Land Trust

Canton

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Windsor

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Terry Langevin*–Friends of Northwest Park Board Member
Melissa Vanek–Environmental/Science Educator

Stanley Black & Decker

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TVA

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PRWA

Mary Moulton–PRWA President

Whitewater Triple Crown

Andy Kuhlberg–Race Chair

CT DEP

Susan Peterson*
Maryann Nusom Haverstock*
Sally Snyder (past member)

National Park Service

Jamie Fosburgh–New England Team Leader
Joyce Kennedy Raymes–Study Coordinator

** Officially Appointed*

A Brief History of the Lower Farmington River and Salmon Brook Wild and Scenic Study

In 1994, the upper 14 miles of the Farmington River in Connecticut were designated a Wild and Scenic River. As the passing years proved this designation to be a success in terms of facilitating river protection without infringing on local autonomy, interest arose in securing Wild and Scenic designation for the downstream segment of the river as well. The lower reach of the Farmington River is rich in recreational, historical, and biological values and has an important tributary, the Salmon Brook, also noted to be among the state's most significant coldwater resources. The groundbreaking Farmington Valley Biodiversity Project (FVBP) covering six of the ten Study Towns and published in 2006, laid important groundwork for the Wild and Scenic Study and Management Plan because it documented the exceptional biodiversity of the watershed. As a result, the Farmington River Watershed Association (FRWA) led the effort to pursue congressional authorization for a Wild and Scenic Study of the lower Farmington and Salmon Brook. Under FRWA's leadership, all ten study area towns (Avon, Bloomfield, Burlington, Canton, East Granby, Farmington, Granby, Hartland, Simsbury and Windsor) provided letters of endorsement to the Congress of the United States supporting a Wild and Scenic Study. The proposed study area extended from the Canton/New Hartford town line (the lower boundary of the designated segment of the upper Farmington River) down to the Farmington's confluence with the Connecticut River, and the east and west branches of Salmon Brook. (see Figure 1: General Location and Study Towns) Congresswoman Nancy Johnson and Senator Chris Dodd were instrumental in securing Congressional authorization and funding for the study. The Study bill was passed by Congress at the end of 2006.

A locally-based Wild and Scenic Study Committee began meeting in April, 2007. Committee members were appointed by their towns or respective organizations, and brought a wealth of knowledge and experience in governmental, ecological and organizational processes to the study team. Additional input from independent researchers, local supporting agencies, professional contractors, and the general public have helped ensure the study's progress and comprehensiveness.

The Study Committee's findings confirmed the view of many Farmington Valley residents

that the unique natural and cultural resources of the lower Farmington and Salmon Brook make the lower Farmington River and Salmon Brook eligible for Wild and Scenic designation. The designation will highlight the Outstanding Resource Values (ORVs) of the watercourses, will provide a sense of connectedness and pride to the people of the Farmington River Valley, and will enhance economic opportunities. It will also allow river towns to benefit from National Park Service funding and technical resources in their locally-driven efforts to protect the natural and cultural resources of the lower Farmington and Salmon Brook.

Acknowledgements

The Lower Farmington River and Salmon Brook Wild and Scenic Study Committee began meeting in April 2007 and will continue to meet until the river and brook are designated. The process benefitted immensely from the help of many individuals and organizations that shared their expertise, brought important questions to the Committee's attention, and generously provided their guidance and support. We are deeply grateful to them all. We owe a special debt of thanks to:

- Eric Hammerling, who got our Study underway in his former position as Executive Director of the Farmington River Watershed Association. He has helped us many times over the following years with his wisdom, his knowledge of the river and river issues and his understanding of state and local politics.
- Eileen Fielding, who became the current Executive Director of the Farmington River Watershed Association when the Study was only shortly underway, and had it dropped into her lap along with the rest of her new responsibilities. She has graciously accepted various writing assignments, reviewed and edited the work of other contributors, attended many meetings and made innumerable phone calls on our behalf. The Farmington River Watershed Association's contribution to the Management Plan and Study was supported in part by a grant from the Hartford Foundation for Public Giving. We deeply appreciate the Hartford Foundation's commitment to environmental stewardship in the greater Hartford region.
- Ralph Lewis, former State Geologist, who took most of a day to give us a crash course in the geologic history of Connecticut and then wrote the description of it for the Management Plan.
- Ken Feder, an Anthropology professor at Central Connecticut State University. He found a way to add a section to our Archaeology report predicting the likelihood of finding new archaeological sites in unexplored places, something we had not asked for nor expected. He came to all our Open Houses and was generous in sharing his collections and his infectious enthusiasm.
- Josef Treggor and Jay Kaplan organized and worked on the special Farmington River corridor bird survey done for our Study at no cost.
- The law firm of Robinson and Cole, LLC, through their generosity, the Study Committee received a review of the land use regulations of all ten towns in the Study Area, with most of the work done on a pro bono basis.

The study would not have been possible without the tireless commitment of many volunteers, organizations, contractors and agencies that dedicated their time and expertise. We apologize for any omissions. They are our responsibility and are not intentional.



Sally Rieger
Chairman

Lower Farmington River and Salmon Brook
Wild and Scenic Study Committee

Note from the Study Coordinator: The Wild and Scenic Study would not have been possible without the support and amazing commitment of the Study Committee representatives. When committee members accepted this assignment there was no way to know that the Study would extend beyond the four-year mark. Yet the committee remained engaged and enthusiastic about the ultimate goal of protecting the lower Farmington River and Salmon Brook resources through Wild and Scenic designation. In particular, I would like to thank Sally Rieger, the Committee Chair for her leadership, vision and boundless energy. She put aside many professional and personal commitments to be involved at every step of the study process. Thanks also to Jamie Fosburgh, NPS New England Team Leader for his calm and insightful guidance.

Towns of Avon, Bloomfield, Burlington, Canton, East Granby, Farmington, Granby, Hartland, Simsbury and Windsor

Towns Leaders and Staff

Town Commissioners and Board Members

Town Libraries: For Use of Display Cases and Space for Open Houses

Canton Parks & Recreation Department: For use of Community Center for Meeting Space

Simsbury Library: For Use of Conference Room for Four-Day LULA Workshop

Special thanks also to the residents of the Study Towns for their questions, participation and support

Organizations & Partners

American Rivers

Connecticut Forest and Park Association

Eightmile River Wild and Scenic River Coordinating Committee

Farmington River Coordinating Committee

Farmington River Watershed Association

Farmington Valley Trails Council

Hartford Audubon Society

Heads Up! Hartford

Historical Societies and Land Trusts of the ten Wild and Scenic Study Towns

Keep the Woods

Land Trust Alliance

Land Use Leadership Alliance and the Workshop Attendees

North Central Conservation District

Northwest Conservation District

Pequabuck River Watershed Association

Rivers Alliance

Roaring Brook Nature Center

Salmon Brook Watershed Association

Simsbury Community TV

Tariffville Village Association

The Nature Conservancy

Federal and State Agencies

Metropolitan District Commission

National Park Service

U.S. Fish & Wildlife Service

U.S. Geological Survey

Connecticut Department of Environmental Protection

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Collinsville Canoe & Kayak
Flatbread Pizza
Grist Mill Restaurant
LaSalle Market
Matthew's Restaurant
Peaberry's Cafe

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Jason Natelle
Alison Rau
Robert Roehm
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David Askew
Al Blanchard
Dick Caley
Kevin Case
Jelle deBoer
Nathan Frohling
Ken Geisler
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Photo: Tom Cameron



Photo: Tom Cameron

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Photo: Tom Cameron

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[HTTP://WWW.LOWERFARMINGTONRIVER.ORG/](http://WWW.LOWERFARMINGTONRIVER.ORG/)

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the Federal Wild and Scenic Study Bill,
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Scenic designation, letters of endorsement
and support, and examples of outreach and
education conducted during the Wild and
Scenic Study.

Executive Summary

An essential part of the lower Farmington River and Salmon Brook Study process was development of this Management Plan (Plan). This Plan is a **non-regulatory, advisory document**, reflecting a partnership in which local, state and federal interests voluntarily participate in its implementation and the realization of its purpose and goals. The plan was developed by the locally-led Wild and Scenic Study Committee, with the help of many others. A working draft of the Management Plan was distributed to town land use commissions, local citizens, the state and other key stakeholders, and also posted on the Study Committee's website, to solicit input and comments prior to submitting it to the National Park Service and Congress for approval.

The Management Plan provides a vision and action strategy for the cooperative management and protection of the lower Farmington River and Salmon Brook and their ORVs.

The development of the management plan was guided by three fundamental principles:

1. Resource conservation and protection relies on existing authorities.
2. Management of the corridor is based on a cooperatively developed plan that is implemented through the cooperation of all river interests.
3. Any land conservation initiatives related to a Wild and Scenic designation will be based solely on voluntary willing seller arrangements.

The roles and responsibilities of land use planning and regulatory commissions and agencies do not change with a Wild and Scenic designation. *There are no federal mandates or new regulatory powers created with a designation.*

This Management Plan details the “**Outstandingly Remarkable Values**” that are associated with the lower Farmington River and Salmon Brook and their immediate environments. For the purposes of this document and for the sake of concision, the Outstandingly Remarkable Values are referred to as **Outstanding Resource Values (ORVs)** within.



Autumn on the lower
Farmington River
Photo: Larry Schlegel

CHAPTER 1

The Management Plan

Introduction

Purpose. The Management Plan is a guidance document for protection and enhancement of the Outstanding Resource Values (ORVs) and provides a framework for the Wild and Scenic Committee to follow in planning its conservation work. Town citizens, local land use commissions and the state have endorsed this advisory plan and have committed to participate in its implementation. Community and state endorsement of the Management Plan substantiates eligibility for designation by demonstrating local commitment to river conservation.

Principles. The Wild and Scenic Rivers Act, Section 10(a) specifies that designated rivers should be managed according to the following principles:

1. *Each component of the national Wild and Scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its esthetics, scenic, historic, archaeological, and scientific features.*
2. *Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.*

Objectives. The Management Plan achieves five objectives:

1. It gives stakeholders clear recommendations on how to protect and enhance the ORVs, and describes the role of a Wild and Scenic advisory committee in implementing such recommendations.
2. It provides a blueprint for how all partners can proceed in ensuring the long-term protection of the ORVs. It also identifies strategies to measure the quality of the ORVs over time. Where possible, it provides quantifiable approaches to determine how well the ORVs are being protected and enhanced.
3. It serves as the Comprehensive Management Plan required of all congressionally designated Wild and Scenic Rivers.



Resident provides input during community open house

Photo: Joyce Kennedy

4. It establishes eligibility for federal, technical and financial assistance if the lower Farmington and Salmon Brook are designated as components of the National Wild and Scenic Rivers System.
5. Based on locally-led and locally-implemented strategies, the Plan can be used to help all stakeholders protect the rivers' ORVs regardless of whether a designation is achieved.

The Management Plan will require occasional updates and adaptations to account for changing resource protection needs, as new priorities arise and older projects are concluded. Revisions to the Plan can also incorporate new or preferred methods of protecting resources as indicated by new information or research.

Elements.

The Management Plan has the following elements:

Local Leadership: The Plan was developed by the locally-led Wild and Scenic Study Committee with input from town land use commissions, local citizens, the state, other key stakeholders and professional advisors.

Local Implementation: The Lower Farmington River and Salmon Brook Management Plan is a non-regulatory document, reflecting a partnership between local, state and federal groups that voluntarily agree to participate in its implementation and the realization of its purpose and goals. The roles and responsibilities of land use planning and regulatory commissions and agencies will not change if a Wild and Scenic designation occurs.

Support for Implementation Costs:

Costs associated with implementing the Management Plan are to be funded through annual National Park Service budget allocations that may be available once the river is designated. If designation is delayed, unsuccessful, or insufficiently funded by the NPS, towns have no obligation to expend funds. However, many of the costs associated with implementing recommendations in the Plan are negligible so towns and partners can elect to implement the plan regardless of the status of designation. A completed, endorsed Management Plan is itself a powerful tool for leveraging other sources of in-kind or financial support.

Scientifically-Driven Protection of

Community Assets: This Plan relies on scientifically sound recommendations to protect the Outstanding Resource Values (Geology, Water Quality, Biological Diversity, Cultural Landscape and Recreation) identified during the study. The benefits, e.g. protecting a drinking water supply, maintaining the area's scenic qualities, enhancing recreational resources and managing the river's diverse plant and animal life, all contribute to the high quality of life that residents of the communities expect and appreciate.

Developing the Management Plan

Assessing the Outstanding Resource Values (ORVs)

The Study Committee, with expert assistance, identified and documented five categories of ORVs in the river corridors which are described in depth further on in this document. Then, to develop management priorities, each ORV was assessed using the following steps:

1. ***Determining existing resource protections*** by engaging consultants to determine the adequacy of those protections through a comprehensive review of town regulations, plans and policies as well as current federal and state regulations.
2. ***Setting protection goals*** for each outstanding resource value at local, state, and federal levels that (a) meet the requirements of Section 6(c) of the Wild and Scenic Rivers Act, and (b) meet any additional protection goals deemed appropriate by the Study Committee.
3. ***Identifying threats*** that currently impact or are likely to impact the ORVs and assigning them priorities based on the significance and likelihood of their potential impact.
4. ***Comparing ORV protection goals with known and potential threats*** in order to assess the effectiveness of existing resource protection and to identify potential gaps in protection.
5. ***Establishing recommended management priorities and strategies*** based on gaps in protection: Where gaps were identified between existing protection measures and desired levels of protection, strategies to fill such gaps are recommended in the Management Plan.

The Study Committee, with expert assistance, identified and documented five categories of ORVs...

Obtaining Community Participation

Throughout the process of developing the Management Plan, a significant outreach and education component ensured input and involvement from town leaders, staff, boards, commissions, and local stakeholders and residents. The key actions taken included:

- Multiple meetings with each town's leaders and staff, as well as multiple presentations to all of the ten towns' boards and commissions to educate, gain input and seek recommendations for the development of the Management Plan. These kept the public engaged in the study and aware of its progress.
- Meetings with Connecticut State Representatives for the Study Area and with the Chair of the Environment Committee, which led to broad support and unanimous passage of Public Act No. 08-37, An Act Concerning Designation of the Lower Farmington River and Salmon Brook within the National Wild and Scenic Rivers System. The Act, which Governor Rell signed into law on May 7, 2008, conveys the state's support for designation and directs the CT DEP to cooperate with the implementation of the Management Plan. See Study Report for copy of the Act.
- Distribution of a draft of the Municipal Plan & Regulation Review, conducted by the law firm of Robinson and Cole, to appropriate town staff for comment and further input prior to conducting the gap assessment for the Management Plan. This critical step furthered the dialog with towns regarding the development of the Management Plan and brought out the importance of using the Connecticut enabling statutes and model regulations when regulating for greater protection of the ORVs.
- A Land Use Leadership Alliance (LULA) Workshop in Simsbury, sponsored by the Study Committee in Spring 2009. Approximately 35 local participants attended the four full-day sessions. Attendees were community leaders from all of the ten study towns, including members of local land use commissions and other boards and commissions, land trust members, town land use staff, town leaders, a developer, and Wild and Scenic Study Committee representatives. This unique, intensive training allowed Study Committee members and local land use decision makers to exchange ideas and information. Participants provided critical input toward the development of the Management Plan. LULA trainers demonstrated how Connecticut's enabling legislation can be used to strengthen regulations that protect natural resources and lead toward achieving low impact development.
- Wild and Scenic Study Open Houses held in four towns (Avon, Canton, East Granby, and Farmington), at sites convenient to residents. Widely publicized, these open forums gave the public an opportunity to learn about the ORV research results, ask Committee members about the study process, and provide input for the Management Plan.
- Posting the Draft Management Plan at the Wild and Scenic website for public comment.
- Attending community events in all ten towns and displaying educational Wild and Scenic materials at all ten public libraries.
- Local television and regional radio stations presented programs about the Wild and Scenic Study.
- Presentations by Study Committee members to local organizations.
- Requesting and receiving formal endorsement of the Wild and Scenic designation and the Management Plan by all ten towns in the study area after providing ample opportunity for the towns to ask questions and review and comment on the Management Plan. Many individual town commissions and boards also provided formal endorsement of the designation and Management Plan. Additionally, many local and regional organizations and individuals have written letters in support of the designation. See Study Report for copies of the endorsement and support letters.

Though the management plan is completely advisory, it is critical that so many partners have had an active role in developing its recommendations, and have endorsed the strategies that can be used to protect the ORVs. This commitment of the various

partners in river protection, a commitment developed and reaffirmed throughout the study process, will foster effective implementation. Community and state endorsement of the Management Plan substantiates eligibility for designation by demonstrating commitment to river conservation.

Commitment to Management Plan implementation has been demonstrated locally by continued land conservation efforts, revision of land use and wetland regulations (to reflect recommendations in the *Municipal Plan and Regulation Review*) and through policies that recognize the importance of protecting land in the river corridor and the value of designating the watercourses.

Determining Adequacy of Existing Protection

As noted above, the Management Plan development process must include an assessment of existing mechanisms that protect and enhance the Outstanding Resource Values (ORVs) of the river system. That assessment must:

1. Determine whether local policies and regulations meet the requirements of Section 6(c) of the Wild and Scenic Rivers Act, which states:
(c) Neither the Secretary of the Interior nor the Secretary of Agriculture may acquire lands by condemnation, for the purpose of including such lands in any national wild, scenic or recreational river area, if such lands are located within any incorporated city, village or borough which has in force and applicable to such lands a duly adopted, valid zoning ordinance that conforms with the purposes of this Act. The standards specified in such guidelines shall have the object of (A) prohibiting new commercial or industrial uses other than commercial or industrial uses which are consistent with the purposes of this Act, and (B) the protection of the bank lands by means of acreage, frontage, and setback requirements on development.
2. Identify any additional protection goals deemed desirable (though not required) by the Management and Protection Subcommittee.

To meet the first objective, the Study Committee contracted the law firm of Robinson & Cole to inventory and assess the regulations and policies formally adopted

prior to July 2008 in the ten river corridor towns that address the protection and enhancement of the Outstanding Resource Values (ORVs) in the Lower Farmington and Salmon Brook. The study addressed each town's municipal plan and regulations, with respect to each ORV. The full *Municipal Plan and Regulation Review (Review)* can be found in the Appendix.

As a result of the *Review* and other analyses during the Wild and Scenic Study it was concluded that the current combination of local, state and federal regulations, protected lands, and local commitment to conservation comprise a protection scheme that is adequate and makes federal condemnation of lands *unreasonable and unnecessary*. No new actions are deemed necessary to meet the requirements of Section 6(c). In support of this conclusion, important local, state and federal protections were identified, including the following:

- Municipal Inland Wetland and Watercourse Commissions can regulate for activities in upland review areas that would likely impact wetland or watercourse function. Local upland review areas are in place in all ten communities. The towns protect the area adjacent to watercourses and wetlands by reviewing all proposed activities along wetlands and watercourses. All of the towns have an upland review area of at least 100 feet upland of the wetland or stream; some towns have a greater regulated upland review area. Reviews in upland areas may include assessing and regulating impacts from a proposed activity on water quality and hydrologic and ecological functions. This is the single most important local regulatory authority in place, and indicates a consistent and strong willingness among the ten river towns to protect the water resources.
- The state has comprehensive enabling legislation governing the use of land, and it grants authority to towns to adopt regulations that effectively implement legislation at the local level. Towns therefore have the power to choose regulatory tools to gain greater resource protection and have the flexibility to do so.
- Within the river corridor, over 27 percent of land is protected in open space and

Overall, the Study Area towns are doing a good job in managing the ORVs

recreation. This exceeds the state's overall goal of preserving 21 percent of its open land by 2023. Just over 9 percent of land in the corridor is agricultural. All ten towns have land trusts and their land holdings total approximately 6000 acres.

- A significant number of the towns allow for cluster and open space residential subdivisions that allow for greater protection of open space and/or particular natural features on a site. Modification of traditional subdivision regulations for development is an example of how the towns are using local regulations to protect outstanding resources.
- The Towns of Canton and Hartland have demonstrated their commitment to the Wild and Scenic designation through their membership on the upper Farmington River Wild and Scenic Coordinating Committee and enactment of a Farmington River Protection Overlay District.
- The Town of Farmington has a policy of promoting coordination with the Farmington River Watershed Association in support of its work toward the Farmington River's inclusion in the National Wild and Scenic Rivers Program, as well as a policy that encourages the adoption of a Farmington River Protection Overlay.
- In 2009 the Town of Bloomfield included in their revised Zoning Regulations an Overlay District for Talcott Mountain that addresses the problems of soil erosion and sedimentation and adverse visual impacts, thereby acknowledging the importance of the mountain in defining community character. In addition, they adopted new stormwater management requirements and a comprehensive overhaul of the FEMA requirements regarding flooding.
- The New England National Scenic Trail was designated in 2009 and runs through five of the ten study towns including Avon, Bloomfield, East Granby, Farmington and Simsbury.
- Almost every town has signed some type of regional compact such as the Farmington River Watershed Compact and the Metacomet Ridge Compact. The Town of Farmington has already acknowledged the potential Wild and Scenic designation in their plans.

- The Town of Granby supported the 2010 designation of the Salmon Brook as an official State of Connecticut Greenway.
- The Towns of East Granby and Farmington have developed regulatory protection of archaeological resources.
- The Town of Hartland has acknowledged in a written correspondence (found in the appendix) the usefulness of the *Municipal Plan and Regulation Review* in the preparation of their newly revised Inland Wetland and Watercourse Regulations.
- The State of Connecticut, in cooperation with the Farmington River Watershed Association (FRWA), has led an effort to remove the breached Spoonville Dam that currently blocks fish passage for some species. A removal design is complete and FRWA is currently seeking funding for the removal.

Thus the first objective of the Robinson and Cole study, i.e., determining adequacy of existing protections, was met. To meet the second objective, the study provided recommendations for additional protection goals to include in the Management Plan. Though not required by Section 6(c), these recommendations are considered very important to optimizing the overall long-term quality of the Farmington River and Salmon Brook's ORVs. Specific recommendations are listed for each Outstanding Resource Value throughout the Management Plan.

Summary of the Protection Review

Overall, the Study Area towns are doing a good job in managing the Outstanding Resource Values (ORVs) of the Farmington River and Salmon Brook. In addition to adequate regulations, there are important partnerships involving federal, state and town governments, nongovernmental organizations, and individuals that also help protect the resources. Actions have been taken to protect agricultural land, recreational resources, and water resources through open space acquisitions, conservation easements and various designations that promote public recognition of land stewardship.

Though existing protections are deemed adequate, it is important to ensure optimal protection of ORVs over time and, in a changing environment. To do so, the Study Committee identified a protection goal for each ORV, identified threats and management

issues that could degrade ORV quality, noted potential gaps between these threats and the **existing** protections, and recommended tools or techniques for improving protection and enhancement of the ORVs at the local level.

Opportunities identified by the *Municipal Plan and Regulation Review* for more recognition and protection of ORVs are incorporated into this Plan and its appendices. One top priority is for towns to make full use of the resources available from the state that promote resource protection, especially opportunities to strengthen town regulations, based on state statutes already in place. In addition to the *Review's* recommendations, the Study's Management & Protection Subcommittee also has identified actions that communities can take to support enhanced long-term protection of the river's ORVs.

Local Commitment

During the Study, towns and other local partners have collaborated with the Study Committee on projects which demonstrate strong local commitment to protecting the Outstanding Resource Values of the Farmington River and Salmon Brook. For example:

- The Study Committee, the Town of Avon, and local volunteers have collaborated to manage invasive species in Fisher Meadow, an important floodplain along the Farmington River.
- A portion of Salmon Brook was nominated and designated as an official Connecticut Greenway in 2010, with the support of the Town of Granby.

- A local nature center and members of the Hartford Audubon Society contributed many hours to complete a migratory bird survey to supply data for the Study.
- Area land trusts participated in a land trust integration survey, which was conducted to determine how to achieve goals shared by both the Study Committee and land trusts.

A Land Use Leadership Alliance (LULA) Workshop drew participants from all 10 study towns, gaining input for the Management Plan and training local leaders on strategies for natural resource conservation, low impact development, and effective decision-making.

- The Triple Crown Whitewater Canoe and Kayak Races in the Tariffville Gorge have been supported by the Study Committee through funding, planning and volunteer participation
- The Study Committee has welcomed additional members and partners throughout the study process, including the Connecticut Forest & Park Association, the Tariffville Village Association, the Pequabuck River Watershed Association and the Whitewater Triple Crown Committee.
- The "Suggested Recreation Projects for Member Towns" list found in Appendix was developed with input from the towns as a source of ideas for the committee to pursue if designation is achieved.

**Study Committee sponsored
invasive plant removal project at
Fisher Meadow, Avon**

Photo: Joyce Kennedy





"Where beautiful things happen"

Photo: Tom Cameron

CHAPTER 2

Wild and Scenic Study Process and Background

The National Wild and Scenic Rivers System

The National Wild and Scenic Rivers System was established by Congress in 1968 to protect outstanding rivers from the harmful effects of *new* federally assisted projects such as dams and hydroelectric facilities. To be considered "Wild and Scenic" a river or river segment must be free-flowing and have at least one Outstandingly Remarkable Value, known in this Plan as Outstanding Resource Values (ORVs). The ORV must be natural, cultural or recreational in character and have unique, rare or exemplary qualities on a regional or national scale. "Free-flowing" refers to flow within the designated river segment and is not the same as naturally flowing.

Over 160 rivers or river segments have been protected nationwide (representing over 11,000 river miles), including ten rivers in the Northeast. The upper 14 mile reach of the Farmington River in Connecticut was among the first to be designated as a Partnership Wild and Scenic River in 1994. The Eightmile River in Connecticut was also designated as a Partnership River in 2008.

Partnership Wild and Scenic Rivers

The Partnership Wild and Scenic Rivers make up a subset of the Wild and Scenic Rivers System. The Partnership Wild and Scenic program was developed in response to the need for a Wild and Scenic River designation that is tailored to rivers of Outstanding Resource Value that are characterized by historical alterations, extensive private land ownership along the river, and well-established local control of river management. This program has a proven track record of effectively creating river protection strategies that bring communities together in protecting, enhancing and managing local river resources. The National Park Service recognizes 13 Partnership Wild and Scenic Rivers along the east coast that share some common management approaches including:

- No reliance on federal ownership of land.
- River and land use management that is regulated through existing local and state authorities, the same as before a designation.
- Administration and implementation of the advisory Management Plan that is accomplished through a broadly participatory advisory committee, convened for each river specifically for this purpose.
- Responsibility for managing and protecting river resources that is shared between the local, state, federal and non-governmental partners on the committee.
- Reliance on volunteerism as a key to success.
- No National Park Service Superintendent, law enforcement, or similar elements of traditional federally managed units of the National Park System.

Benefits of a Wild and Scenic Designation

Through National Park Service funding and staff support, resources are available to help the committee partners achieve the protection of the river's Outstanding Resource Values

(ORVs). Typical results of Wild and Scenic designation are:

- **Preservation of a clean water supply for local residents:** The many approaches recommended to protect water quality in the watercourses will have a direct benefit on drinking water supply.
- **Protection of the character that defines the local communities:** Designation provides opportunities to support conservation of cultural landmarks, conserve stream banks, voluntarily protect wildlife habitats and important open space areas, and ensure that river and stream quality remain high.
- **Robust and diverse plant and animal populations that reflect a healthy ecosystem:** A key component of the character and quality of the designated area is the plant and animal life that naturally exists there.
- **Possible funding to help towns achieve their open space conservation goals:** Designation may leverage opportunities for funding that can help the local towns and state achieve open space conservation goals, saving towns money.
- **Information and technical support that assist local land use commissions and town staff in making decisions:** This can save commissions and their applicants' time and money, and facilitate sound decisions based on good science and technical expertise.
- **Small grants to help local schools, towns, scouts, civic groups, land trusts, private landowners and others on projects which support the purposes and goals of the plan:** Often a portion of Wild and Scenic funding is offered as small grants by the local Wild and Scenic Committee to support activities that enhance the ORVs and build the partnership capacity of the grant recipient.

Farmington River twilight

Photo: Wanda Colman



- **National recognition and prestige associated with a designation:** Area towns may see an increase in tourism and an economic benefit to local businesses. The local Wild and Scenic Committee may produce recreational and educational guides that encourage proper recreational use of local resources.
- **Outreach and education about techniques that protect our rivers and maintain the characteristics that provide a sense of place:** Publications, programs and trainings that highlight river resources and promote best management practices can be offered to a variety of audiences such as land use commissions, local landowners and schoolchildren.
- **Financial help for town activities:** Assistance may be available to help a town design and implement maintenance projects, e.g., a streambank erosion control effort that would secure a threatened roadway and still protect river values.
- **Funding and staff support through the National Park Service:** National Park Service staff provide important advisory and technical help to the upper Farmington's Wild and Scenic Committee. Similar support could be expected for the lower river if designated.
- **Prevention of federally funded or permitted projects that are determined to have an adverse impact on ORVs:** Wild and Scenic Rivers are protected from federally permitted or funded "water resource development projects" that would have a "direct and adverse" impact upon the ORVs that made the river eligible for designation.

Wild and Scenic Study

To determine whether a particular river or river segment is eligible to be included in the National Wild and Scenic Rivers System, a Wild and Scenic River Study is conducted. To initiate such a study of the Farmington River and Salmon Brook, the Farmington River Watershed Association worked with leaders in the ten towns to encourage the Congressional delegation to introduce "The Lower Farmington River and Salmon Brook Wild and Scenic Study Act." Senators Chris Dodd and Joe Lieberman introduced a bill that passed the Senate in late 2005. In November 2006 the House passed a companion bill

with the support of Representatives Nancy Johnson and John Larson. On November 27, 2006 Public Law No. 109-370 was signed into law by President Bush. This Bill authorized a Feasibility Study to identify, research and document the most unique and outstanding features and determine whether the Lower Farmington River and Salmon Brook meet the eligibility criteria for designation as "Wild and Scenic" resources.

The study was conducted according to the principles associated with the Partnership River Study approach. It was locally-led by a Wild and Scenic Study Committee in partnership with the local communities and river stakeholders. Membership of the Study Committee includes representatives from the ten towns, the Farmington River Watershed Association, the Salmon Brook Watershed Association, the CT DEP, and Stanley Black & Decker, corporate owner of the hydro operation at Rainbow Dam in Windsor. Other organizations and individuals later joined the committee, including the CT Forest & Park Association, the Pequabuck River Watershed Association, the Tariffville Village Association and the Whitewater Triple Crown Committee. The National Park Service provided staff support and overall coordination.

The Study Committee with locally appointed representatives from the ten towns of the Study Area and representatives from other river stakeholder entities was tasked with:

1. Providing local knowledge and expertise to help guide and interpret research on the natural, cultural, and recreational resource values associated with the rivers. This information forms the basis for both Outstanding Resource Values determinations and the River Management Plan.
2. Developing a comprehensive local advisory management plan to serve as a blueprint for improved management and conservation of the identified natural, cultural, and recreational values, with technical assistance from the National Park Service. This Plan could serve the river, local communities, state agencies and other stakeholders regardless of whether Wild and Scenic River status is achieved or even sought as a result of the study.
3. To serve as the focal point for local community, citizen, and stakeholder involvement throughout the study process.



Salmon Brook Photo: Tom Cameron

To meet these goals, the Study Committee conducted extensive research, established resource protection priorities and worked intensively within the communities to educate and gain input for the Management Plan.

Upon completion of all study components, the National Park Service summarized the research and findings in a report to Congress. Presentation of the Study Report to Congress is followed by a public comment period. Designation requires that a bill be passed by Congress and signed by the President.

Summary of Findings

Requirement of Free-Flowing Condition

Dams. The Lower Farmington and Salmon Brook Wild and Scenic Study Committee, in cooperation with the Connecticut Department of Environmental Protection, has assessed the existing dams of the lower Farmington River and Salmon Brook to determine whether the structures meet the Act's free-flowing river definition that permits the existence of low dams on Wild and Scenic Rivers and whether the structures are compatible with the free-flowing river definition. The DEP supplied the Study Committee with an

inventory of the dams considered to be within the Study Area, a few of which either no longer exist or are located on tributaries. The watercourses have a series of seven historic dams due to the river-powered industries of the past with five dams on the Farmington and two dams on the East Branch of the Salmon Brook. The majority of the dams are small or free-flowing and not an obstacle to fish passage. Two dams have high historical significance. Funding is currently being sought for removal of the Spoonville Dam which is estimated to cost 1.4 million dollars. Funding in the amount of \$500,000 was just recently awarded through the Connecticut Long Island Sound Fund license plate program. Full dam removal will restore the site for fish passage of a range of diadromous and resident species. In addition, safety conditions will be improved for paddling this river segment.

As a result of the dam assessment, the Upper and Lower Collinsville dams in Canton and the Rainbow Dam in Windsor are being recommended for exclusion from the designated reaches. The size of Rainbow Dam and its hydroelectric operation, and the

The Management Plan is a guidance document for protection and enhancement of the Outstanding Resource Values and provides a framework for the Wild and Scenic Committee to follow in planning its conservation work.

proposed hydropower installations now under study for the Collinsville dams, are deemed incompatible with designation. Exclusion of segments with large dams or hydropower operations is acceptable and appropriate along designated rivers.

Approximately 40 miles of the lower Farmington River and 26 miles of the Salmon Brook meet the free-flowing criteria for Wild and Scenic River eligibility. Due to the presence of several historical, low-head dams and remnant dams, the segments best meet the free-flowing criteria for “recreational” classification. The Rainbow Dam and impoundment are significant structures which fail the “generally riverine in appearance” threshold. Therefore, the 4.5 mile segment encompassing the Rainbow Dam and reservoir is not found to be free-flowing.

The free-flowing eligibility analysis revealed that six of the seven existing dams of the lower Farmington River and Salmon Brook meet the eligibility criteria for designation due to their free-flowing condition.

Study of flows. Streamflow conditions on the Lower Farmington River are governed by a complex series of legal and procedural arrangements dating back to the 1800s. Riparian Agreements between the Metropolitan District Commission and local towns and other hydropower users established a system for managing the water flow to serve river users and benefit the river system. During the upper Farmington River Wild and Scenic Study, prior to the upper river’s Wild and Scenic designation in 1994, an in-stream flow study was conducted, in part to assess the effects of dams further upstream that regulate flow. The flow study documented the multitude of demands for water and determined that the resulting river flows are adequate to support the in-stream values for which the river was designated. They concluded that the existing flows are regulated through established minimum and optimum flows that support the river’s fisheries, biological and recreation resources and aesthetic qualities. The regulation of flows has helped to sustain and enhance river uses, such as recreation, particularly during low flow periods. In summer when the natural flows are lowest —recreational flows are supported through stable and predictable releases from upstream dams. In fact, the Tariffville Gorge

is an Outstandingly Resource Value (ORV) in part due to its regional significance as a year-round paddling destination. Biological productivity is also enhanced by the consistent river flow regime.

This flow study is a tool for maintaining adequate river flows because it can show whether future water allocation demands are compatible with protection of the Outstanding Resource Values. A more detailed summary of the flow study can be found in the Upper Farmington River Management Plan at <http://www.farmingtonriver.org/ResourcesandLinks/tabid/60/Default.aspx>

Demonstration of Outstanding Resource Values (ORVs)

The Study Committee led and supported the Study that resulted in the research and documentation of five ORVs of the Study Area. Local, regional and state resource professionals determined the Farmington River and Salmon Brook are exceptional watercourses with respect to geology, water quality, biological diversity, cultural landscape and recreation. Detailed descriptions and references to the completed research for each of the ORVs are found within this Management Plan text and accompanying appendices.

Requirement of Local Support and Generation of the Management Plan

A review and analysis was conducted in a manner consistent with the principles of the Wild and Scenic Partnership River approach. The Committee documented and substantiated local support and commitment both to designation and to locally-based river protection actions and then prepared a locally-supported management plan for the watercourses that details the strategy for future protection of the area’s outstanding resources. Development of the Lower Farmington River and Salmon Brook Management Plan was of central importance to the Study Committee. The Management Plan is a guidance document for protection and enhancement of the Outstanding Resource Values and provides a framework for the Wild and Scenic Committee to follow in planning its conservation work. Each of the ten towns formally endorsed the Management Plan through votes of their chief executive officers. Land use commissions, local organizations and the state have endorsed the

Plan as well. Endorsement of the Management Plan by the partners substantiates eligibility for designation by demonstrating local commitment to river conservation. This type of management framework has proven to be a successful approach in providing management coordination and implementation on the 12 other Partnership Wild and Scenic Rivers.

Summary

The Lower Farmington River and Salmon Brook Wild and Scenic Study has thus established that the lower Farmington River and Salmon Brook meet the definition of free-flowing and possess Outstanding Resource Values. 37 miles of the lower Farmington River, and the entirety of the Salmon Brook, including the main stem and east and west branches, totaling 26.4 miles, are found to be eligible *and* suitable for Wild

and Scenic River designation. Approximately 63 miles of the lower Farmington River and Salmon Brook are recommended for designation as “recreational” under the National Wild and Scenic Rivers Act, to be managed in accordance with this Management Plan. Further, the Study has determined that there is adequate local protection for the resource values of these watercourses and sufficient support for designation by the stakeholders along the river. Finally, it has produced a comprehensive Management Plan, in partnership with the river towns and other local stakeholders that contains detailed recommendations for protecting the resource values of the lower Farmington River and Salmon Brook. The Study Committee therefore recommends that the lower Farmington River and Salmon Brook be designated as part of the Partnership Wild and Scenic Rivers Program.



Morning mist
Photo: Wanda Colman

CHAPTER 3

Implementing the Plan: Role of the Farmington River and Salmon Brook Wild and Scenic Committee

Farmington River and Salmon Brook Wild and Scenic Committee (FSWS)

The Lower Farmington River and Salmon Brook will be managed under the Partnership Wild and Scenic Rivers Program, in which river stakeholders work cooperatively to achieve the goals and priorities in the Management Plan.

Purpose. A non-regulatory advisory committee will be established called the Farmington River and Salmon Brook Wild and Scenic Committee (FSWS). The purpose of the Committee is to lead and coordinate implementation of the Management Plan by:

- Bringing together on a regular basis various parties responsible for river management;
- Facilitating agreements, cooperation and coordination among them;
- Providing a focus and a forum for all river interests to discuss and make

recommendations regarding issues of concern; and (subject to Wild and Scenic River Designation)

- Advising and assisting the National Park Service in implementation of the Wild and Scenic River designation and expenditure of potential federal funding for Management Plan implementation;
- Advising and assisting the National Park Service in the review of potentially adverse federal water resource development projects.

It will also be the Committee's responsibility to monitor the Outstanding Resource Values with respect to the degree they are protected, degraded or enhanced during implementation of the Plan.

It will be vital for the Committee to develop local and regional partnerships with towns and with other conservation organizations to achieve short and long-range plan goals. It will also be the Committee's responsibility to monitor the Outstanding Resource Values with respect to the degree they are protected, degraded or enhanced during implementation of the Plan.

The FSWS Committee will have no regulatory or land acquisition authority. It may advise, complement, or support existing entities that have management or regulatory authority affecting the river, but will have no power to dictate the actions or decisions of those entities.

Responsibilities. The committee will also assume the following responsibilities:

1. **Address river-related issues:** FSWS will pursue cooperative resolution of issues affecting the Outstanding Resource Values (ORVs) and stream flow. While the Committee will not have the authority to resolve any issue directly, it will provide a forum for the discussion of issues, help raise awareness about issues of particular importance, and stimulate needed action. FSWS will be available to evaluate proposals that could affect the ORVs and comment as it deems necessary to the appropriate agencies or organizations. The review of a particular proposal could be initiated at the request of the public or of local, state, or federal officials, or at the Committee's own discretion. It is acknowledged that committee members must recuse themselves from participating in such activities as necessary to avoid conflicts of interest. Examples of proposals that FSWS could choose to review and comment on include but are not limited to:
 - Zoning changes for lands along the river or its tributaries that potentially impact ORVs.
 - Development projects or other land use activities that potentially affect ORVs.
 - Applications for state permits (e.g., point source discharges; water withdrawals).
 - Changes to state programs or policies (e.g., statewide water quality standards).
 - Applications for federal permits (e.g., Army Corps of Engineers Section 404

permits; Federal Energy Regulatory Commission certification for pipeline crossings).

Town boards and commissions will be encouraged to communicate and collaborate with FSWS on matters related to the watercourses, but it will be the Committee's responsibility to stay informed about proposals under local jurisdiction that it could choose to review. Committee members, particularly town representatives, will play an important role in keeping the group abreast of local issues.

The State of Connecticut will be requested to notify FSWS of state or federal permit applications associated with wastewater and stormwater discharges to surface and groundwater, water diversions, water quality certifications, dam construction, flood management and stream channel encroachment, inland wetlands and other potential actions pertinent to protecting the rivers' ORVs. The State will then give the Committee the opportunity to comment.

2. **Review and update the Management Plan:** It is expected that the Management Plan will require regular revisions and updates. Advances in resource management strategies or technology, as well as changes to regulations, laws, policies or programs may require the Plan to be revised. It is recommended that a review be conducted approximately every five years. Minor updates to the Plan should be approved by the FSWS, and the public should be given ample opportunity to participate in the update process. In the event that the Committee determines that a major or significant revision is required (removal or major changes to goals and objectives, significant changes to administrative framework, material changes to Wild and Scenic River provisions, etc.) a full review process similar to that undertaken for the Plan's development and community endorsement should be undertaken.
3. **Promote public involvement and education:** The Wild and Scenic Committee will provide opportunities for the public to learn about and participate in efforts to resolve issues that affect the river. A primary goal of outreach and

education will be to engage community members in protecting and enhancing the ORVs. This may be accomplished through Committee meetings, workshops, newsletters, a website, surveys, mailings, volunteer opportunities, media coverage, school activities, or other measures. The Committee also will support the education and outreach activities of its member organizations and, when appropriate, initiate its own projects to educate the public about the Farmington's and Salmon Brook's special values, the challenges confronting them and sensible techniques for conserving them. In performing these activities, the Committee should reach out to a broad cross-section of the public, including recreational users, visitors to the Farmington Valley, elected and appointed officials at all levels of government, town staff, riverfront landowners and other local residents.

4. **Promote river enhancement initiatives:** With Committee approval, the Committee will support river enhancement projects initiated by its members or other groups. The Committee will seek to coordinate involvement of its members in enhancement efforts.
5. **Disperse funding provided through the cooperative agreement:** As funding is available through the NPS the Committee will be responsible for prioritizing projects to support. The Management Plan will serve as the blueprint for determining the projects that best 1.) Protect and enhance the ORVs, 2.) Promote the stated management goals, 3.) Provide information to member towns' residents regarding the value of protecting and enjoying the

river and brook, 4.) Expand partnerships, and 5.) Leverage volunteer efforts, in-kind services and additional funding. All of the member towns will be eligible to request funding to support ORV related projects that advance plan goals.

6. **Report to the member towns and organizations on the activities of the Committee:** It will be the responsibility of each Committee representative to serve as liaison to their town or organization by communicating on Committee actions, events and business on a regular basis. The representative will also be tasked with bringing reports, issues and potential projects from the town or organization to the Committee. The representative from each town is also expected to serve as a liaison between the Committee and the local land trust.
7. **Prepare periodic status reports:** FSWS will prepare brief annual reports on the status of protection of the watercourses and implementation of the Management Plan. These reports will serve two primary purposes:
 - To report on the condition of the watercourses to the general public, local officials, the Governor and the General Assembly of Connecticut, and, if the Lower Farmington River and Salmon Brook are designated Wild and Scenic, to Congress and the Secretary of the Interior.
 - To publicize any pressing needs or issues requiring attention or assistance from the local, state and/or federal governments.

Educational event for Farmington River town residents

Photo: John Fitts



Committee Core Members

The membership of FSWS will include representatives from nine river towns, other stakeholder groups, and (if designation occurs) the National Park Service. The National Park Service can only become a formal member of FSWS as a result of Congressional authorization through the achievement of a Wild and Scenic River designation.

The following entities constitute the core voting membership of FSWS. Each member will have one representative and one alternate. Each entity will have one vote. Due to the large number of key participants, at this point there can be no additional core members; however, active participation by non-core members will be encouraged.

- Town of Avon
- Town of Bloomfield
- Town of Burlington
- Town of East Granby
- Town of Farmington
- Town of Granby
- Town of Hartland
- Town of Simsbury
- Town of Windsor
- Farmington River Watershed Association
- Salmon Brook Watershed Association
- Pequabuck River Watershed Association
- Stanley Black & Decker

- Connecticut Department of Environmental Protection
- National Park Service

The Town of Canton will be represented on the upper Farmington River Wild and Scenic Committee (see explanation below)

Appointments

Representatives and alternates will be appointed as follows. Where appropriate the Committee may recommend candidates for appointment:

- Town representatives by the town board of selectmen or town council
- Watershed Association representatives by their board of directors
- Stanley Black & Decker as appropriate
- State representatives by the Commissioner of the Department of Environmental Protection
- Department of the Interior representatives by the New England Team Leader, National Park Service

Non-Core Committee Members

The Committee will encourage broad participation from representatives of interested groups that express interest in contributing to furthering the Management Plan goals. A non-core member can be involved with the activities of the committee informally, e.g., through attendance at meetings, participation on a subcommittee or volunteer work on projects, but will not be a voting member.

Study Committee members at work Photo: Joyce Kennedy



The Committee will encourage broad participation from representatives of interested groups that express interest in contributing to furthering the Management Plan goals.

Relation to the Farmington River Coordinating Committee

The Farmington River Coordinating Committee (FRCC) is the advisory group that implements the Management Plan for the upper Farmington River Wild and Scenic segment. The lower Farmington River and Salmon Brook Management Plan will be administered by a separate committee. However there will be opportunities to share resources and funding and to work cooperatively on projects that further the goals of both management plans.

The 1.1 mile river segment that reaches from the New Hartford/Canton town line to the confluence with the Nepaug River in Canton is contiguous to the upper Farmington River Wild and Scenic area and is therefore recommended to be administered as part of the upper Farmington Wild and Scenic River. The proposed 1.1-mile extension of the upper 14-mile Connecticut segment of the upper Farmington River could be under the jurisdiction of the Farmington River Coordinating Committee (FRCC) due to the existing Town of Canton representation as a core member of the FRCC. (see Figure 3: Potential Upper Farmington River Wild and Scenic Boundary and Extension) Once the lower Farmington and Salmon Brook Study is complete, Canton would no longer be represented on the lower Wild and Scenic Advisory Committee. Committee representatives from the Farmington River Watershed Association and CT DEP could serve on both the FRCC and FSWS Committee and act as liaisons between the two groups.

Procedures

Establishment: It is recommended that the Study Committee remain in place until the lower Farmington River and Salmon Brook are designated. Once designation occurs the FSWS Committee can be established. This action will both 1.) provide continuity and continued momentum between the end of the study process and a formal designation and 2.) demonstrate to Congress the high level of partner commitment to the long-term preservation of the river and brook.

With the continued presence of the Study Committee, a number of actions in the Management Plan can be undertaken without delay, through local participation and volunteerism. For actions that will take

significant human, technical, and financial resources to complete, the Study Committee can set priorities for future implementation. In the event of no designation, the Plan will be a significant asset for planning and management, and the Wild and Scenic partners will be strongly encouraged to implement it as much as possible. In taking action, it is important to note that recommendations for local commissions are just that: recommendations. Actual implementation will require all the formal procedures that the town commissions must follow, especially in considering any new regulations for adoption.

Decision-making: To the extent possible, the Committee will operate by consensus. However, for certain issues such as changes to the Management Plan or FSWS bylaws, election of officers, addition or removal of members and expenditures of funds over certain levels, formal votes may be taken.

Officers: The Committee will have four officers: chairperson, vice-chairperson, secretary, and treasurer. The responsibilities of the officers will be established in the Committee's bylaws. The National Park Service representative cannot serve as Committee chairperson.

Bylaws: The Committee will develop and enact bylaws for other procedural issues.

Memorandum of Understanding: FSWS members may establish an agreement outlining the cooperative commitment among its members to participate in the long-term management of the river and to implement those parts of the Management Plan under their existing traditional jurisdiction or to which they have been assigned specific responsibility.

Funding/Staff

To fulfill the responsibilities identified above, FSWS will likely require direct funding and possibly in-kind assistance. Funds may be needed to (1) hire staff to coordinate the Committee's activities (2) undertake specific projects, and/or (3) cover costs related to FSWS' general operations and activities. For example, the Committee may need funds for office space and equipment, for printing and distribution of information or for education and outreach efforts.

If the watercourses are designated as a part of the National Wild and Scenic Rivers

System, Congressional appropriations will be sought to assist with the establishment and initiation of FSWS. If adequate funding is forthcoming, the NPS could provide its own personnel as the necessary staff support, or transfer money to FSWS through the use of a formal cooperative agreement. (Cooperative agreements are discussed below.) In addition to providing staff support and/or direct financial assistance the NPS may provide technical planning and river conservation assistance to the Committee and its members if such help is requested and if sufficient appropriations are available.

FSWS is encouraged to leverage any federal funding provided to maximize the impact of such funds. FSWS may wish to pursue financial assistance and/or in-kind contributions, such as office space or, equipment, from individuals, foundations, corporations or governmental bodies at the federal, state, and/or local level. In pursuing funding from any of these sources, the FSWS will avoid situations where it could be competing directly for funds with one or more of its member organizations.

Since the inception of the Partnership Wild and Scenic Rivers management model, river partners have been successful in leveraging scarce resources to implement their respective river management plans. By leveraging funds from the private sector, local, state, and federal governments, the river partners have attained a level of river management that would not be possible with government-only support.

Cooperative Agreements between FSWS and the NPS

Cooperative Agreements are formal written agreements between NPS and a local partner to enable the distribution of federal funding or other federal assistance for supporting the implementation of the Wild and Scenic management plans. In this situation, the local partner would act in essence as the fiscal agent for FSWS and NPS, a legal necessity because FSWS is not an incorporated body. Decisions on how funds would be allocated, if they become available, would remain with FSWS in consultation with NPS.

If Wild and Scenic designation occurs, NPS may enter into formal cooperative agreements with FSWS (if it were to incorporate), or any of FSWS' member organizations that are

incorporated. This complies with Sec. 10(e) and/or Sec. 11(b) (1) of the Wild and Scenic Rivers Act. For other Partnership Wild and Scenic Rivers in New England, cooperative agreements have typically been established with local non-profit organizations, such as a land conservation group or a watershed association. For example, during the Farmington River and Salmon Brook Wild and Scenic Study a Cooperative Agreement was established between the Farmington River Watershed Association and NPS to distribute funds for study purposes. The local Study Committee determined how funds were used in the context of study needs and priorities.

The following passages from the Wild and Scenic Rivers Act describe the basis for this arrangement.

Section 10(e):

The federal agency charged with the administration of any component of the national wild and scenic river system may enter into written cooperative agreements with the Governor of a State, the head of any State agency, or the appropriate official of a political subdivision of a State for State or local government participation in the administration of the component.

Section 11(b) (1):

The Secretary of the Interior . . . shall assist, advise, and cooperate with States or their political subdivisions, landowners, private organizations, or individuals to plan, protect, and manage river resources. Such assistance, advice and cooperation may be through written agreements or otherwise . . . Any agreement under this subsection may include provisions for limited financial or other assistance.

The Partners

The Partnership Wild and Scenic Rivers program requires a clear understanding of partner roles and responsibilities for implementing the long-term management strategy for the river system. Main partners include landowners, towns, the state, stakeholders and the National Park Service if designation is achieved.

Partner roles are outlined as follows:

Landowners: The voluntary participation of local landowners is considered key to overall management plan success. Landowners face no new regulations or mandates as a



Photo: Tom Cameron

Since the inception of the Partnership Wild and Scenic Rivers management model, river partners have been successful in leveraging scarce resources to implement their respective river management plans.

result of this Plan or as a result of the Wild and Scenic River designation. However, it is hoped they will be supportive of land stewardship practices that are consistent with the Management Plan and the spirit and goals for protecting the Outstanding Resource Values (ORVs). Examples of desirable practices include chemical-free lawn management, promotion and care of native riverbank vegetation, control of erosion and management of invasive species. FSWS can provide landowners with information and technical tools as needed for good stewardship.

Towns: The plan calls for each town to be an active, voluntary participant in FSWS and in protecting the ORVs. Local land use commissions have done an outstanding job establishing conservation-oriented regulations and policies that make this river system suitable for a Wild and Scenic designation. Their involvement has been essential in developing this Management Plan and its recommendations to town land use commissions and other town entities. Towns are asked to be core members of the FSWS Committee by appointing a member and alternate to represent their interests and be responsible for communication between the town and the Committee.

State of Connecticut: Like the towns, the state is included as an active participant in FSWS, working with all the partners to implement the Management Plan. The State would appoint a core member and an alternate to FSWS. The CT Department of Environmental Protection has distinct roles in managing water quality, water diversions and discharges into waterways, among many other things. They are a leader in open space conservation through policy and funding decisions. The CT Department of Transportation manages many miles of road in the river corridor. Roads potentially have profound effects on local water quality and aquatic health, so the state will need to consider their effects on the ORVs. When making planning, policy, permitting or management decisions that may affect the ORVs of the Farmington River and Salmon Brook, the state is required to take into consideration the goals and recommendations established in the Plan. Thus it will fulfill the obligations of the 2008 bill passed by the General Assembly, supporting designation of the Lower Farmington River and Salmon

Brook as a component of the National Wild and Scenic Rivers System. This bill commits the state to cooperation in implementing this Management Plan. (Public Act No. 08-37, An Act Concerning Designation of the Lower Farmington River and Salmon Brook Within the National Wild and Scenic Rivers System).

National Park Service (NPS): If the Wild and Scenic River designation is achieved, the NPS will coordinate any funding that is authorized by Congress for use in implementing the Management Plan. The NPS will take an active role on FSWS and, as funding allows, provide staff support to coordinate Committee activities as requested by FSWS.

In addition, the NPS will represent the Secretary of the Interior in fulfilling the legislative mandates of the Wild and Scenic Rivers Act. The NPS will review proposed projects that require a federal permit or use federal funding. Any such projects will be evaluated for consistency in protecting and enhancing the ORVs which make the streams appropriate as components of the Wild and Scenic Rivers System.

There are no new regulatory permits associated with the designation. The National Park Service conducts its reviews through existing federal regulatory programs, such as permitting under the Clean Water Act by the US Army Corps of Engineers or the US Environmental Protection Agency, and through the processes required by the National Environmental Policy Act which provides for environmental impact reviews of proposed federal actions.

Watershed Organizations: The Farmington River Watershed Association (FRWA) and the Salmon Brook Watershed Association (SBWA) will play key roles in guiding the FSWS both because of their comprehensive knowledge of local issues associated with the watercourses and because of their ongoing work in protecting and enhancing the ORVs. Each watershed organization will appoint a core member and alternate member to the committee.

Stanley Black & Decker (SBD): As owner of the Farmington River Power Company (FRPC) that manages the hydropower operation at Rainbow Dam, SBD is a major stakeholder on the lower Farmington River

It supports and enhances the quality of life residents have come to expect...

and there will be a SBD representative on the FSWS Committee. Though the Rainbow Dam and adjacent river segments will be excluded from the Wild and Scenic designated area, the FRPC's role in managing river flow significantly influences the lower river. The Power Company calls for upstream flows for the hydro operation based on an existing riparian rights agreement and dictates the amount of water that passes through the hydropower turbines over a 24-hour period of time. SBD is required at all times to release at least 120 cfs downstream to maintain adequate river flows below the Rainbow Dam. SBD takes pride in their river stewardship and production of a local clean energy source.

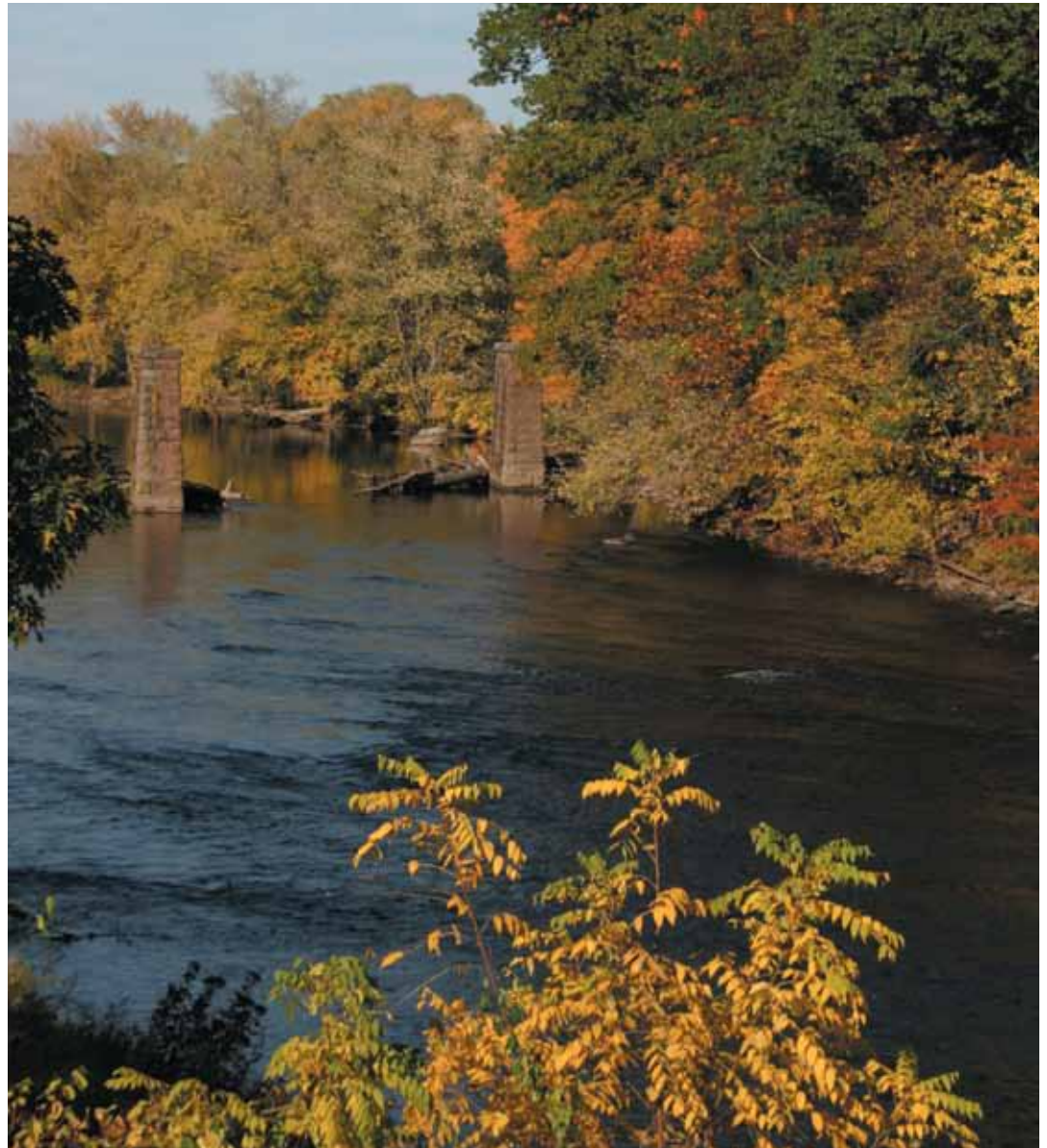
Summary

All phases of developing and implementing the Lower Farmington and Salmon Brook Management Plan, and establishing FSWS,

place strong emphasis on engaging a variety of stakeholders on the local level, using or modifying existing local regulations, leveraging local support, and tapping local knowledge. In this, the study process is typical of the approach taken by other Partnership Wild and Scenic Rivers, and is an approach which has had marked success on the upper Farmington River. It supports and enhances the quality of life residents have come to expect, while ensuring that communities remain in control of their land.

If designation of these watercourses as part of the Wild and Scenic River System is delayed or is not adequately funded, this Management Plan remains a valid and useful tool for the region's communities, agencies, and stakeholder groups, whose commitment to good river management has already been demonstrated.

Tariffville bridge abutments
Photo: Wanda Colman





Confluence of Farmington and Pequabuck Rivers

Photo: Charles Leach

CHAPTER 4

Protecting the Outstanding Resource Values of the Lower Farmington and Salmon Brook Study Area

Introduction

This section of the Management Plan provides recommendations to achieve long-term protection and enhancement of the lower Farmington River and Salmon Brook's Outstanding Resource Values (ORVs). The information provided in this section includes:

- A summary of each Outstanding Resource Value (ORV).
- The protection goal for each ORV.
- Known and potential threats that degrade the quality of each ORV.
- Current protection measures in place for each ORV.
- Gaps in the current protection mechanisms.
- Wild and Scenic Rivers Act Protection of ORVs.

Overview of Study Area

The lower Farmington River presents a sharp contrast to its upper reaches in Massachusetts and northern Connecticut. The upper river is generally narrow, swift, and steep-sided, but as it reaches the beginning of the Study Area in Canton and Burlington the river broadens and slows, flowing southeast toward the lowlands of Farmington. In mid-Farmington,

the river's route is blocked by glacial deposits, and it turns sharply north, traversing Avon and Simsbury along an ancient lakebed. This reach of the river is called the "bathtub" because of its relatively placid flow and broad valley, bounded on the east by a traprock ridge. At Tariffville, the river dramatically exits the "bathtub," punching southeast through a notch in the ridge, then meanders through Bloomfield, East Granby and Windsor before finally entering the Connecticut River (see Figure 6: Elevation and Topography).

Salmon Brook resembles the upper reaches of the River, in that it starts in the western highlands of the Study Area and is generally narrow, swift, and has steep sides. The headwater of the West Branch is in Hartland near Sunset Road. The East Branch extends into Granville, Massachusetts; however, for the purpose of this Management Plan and

Wild and Scenic designation, the state line represents the terminus of the East Branch. Salmon Brook flows southeast through Hartland, Granby, and East Granby and has three distinct segments: the main stem, approximately 2.4 miles long; the West Branch, approximately 12.6 miles; and the East Branch, which is approximately 11.4 miles. Salmon Brook joins the Farmington River in East Granby, above the East Granby/Simsbury town line.



Photo: Tom Cameron

A journey downstream along the lower Farmington River corridor reveals a remarkable array of natural, recreational, and cultural features. Downstream from Canton, the Farmington forms the boundary between Burlington and Avon, then angles into the town of Farmington. Along this stretch the river provides excellent recreation. A CT DEP Trout Management Area extends from below the Lower Collinsville Dam in Canton to the Route 4 Bridge in Farmington and attracts many anglers. The Farmington River Trail, a very popular multi-use rail trail, runs along this same reach.

In Farmington, as the river turns from southeasterly to northerly flow, it is joined by a major tributary, the Pequabuck River. Here the corridor passes through broad, rich lowland that borders extensive wetlands, and features a number of archaeological sites, recreational trails, agricultural fields, and community gardens. The names of several tracts of open space along the river in Farmington and north into Avon, e.g. Tunxis Mead, Meadow Land, Tunxis Plantation, and Fisher Meadow, indicate the river's extensive

floodplain, still relatively undeveloped despite the area's long history of settlement.

Continuing northward in Simsbury along an old glacial lakebed, the river corridor skirts the base of the traprock ridge that includes Talcott Mountain (see Figure 8: Traprock Ridges). On either side of the main channel, old oxbows and meander scars are scattered through farmlands and wetlands. Placid flow, easy access points, abundant open space, and many wildlife viewing opportunities make this a favorite stretch of the river for canoeing, kayaking, and rowing as well as fishing. The Farmington Canal Heritage Trail, commemorating one of the most remarkable engineering projects of the nineteenth century accompanies this stretch of the river.

At the far northern end of the "bathtub" in East Granby, the Farmington is joined by Salmon Brook, arguably the most important tributary of the lower Farmington for its high-quality resources. The corridors of Salmon Brook's East and West Branches and its mainstem have a higher percentage of forest cover than that of the lower Farmington. The forested land provides water filtration, shade, and tree debris to the Brook, resulting in clean, cold water, good fish habitat, and excellent angling. (see Figure 4: Land Cover)

After the confluence with Salmon Brook, the Farmington River turns southeast again, along the East Granby/Bloomfield town line, and its character changes abruptly to world-class whitewater as it charges through the traprock ravine known as Tariffville Gorge. Once a site of hydropower generation for Hartford, the Gorge is now a destination for top-level whitewater kayakers from all over North America. Below the Gorge the river enters the impoundment behind Rainbow Dam, a present-day hydropower facility owned by Stanley Black & Decker and operated by the Farmington River Power Company. Below Rainbow Dam and its fish ladder, the river winds between natural levees and belts of riparian forest along the historic tobacco fields of Windsor before finally joining the Connecticut River.

Overall, the Lower Farmington River and Salmon Brook corridors are a remarkable combination of varied geology, healthy forested watershed, spectacular fishing and paddling areas, well-kept walking and biking

Regionally Significant in the Study Area are the time span covered by the geology and the diversity of geologic features

trails, diverse communities of plants, wildlife, fish, and aquatic invertebrates, rich agricultural bottomlands, archaeological sites, historic towns and landmarks, and striking scenic views. Because of its abundant amenities, the study area is subject to development pressure. (see Figure 5: Land Use) A coordinated Management Plan that ensures sound land use and river management is essential to preserving the outstanding resources of the Farmington River and Salmon Brook.

Description of the Potential Wild and Scenic Segments (see Figure 2: Potential Wild and Scenic Segments):

1. **Lower Farmington River:** This segment begins at the New Hartford/Canton town line and concludes at the confluence of the Farmington and Connecticut Rivers. The river segments that include the Upper and Lower Collinsville Dams and the Rainbow Dam and impoundment are proposed to be excluded from the designated area. The segment of river upstream of the Upper Collinsville Dam is proposed to become part of the Upper Farmington Wild and Scenic River (see Figure 3: Existing Upper Farmington Wild and Scenic Boundary and Extension).
2. **Salmon Brook:** The Eastern Branch Salmon Brook begins at the Connecticut/Massachusetts state line in Granby and

continues to the confluence with the mainstem and the Western Branch of Salmon Brook in Granby. Western Branch Salmon Brook begins at an unnamed impoundment approximately 850 ft south of Sunset Road in Hartland and continues to the confluence with the mainstem and the Eastern Branch of Salmon Brook. The Salmon Brook mainstem continues from the confluence with the Eastern and Western Branches to the confluence with the Farmington River in East Granby.

Outstanding Resource Value: Geology

Overview

Geology was considered on a broader scale than the other Outstandingly Remarkable Values (ORVs) due to the scale of the mechanisms that produced the varied geology of the Study Area over a long period of time. The role that watercourses and glaciation had in forming the landscape of the Farmington River Valley is evident in the path of the river, development patterns and land uses, making geology a defining element that supports some of the other ORVs. The ORVs including Water Quality, Biodiversity, Cultural Landscape and Recreation are all tied to the region's geology. For example, the chemistry of Traprock provides atypical nutrients to support unique vegetation. Also, spectacular vistas and

Some key findings on the exemplary status of Geology of the lower Farmington and Salmon Brook:

- The glacial diversion of the Farmington River from its probable original path to New Haven northward through the Tariffville Gorge is a classic glacial diversion which is unique in Connecticut.
 - Rare plant and animal habitats associated with geologic features such as the Traprock Ridge, the Tariffville Gorge and the Sandplains.
 - A billion year time span of earth history and broad diversity of features within a 35.1 square mile area.
 - The alluvial soils that formed under glacial Lake Hitchcock and glacial Lake Farmington which are among the best farmland soils of the United States. Due to the glaciation history it has the highest soil diversity in Connecticut and one of the most complex soil systems in the United States. There are over 200 different soil types in Connecticut, 50 percent are represented in the Farmington River Valley. In turn, the biodiversity and habitat complexity of the Study Area is strongly influenced by this soil complexity. One of the original soil surveys was conducted in 1899 to promote tobacco cultivation in the lower Farmington Valley.
-

... a billion years of earth history are contained in a 35.1 square mile area!

recreational opportunities are associated with the Traprock Ridges, and gaps in the ridges were historically important because they provided pathways for east-west commerce before motorized transport. Many of these historic routes are still in use today.

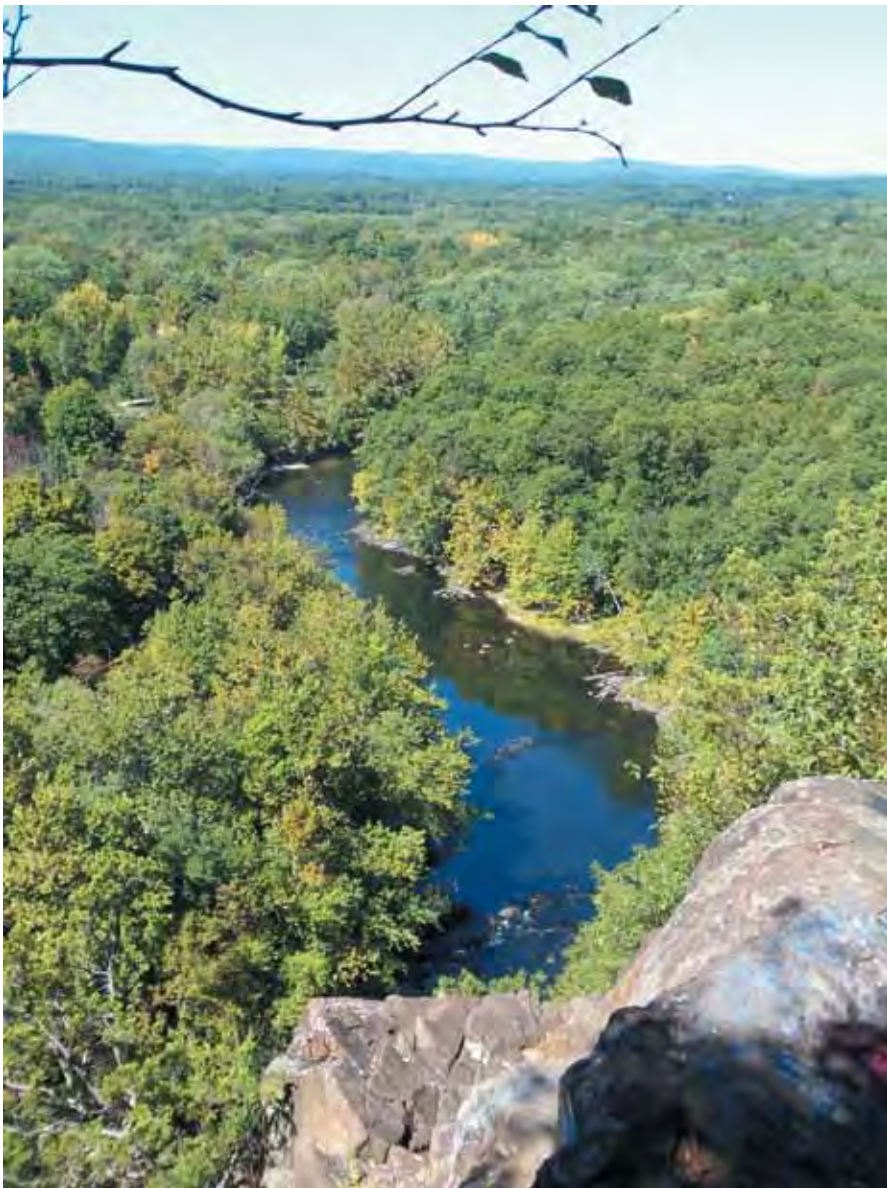
In order to fully understand the significance of the geology within the Study Area, it is important to go back in time to follow the natural progression to the current outstanding geologic resources within the Study Area. The northwest to southeast traverse of the Wild and Scenic Study Area reveals bedrock units that range in age from the billion year old metamorphic gneisses and schists of western Hartland to the 200 million year old dolerites, basalts (traprock) and arkoses (brownstone) of Granby, Simsbury, Avon, East Granby, Bloomfield and Windsor (see Figure 7: Generalized Bedrock Geology). One of the rare (there are only three) true granites of Connecticut, the 400 million year old Nonewaug, occupies the northwestern corner of Burlington. Just to the east, the metamorphosed remains of the Shelburne Falls Arc, an ancient, Japan-like, volcanic island arc, extend northward from Burlington to the Massachusetts line in Granby. The glacial deposits that mantle the bedrock yield evidence of the two glaciations that are known to have occurred, and the fertile modern floodplain of the Lower Farmington runs northward from Farmington to the Simsbury-East Granby line. Thus, roughly a billion years of earth history are contained in a 35.1 square mile area!

The present configuration of the bedrock units that underlie the Study Area developed from west to east in two stages: first, the convergence of the Proto North American and African continents as the intervening Iapetos Ocean closed, and the supercontinent of Pangaea was assembled; second, the subsequent breakup of Pangaea and the formation of the Atlantic Ocean as Africa and North America diverged. The closing of the Iapetos Ocean, as the ancient African and North American continents converged and collided, was initiated about 500 million years ago. The crushing, heating and mountain building associated with this convergence assembled and metamorphosed the bedrock units that now underlie the area west of the Hartford Basin. A series of faults known as Cameron's Line delineates the boundaries

of two bedrock groups that were joined together and metamorphosed as the Iapetos Ocean closed (see Figure 7: Generalized Bedrock Geology). The former eastern margin of North America is represented by the billion year old gneisses and schists to the west of Cameron's line. Remnants of the Iapetos Ocean in the form of metamorphosed deep ocean sediments and a portion of the Shelburne Volcanic Island Arc underlie the area between Cameron's Line and the Hartford Basin.

The 200 million year old rocks of the Hartford Basin are relative newcomers to the region. They could not form until the supercontinent of Pangaea began to break apart around 250 million years ago. By then, the forces that caused the continents to converge had reversed, and Africa and North America had started to move away from each other. A similar process is pulling the East African Rift Valley apart today.

The tension produced by the diverging continents created tears in the earth's crust. The main tear developed just to the east of Connecticut, where the Atlantic Ocean formed along this rift zone. Secondary tears, like the Hartford Basin, had also developed all along the east coast of North America, but these rifts failed before they could create oceans. This was lucky for Connecticut, otherwise Tolland would be part of Africa, and Canton would be part of our east coast. Faults that defined the Hartford Basin deepened as the rift valley developed and layers of sediment began to accumulate. Eventually the faults penetrated deep enough to intersect magma and periods of volcanic activity punctuated sedimentation. Some of the magma cooled underground forming the Barndoor Hills and Onion Mountain, which are composed of a kind of traprock referred to as dolerite or diabase. West Suffield, Penwood and Talcott Mountains are also composed of traprock in the form of basalt which originated from molten rock that flowed across the surface of intervening sedimentary layers in the form of lava. These basaltic ridge lines have distinctive steep scarps on their western flanks and more gentle slopes to the east (see Figure 8: Traprock Ridges). Variations in the color of the sedimentary rock layers indicate they were deposited during rainy periods (black to grey layers) that alternated with drier periods (tan to red layers).



**View from New England
National Scenic Trail**
Photo: Paula Jones

A journey downstream along the lower Farmington River corridor reveals a remarkable array of natural, recreational, and cultural features.

The sequence of events that emplaced the bedrock of the Study Area resulted in a distinct north-south alignment of major faults and bedrock units. During the nearly 200 million years since the development of the Hartford Basin, bedrock units of varying resistance to weathering and erosion were exposed to freeze and thaw and stream action. Fault and fracture zones and less resistant rock units were preferentially removed forming valleys and lowlands while more resistant rock remained as ridges. By the time that the first of the two known glaciations began, about 150,000 years ago, a well developed south flowing drainage system had developed. This bedrock-controlled drainage system was rounded and smoothed by the glaciers, but the overall north-south alignment of the bedrock-controlled hills and valleys was not significantly altered. The enduring influence

of the region's distinctive bedrock fabric can be seen in the transportation system and cultural features that have developed amongst the ridgelines and picturesque valleys that still typify the landscape.

Evidence that at least two glaciations occurred in Connecticut comes in the form of the two tills, of different ages, that are commonly found in drumlins. Since till is a glacial deposit, the existence of an older till and a younger till requires the presence of two distinct ice sheets. The vast majority of glacial deposits in the Study Area were deposited between about 26,000 and 15,000 years ago, during the last glaciation known as the Wisconsinan. These deposits exist in two forms, till and meltwater deposits.

Till is deposited directly from the ice and is typically a mixture of all of the debris that the ice contained, large boulders to very fine sediment and everything in between. Till, which is commonly exposed in upland areas, is often "bony" and impermeable making it poor for aquifers and not suitable for septic systems. It is the reason that many New England farmers "went west." Water is a better sorting agent than ice, so meltwater deposits tend to fill valleys with layered clays, sands and gravels that were deposited in glacial lakes and ponds or meltwater streams. These deposits are often fairly flat, good sources of aggregate, good aquifers and more suitable for development than till (see Figure 10: Quaternary Geology). Deposits of finer materials—silt and clay—commonly underlie the area's many wetlands. Glacial Lakes Farmington, Tariffville, Hitchcock and the northwest end of Glacial Lake Middletown once occupied the lowlands that flank the resistant traprock ridges of the Hartford Basin (see Figure 11: Glacial Lakes). As these lakes drained away, their easily eroded, broad, flat surfaces afforded ample opportunity for the fertile modern floodplain of the Lower Farmington to develop.

Landscapes and Cultural Influences

Landscape features have played an important role in shaping the course of cultural development within the Study Area. Early on, steep narrow valleys afforded opportunities for hydropower while broad lowlands were more amenable to agriculture. The influence of the landscape can still be seen in the layout of the highway system and in the distribution of population and commercial centers. Much



Simsbury residence constructed from Ketchin's Quarry sandstone
Photo: Sally Rieger

of this relates back to the character of the underlying bedrock. Bedrock units that are resistant to the ravages of weathering and erosion tend to form the underpinnings of uplands and ridge lines while less resistant units, and fault/fracture zones, commonly underlie valleys and lowlands.

Hartford Basin:

The Hartford basin provides an excellent example of the role that rock type plays in landscape development. The resistant traprock (diabase and basalt ridges) stands

in sharp contrast to the low-lying layered sedimentary bedrock. The traprock forms prominent outcrops and the shape of the bedrock surface controls the configuration and character of the ridges it forms. Owing to the way traprock weathers, steep talus-strewn slopes often flank ridge tops that have little soil or glacial cover. These opposing settings provide ecological niches related to the warmer and drier conditions at the top and cooler and wetter conditions on ridge flanks. Traprock chemistry can also provide atypical nutrients to support vegetation (see Biological Diversity Chapter).

In addition to the spectacular vistas and recreational opportunities associated with the traprock ridges (see Recreation Chapter), gaps in the ridges provided pathways for east-west commerce and hydropower development. For example, a carpet mill on the river in the Tariffville Gorge harnessed the energy of the river.

The lowlands surrounding the traprock ridges are underlain by layered sedimentary rocks that are generally much less resistant to weathering and erosion than the traprock. As the last glacier melted northward, the lowlands filled with a succession of glacial lakes and thick accumulations of glacial lake sediment buried the bedrock surface. Where

Examples of Diverse Geologic Features

- The Newgate Prison and Mine in East Granby which opened about 1705 and was one of the first mines in the British Colonies.
- Brownstone quarries in Simsbury which provided building stone for the present town hall, Central School, the Methodist Church and the buildings of Ensign Bickford, (now Dyno-Nobel).
- The Traprock Ridges that represent lava flows in a rift valley make the Hartford Basin unique in New England. There are few Traprock Ridges found in North America with one other example being the Palisades of New York.
- One of the rare (there are only three) true granites or igneous rocks of Connecticut, the 400 million year old Nonewaug, occupies the northwestern corner of Burlington.
- The metamorphosed remains of the Shelburne Falls Arc, an ancient, Japan-like, volcanic island arc, extend northward from Burlington to the Massachusetts line in Granby.
- Bedrock units that range in age from the billion year old metamorphic gneisses and schists of western Hartland to the 200 million year old dolerites, basalts (traprock) and arkoses (brownstone) of Granby, Simsbury, Avon, East Granby, Bloomfield and Windsor.

Lower Farmington River and Salmon Brook study area has the highest soil diversity in Connecticut and one of the most complex soil systems in the United States.

the glacial lakes existed, there is little surface expression of the underlying bedrock, and few outcrops, because of the thick glacial cover. The landscape is essentially drained lake bed which has been cut into and modified by modern streams. The Farmington was diverted northward across drained lakebed as the ice melted back. Its outlet became the gap at Tariffville. Once the lake beds were exposed, windblown sediment accumulated and dune fields developed. These sandplains are ecologically important today because they support rare plant communities (see Figure 12: Sand Plains and Inland Dunes and Biological Diversity Chapter).

The broad, flat, fertile lowlands provided a nice tillable contrast to the rugged uplands west of the Hartford Basin. They harbored the alluvial soils that supported the cultivation of tobacco, an economic driver for the area and the basis of a lucrative international trade (see Cultural Landscape Chapter).

Although the sedimentary bedrock of the Hartford Basin was largely hidden, some of the accessible brownstone, a type of sandstone, was quarried in the Farmington Valley towns. For example, the Ketchin Quarry in Simsbury, donated to the Simsbury Land Trust by the Ensign-Bickford Corporation, provided the stone for the Belden Building (now town hall), the Methodist church, and other local buildings. (For a list of mines and quarries in the Study Towns, see Appendix 1: Geology).

Western Uplands:

Except for the 200 million year old sedimentary rock of Canton's Cherry Brook

Basin, fairly resistant metamorphic bedrock (primarily gneisses and schists) is at or near the ground surface, and therefore controls the shape and character of the landscape, throughout the upland areas west of the Hartford Basin. The juxtaposition of aligned rock units, folds, faults and fractures, and their varying resistance to eons of weathering and erosion, have produced an overall north-south pattern of ridges and valleys. The steep gradients and numerous pinch points that typify the upland topography afforded ample opportunity for impoundments that provided hydropower (in Collinsville for the Collins Axe Factory), and drinking water (Barkhamsted and Nepaug Reservoirs behind the Saville Dam and Nepaug Dam, respectively).

Owing to the thin glacial cover (mostly till) on the ridges, bedrock outcrops that were capable of yielding a variety of useful stone products were plentiful. The glacial meltwater deposits that filled the valleys were much more suited to development than the till-covered uplands. These layered sands and gravels typically provide plentiful groundwater, sources of aggregate and hospitable settings for roadways and settlement.

From an ecological standpoint the sweet soils associated with the calc-silicate rocks of the amphibolite ridges provide a contrast to the acidic soils typically associated with metamorphic bedrock.

Soils

Because of the Valley's geologic and glacial history and its location at the junction of Connecticut's Western Highlands and Central

**Rosedale Farm and Vineyard,
Simsbury** Photo: Wanda Colman



Lowlands, the Lower Farmington River and Salmon Brook study area has the highest soil diversity in Connecticut and one of the most complex soil systems in the United States. There are over 200 different soil types in Connecticut, fifty percent are represented in the Farmington River Valley. In turn, the biodiversity and habitat complexity of the Study Area is strongly influenced by this soil complexity.

The acidic soils of the Western Highlands developed on glacial till composed of ground up granites, gneisses and schists. Less acidic soils are present in the Central Lowlands formed on the clay, silt, sand and loess deposits associated with the ancient glacial meltwater of Lake Hitchcock. This complex of parent materials has strongly influenced the variety of soils present in the Study area.

Soil patterns dictated the early land uses and land cover. The shallow soils on upland rocky till substrates were not conducive to intensive agriculture, but have supported grazing or forestry. Early colonists found the valleys had an extensive history of agriculture by the Native Americans and agriculture has continued to be a dominant land use for the valley soils formed on the glacial and alluvial (water borne) parent materials. Areas underlain by relatively impermeable silts and clays layers have formed the wetlands soils we have today.

Connecticut soils are relatively well known. One of the first soil surveys in the US was done in 1899 in relation to tobacco cultivation here. Connecticut is now in its 4th generation of soil surveys. Connecticut's State Soil, the Windsor Soil series, is found throughout the Study area (see Figure 13: Windsor Soil Series). Windsor soils are the preferred soils for the production of shade tobacco, used as outer wrappers for some of the world's finest cigars. Windsor soils are well suited to the highly diversified agriculture of Connecticut such as the production of fruit and vegetable crops, silage corn, and ornamental shrubs and trees.

Because of the sandy/gravelly characteristics of soils in many parts of the Study area and shallow depth to water table, groundwater supplies are very accessible but also very susceptible to damage. The alluvial soils in the Farmington floodplain and the terrace escarpments along portions of the Farmington Valley may be easily erodible.

River bank stabilization or management of any terrace escarpments is necessary to prevent siltation of the fresh water mussel habitat in the river bed as well as other aquatic species.

To ensure the preservation of agricultural soils and farming operations in the Study Area, farm-friendly municipal regulations and sound soil management practices are needed. The agricultural soils in the Study area currently provide locally produced food. (see Figure 14: Prime and State Farmland Soils) The cost of energy for transportation is making the economics of locally grown food more and more attractive along with the value placed on freshness and contributions to local economy.

Geology Protection Goal

Protect geological features that are important as agricultural, cultural, hydrologic, or recreational resources or that are the basis for natural ecological functions or that serve significant scientific or educational purposes.

Threats to Geological Resources

Development pressure is a threat to geological resources in all ten study area towns. Development activities can cause changes to hydrology by altering the slope and topography of the landscape, lead to erosion and sedimentation, and result in loss or substantial alteration of important bedrock and glacial features. In the more developed towns where developable land is relatively scarce, development pressures have shifted to more difficult sites such as traprock ridges. Ridgeline sites are particularly sensitive environmentally because they frequently support rare plant and animal populations or are part of wildlife corridors. Although there are many surficial glacial features in the Study Area, development may alter or remove particularly significant examples of drumlins or eskers or fill in glacial remnants like kettle holes. In towns where farmland is available for development, loss of productive agricultural soils to development is a significant threat because land with those soils is often flat and suitable for business, industrial and/or residential development (see Agricultural Soils Protection, below, for material specifically related to protecting agricultural soils).

In addition to development, earth material extraction, such as gravel mining operations or quarrying, may threaten the bedrock

Protecting existing farms and making suitable town land available for farming is critical to protecting valuable agricultural soils.

and surficial geological features within the watershed as well as the water quality, biodiversity, cultural history and recreational opportunities of the area.

Current Protections, Protection Gaps and Improvement Opportunities

Development: Geological resources do not enjoy the level of regulatory protection accorded to endangered species or wetlands, but some protections are in place. All ten towns require soil and erosion control measures that pertain to the development process. Towns that do not cite the most up-to-date Soil and Erosion Control Guidelines from the Connecticut Department of Environmental Protection should update their regulations to cite the latest edition in order to protect both water quality and valuable topsoil.

In some towns, there are special protections in place for traprock ridges, ridgelines and hilltops. In some cases, these regulations pertain to the protection of ecological function as well as the protection of viewsheds. Given that the area's traprock ridges harbor plant and animal species not found elsewhere in the study towns, support productive vernal pools, provide a corridor for wildlife movement and shelter recreational trails, including sections of the New England National Scenic Trail (also known as the Metacombet-Monadnock-Mattabasset Trail), they merit protection not only for their scenic beauty but also for their important environmental and cultural roles.

By placing more emphasis on regulations that maintain the ecological functions of ridges and hilltops, the study area towns could protect special habitats, wildlife corridors and hydrology along with the scenic beauty of the area. The regulation review conducted by Robinson and Cole (see Appendix 8), provides more detailed guidance to specific towns on opportunities for regulatory changes to enhance protection of hilltops and ridges.

Development on steep slopes is another area of regulatory concern (see Figure 15: Steep Slopes). The suitability of a steep slope for development depends on the stability of the soil, the site's drainage patterns and the effects of development on them, the potential for erosion with sedimentation into watercourses, possible flooding issues and safety. The study area towns do not all address steep slopes in their regulations. Towns without current

regulations have the opportunity to develop and enact new regulations, in accordance with state statutes, to help manage development while protecting the public's interests. Towns with existing steep slope regulations might review them and update them as needed, depending on soil types and other local characteristics. While the State of Connecticut does not offer model regulations for steep slopes, guidance is available through the Center for Land Use Education (CLEAR) and NEMO associated with the University of Connecticut's Cooperative Extension System.

Earth Materials Extraction: All ten towns have regulations pertaining to removal of earth materials from their original location. The variation in the regulations is considerable and is affected in part by the perceived threats within each community. For example, East Granby, the only town with an active traprock quarry, has a quarry zone. While it is clear that all potential geological resources cannot be left in their natural condition, certain outstanding resources that may not yet be identified specifically in town regulations deserve conservation.

Agricultural Soils Protection: Good agricultural soils are an essential resource readily lost through development. They are vital to the production of fresh local produce, in which there is a growing public interest. Increasing concern about the health and environmental costs of industrial farming has made the viability of Connecticut's farms a matter of significant community interest. Protecting existing farms and making suitable town land available for farming is critical to protecting valuable agricultural soils. For a "how-to" guide on farmland protection, see *Planning For Agriculture: A Guide for Connecticut Municipalities*, a publication of the American Farmland Trust and Connecticut Conference of Municipalities. This volume provides information for towns, organizations and citizens about the economic, fiscal, cultural, environmental and recreational values of Connecticut farms, gives advice on town planning and regulatory possibilities for farm protection and lists of sources of assistance and funding. It is available online at www.ctplanningforagriculture.com

Open Space Conservation as a Way to Protect Geological Resources

Because geological resources are not as highly regulated as some other natural resources,

The landscape of the Farmington Valley is sculpted by the dynamic behavior of rivers and streams.

open space designation has been and should continue to be an important tool in their protection. There are many examples of open space safeguarding special geological features. Land that belongs to the State of Connecticut, to the study area towns and to various conservation organizations provides a patchwork of protection (see Recreation ORV). At the state level, Talcott Mountain State Park and Penwood State Park protect traprock ridges. Marion K. Wilcox Park in the Town of Bloomfield abuts Penwood and extends protection of the traprock ridge. The Town of Simsbury has conserved a significant esker in West Simsbury, with the Simsbury Land Trust owning and protecting the adjacent bog. The Town of Granby's ownership of Holcomb Farm in West Granby has conserved an especially steep-sided esker and also alluvial soils along Salmon Brook and Kendall Brook that are used for growing produce in a Community Supported Agriculture project. McLean Game Refuge, with 4000+ acres in Granby, Simsbury and Canton safeguards a section of traprock ridge, and a variety of glacial features. In 2000, the Town of Farmington purchased a dairy farm that it rents out to a working dairy and received \$75,000 in Agriculture Viability Grants to improve structures on the property (*Planning For Agriculture: A Guide for Connecticut Municipalities*, p. 28).

While fee-simple ownership of land with conservation deed restrictions provides the strongest protection, some important geological features such as farmland soils have been protected through conservation easements or purchases of development rights. This allows the farmer to keep farming and provides funds for improvements to the farm, but prevents sale of the land for development. One local example is Rosedale Farm in Simsbury, which has prime agricultural soils and is located on the banks of the Farmington River in Simsbury. The farm has been permanently protected from development by Simsbury Land Trust's purchase of development rights. The land trust would not have been able to accomplish this protection without the efforts of its members, the Epstein family which owns the farm, the Hartford Foundation for Public Giving, the State of Connecticut, the Natural Resource Conservation Service (NRCS) of the USDA and the Town of Simsbury. This sort

of cooperative project might be considered in the future in other towns to keep local farms in business. (For a comparison of the effects of fee-simple purchase and purchase of development rights, see pp. 28-29 in *Planning For Agriculture: A Guide for Connecticut Municipalities*).

Geological Resources Management Priorities

The Wild and Scenic Study Committee has identified four priorities for managing geological resources in the ten towns of the study area:

1. Protecting significant and diverse geological features.
2. Protecting drinking water aquifers.
3. Protecting agricultural soils and local farms.
4. Planning for a changing, dynamic river.

Actions, Tools & Strategies

1. *Protecting Significant and Diverse Geological Features*

Undertaking a professional inventory of important geological sites in each town and prioritizing their conservation value would be a first step in protecting significant geological resources that are not already protected. Towns could review such an inventory, which could potentially be funded through the National Park Service, and integrate it as they find appropriate into their open space planning. Such an inventory should also be shared with land trusts and other conservation organizations to enable the development of partnerships among the organizations and municipalities to accomplish the most important mutually-beneficial goals.

In some towns, regulatory changes might provide protection for certain geological features. For example, with regard to development on steep slopes, some towns have no regulatory protection or the regulations are not particularly strong, yet the state's enabling legislation allows strong regulation. Developing and enacting effective regulations would help protect water quality and public safety.

2. *Protecting Drinking Water Aquifers*

Seventy-eight Connecticut towns have well fields in aquifers that serve more than 1000 people. The CT DEP has mapped these aquifers in what it calls "Level B" mapping and requires the water utilities that pump



Farmington Land Trust parcel
Photo: Charles Leach

from the aquifers to complete and provide more accurate aquifer maps. These refined maps, produced through “Level A” mapping standards set by the DEP, must be approved by the DEP. The final maps define the boundaries of the Aquifer Protection Areas (APAs). Towns with APAs must designate an Aquifer Protection Agency. The towns must inventory land use in these areas and adopt and implement land use regulations in accordance with State of Connecticut statutes in order to protect the aquifers from contamination. “The regulations restrict development of certain new land use activities that use, store, handle or dispose of hazardous materials and require existing regulated land uses to register and follow best management practices.” (http://www.ct.gov/dep/cwp/view.asp?a=2685&q=322252&depNav_GID=1654).

Of the ten towns in the Wild and Scenic Study area, Avon, Burlington, Canton, Farmington and Simsbury have APAs (see Figure 16: Aquifer Protection Areas). These towns are in different stages of the aquifer protection process prescribed by the state, and should move forward with developing appropriate land use regulations when the necessary mapping has been approved by the state.

3. Protecting Agricultural Soils and Local Farms

A burgeoning interest in locally grown food, with its advantages of freshness,

better flavor and higher nutritional value, as well as savings in transportation costs and enhanced economic multiplier benefits to local communities has led more communities to look at their farms as valuable assets. The social climate is favorable to farmland protection, and thus protection of good agricultural soils. The American Farmland Trust and the Connecticut Conference of Municipalities, with funding from the Hartford Foundation for Public Giving and the Connecticut Department of Agriculture, have put together an excellent guide on how to keep farming viable in Connecticut. It is available online at www.ctplanningforagriculture.com. This volume provides information for towns, organizations and citizens about the economic, fiscal, cultural, environmental and recreational values of Connecticut farms, gives advice on town planning and regulatory possibilities for farm protection and lists of sources of assistance and funding. Agriculture is a category within both the geology and cultural landscape ORV sections. It is envisioned that the committee will try to partner with towns, organizations such as the Connecticut Farmland Trust and farmers to support the protection of important agricultural soils, open space and food production. A link is provided to this important document because it is a resource

Some key findings on the status of Water Quality in the lower Farmington River and Salmon Brook:

- Salmon Brook is considered to exhibit among the highest water quality of any river in Connecticut.
- Due to the excellent water quality of Salmon Brook it is one of the premier cold-water fisheries of the state and is a top priority targeted stream for salmon restoration. Outstanding recreational opportunities such as boating and fishing in the streams relate directly to the presence of high water quality. The excellent water quality in Salmon Brook provides for swimming opportunities.
- Aquatic insect studies for the Salmon Brook indicate that conditions within the watershed are among the very best in Connecticut. For example, stoneflies, indicative of high water quality, are found throughout the Salmon Brook basin. Overall, both the Farmington and Salmon Brook macroinvertebrate communities are outstanding.
- Variety and abundance of freshwater mussel species and fish as indicators of high water quality.

for the state-of-the-art tools and strategies available for farmland protection that are too varied to detail here.

4. *Planning for a Changing, Dynamic River*

The landscape of the Farmington Valley is sculpted by the dynamic behavior of rivers and streams. The natural meandering, erosion, and deposition that is characteristic of rivers has become better known over time and is the subject of ongoing study by fluvial geomorphologists. Past development, conducted with a less complete knowledge of river dynamics, has produced some situations where streambank stabilization and flood control measures such as armoring banks or channelizing riverbeds has produced other problems (for example, exacerbated downstream erosion) that tend to recur and cause ongoing expense. In developing long-term plans of conservation and development, it is important to incorporate the principles and best practices recommended by fluvial geomorphologists so that towns accommodate the behavior of rivers and streams in a way that incorporates safety, ecological function, sustainability, and long-term (as opposed to short-term) cost-effectiveness for the whole community.

Consideration of river dynamics is especially important as we face the challenges of climate change. Increases in precipitation and flood flows in Connecticut rivers over the past century have been documented; these

inevitably affect river dynamics and the size of stream channels. River corridor planning should include measures for adapting to the changes that can reasonably be expected for increased flow volumes, channel size, channel changes, wider fluctuations between high and low water, and other predictions emerging from the study of climate change in southern New England.

Outstanding Resource Value: Water Quality

Overview

The very high water quality of the lower Farmington River compared to other rivers its size in Connecticut, and the excellent water quality of Salmon Brook, are defining characteristics of these watercourses. The headwaters of both are in largely undeveloped, wooded landscapes. Trees on stream banks provide shade, keeping water temperatures low, and vegetated buffers protect rivers from nonpoint source pollution. The exceptional water quality in the upper Farmington River and in Salmon Brook contributes substantially to the quality of water in the lower Farmington, which supports a diversity of species and habitats, and provides many recreational opportunities including boating, swimming and fishing. The upper Farmington River Watershed (East Branch) provides drinking water to over 600,000 people in greater Hartford and stratified drift aquifers, adjacent to the lower



FRWA water quality education program

Drunella, an indicator of excellent water quality



Farmington River, provides drinking water through major water supply wells.

See Figure 17: Major Tributaries.

Water Quality Monitoring Programs

Water quality monitoring of the lower Farmington River and Salmon Brook is conducted by the CT DEP, USGS, US EPA, Farmington River Watershed Association (FRWA), Salmon Brook Watershed Association (SBWA) and the Farmington Valley Health District, as well as local schools that participate through Project SEARCH, collaboration between the CT DEP and Children's Museum of Hartford. These programs provide baseline data for describing and tracking the health of these watercourses through chemical, physical and biological indicators. The effective water resource protection and enhancement of the lower Farmington River and Salmon Brook is based on the existence of high quality baseline data that is provided through the groups listed above. See Appendix 2: Water Quality for a more detailed description of the current monitoring programs employed by the DEP and the FRWA.

Indicators of Water Quality

Chemical data: For the lower Farmington, chemical data meet state water quality standards, and most of Salmon Brook is consistently better than the standards (refer to the letter from Mike Beauchene of the CT DEP in Appendix 2).

Bacteria levels: Most of the Study Area meets state standards for bacteria levels. A 13.5 mile segment of the mainstem/East Branch of Salmon Brook and a 1.4 mile segment of the West Branch Salmon Brook are on the CT 2008 Impaired Waters List because levels of bacteria exceed state standards. The bacteria source is unknown, but could be related to agricultural land uses. The mainstem and

East Branch Salmon Brook are likely to require the development of a Total Maximum Daily Load (TMDL) analysis in the future, that will provide a framework for restoring the impairments. TMDL is a calculation of the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards. See Figure 18: State Water Quality Classifications.

Other biological indicators: While chemical and physical tests of water samples taken on a given day show water quality at that moment in time, the composition of species living in a river or stream year round reflects long-term water quality. One of the most useful of these biological indicators is the community of bottom dwelling aquatic organisms known as benthic macroinvertebrates, including insect larvae, crustaceans, worms and other life forms. Some of these are highly sensitive to water pollution and habitat change, so that even subtle or intermittent pollution alters the number or proportions of species present. Thus, monitoring the composition of benthic macroinvertebrate species provides information about a stream's water quality over extended periods.

Macroinvertebrate monitoring protocols require that samples be collected from riffle habitats. Salmon Brook has abundant riffle habitat, and almost every site sampled shows exceptionally good macroinvertebrate communities. For example, stoneflies, indicative of high water quality, are found throughout the Salmon Brook basin. Overall, both the Farmington and Salmon Brook macroinvertebrate communities are outstanding.

Another indicator of good water quality is the variety and abundance of freshwater mussel species. The Study Area supports unsurpassed freshwater mussel diversity. Of the 12 mussel species found in southern New England, all have populations in the Farmington River, a total as yet undocumented for any other river in the region. Mussels are sensitive to environmental degradation and mussel populations are under great threat globally, so the presence of all 12 mussel species here is particularly significant. As well as indicating high water quality, mussels also maintain it with their filtering capabilities. Freshwater mussel expert Ethan Nedeau points out that "Collectively, mussels can filter an enormous volume of water each year and may help

Salmon Brook is one of the last true cold water fisheries in the State of Connecticut, supporting thriving, breeding native populations of brook and brown trout.

reduce turbidity in some waterbodies” (Nadeau, 2008). For more information about mussel populations in the lower Farmington River, see the Biodiversity Section.

The array of fish species in the Farmington River and Salmon Brook is yet another measure of water quality. From below the confluence of Salmon Brook to the Farmington River’s mouth at the Connecticut River; there is particularly diverse fish life. Salmon Brook contains some of the best possible habitat for juvenile salmon as well as a wide variety of other fish species. The influx of clear cold water from Salmon Brook provides a refuge for temperature sensitive fish, particularly in summer months. Salmon Brook is one of the last true cold water fisheries in the State of Connecticut, supporting thriving, breeding native populations of brook and brown trout. The presence of the slimy sculpin, which requires consistently cold water temperatures, is strongly indicative of excellent water quality. See the Recreation Section for more details on angling in the Salmon Brook.

Overall, the water quality of the lower Farmington River and Salmon Brook is recognized as an outstanding resource value based on:

- The importance of clean water to overall public health.
- The diverse natural communities it supports.
- The enormous recreational resource it provides.
- The drinking water it supplies to Connecticut.

Its continued value depends in large part on sound management of the river corridor.

Water Quality Protection Goal

Identify, understand, maintain, and as needed improve the chemical, physical, biological, and flow conditions in the waters of the lower Farmington River and Salmon Brook so that they support the needs of native wildlife, aquatic life, and recreational users.

Threats to Water Quality

Non-point source pollution. Non-point source pollution is the greatest threat to water quality in the study area and contributing watersheds. As water flows over land it collects pollutants such as fertilizer, pesticides,

sediments and bacteria and discharges them to waterbodies and streams. More intensively used land has the potential to create more polluted runoff. However, all types of land uses including commercial, industrial, residential and agricultural properties can contribute to the problem. Loss of vegetated buffers along streams allows runoff to enter streams without the benefit of filtration. An increase in impervious surfaces within the watershed compounds the problem by allowing water to race over heated, impenetrable surfaces, picking up pollutants along the way. (In this context, storm drain outfalls can be considered “non-point source.” Though they have specific discharge points, they collect runoff that may contain multiple pollutants from multiple sources.)

New threats to water quality are usually non-point sources related to: new development that increases impervious surfaces; installation of poor stormwater management systems; destruction of riparian vegetation that buffer river edges; additional lawns that supply polluted runoff from fertilizer and pesticide applications; stream channel alterations or new stream crossings; poor or absent control of erosion and sedimentation; and failed or poorly maintained catch basins. Also, the altering or filling of streams, wetlands and vernal pools, especially in headwater areas, is identified as a major threat.

Point sources. There are six point source discharges along the lower Farmington River and four along the Pequabuck River, a tributary that can degrade water quality in the Farmington. All of these are wastewater treatment plants. There is increasing interest and concern related to the presence of endocrine disrupting chemicals, pharmaceuticals and household products in the waste stream, though there is currently not equipped to treat wastewater for these compounds (however, it is important to note that for the most part the introduction of wastewater treatment plants in the 1960s has resulted in dramatically improved water quality conditions).

Current Protections

To understand existing protections and identify desirable additional protections, a review of applicable regulations within the study area was undertaken. Results are summarized here; the full regulation *Review* is located in the Appendix.

As water flows over land it collects pollutants such as fertilizer, pesticides, sediments and bacteria and discharges them to waterbodies and streams.

Federal and state protections.

Surface water discharges are regulated under the Clean Water Act. The CT DEP issues the discharge permits through the National Pollutant Discharge Elimination System (NPDES).

The Environmental Protection Agency (US EPA) has mandated a number of permit programs, administered by the Department of Environmental Protection (US DEP), to manage stormwater pollution, including the following:

1. The [Stormwater Associated with Construction Activities General Permit](#) requires industrial facilities to cover or remove materials whose exposure to precipitation could produce polluted stormwater.
2. The [Stormwater Associated with Construction Activities General Permit](#) requires developers and builders to implement stormwater management plans that will prevent the movement of soil and sediments off construction sites and into nearby streams and water bodies.
3. The [Stormwater Associated with Commercial Activities General Permit](#), found only in Connecticut, requires operators of large paved commercial sites such as malls, movie theaters, and supermarkets to undertake actions such as parking lot sweeping and catch basin cleaning to keep stormwater clean before it reaches water bodies.
4. The [Stormwater from Small Municipal Separate Storm Sewer Systems General Permit](#) requires each municipality to take steps to keep the stormwater entering its storm sewer systems clean before entering water bodies. One important element of this permit is the requirement that towns implement public education programs to make residents aware that stormwater pollutants emanate from many of their everyday living activities, and to inform them of steps they can take to reduce pollutants in stormwater runoff.

(Source: http://www.ct.gov/dep/cwp/view.asp?a=2721&q=325702&depNav_GID=1654)

In addition, the Clean Water Act Section 404 program, implemented by the Army Corps of Engineers, regulates the discharge of dredged or fill material in the waters of the U.S.

The Wild and Scenic Rivers Act provides no specific guidance on water quality for recreational rivers. However, the Clean Water Act has made it a national goal that all waters of the U.S. be fishable and swimmable, and provides the legal means for upgrading water quality in any river which would otherwise be suitable for inclusion in the system. Consistent with the Clean Water Act, water quality in recreational river areas will be maintained or, where necessary, improved to levels which meet Federal criteria or federally approved State standards for aesthetics and fish and wildlife propagation. River managers will work with local authorities to abate activities within the river area which are degrading or would degrade existing water quality.

Local protections. Some of the key existing protections for water quality at the local level include regulations that protect wetlands, watercourses, vernal pools, floodplains, aquifers, riparian buffers and existing vegetation.

- All ten towns have inland wetland upland review area regulations that provide oversight regarding activities within riparian corridors; however only some towns regulate activities that affect riparian corridor functions. The vernal pool definition is included within the wetland and watercourse definition for the majority of towns thus adding strength of protection for these special wetlands.
- Town regulations show widespread recognition of the importance of maintaining vegetated buffers along wetlands and watercourses. Techniques employed include retention of natural vegetation and preservation of trees of certain size and condition, establishment of riparian buffers, provisions for planting and best management plans. In Hartland and Canton, where part of the Farmington is already designated Wild and Scenic, the Farmington River Overlay District associated with the designation also helps protect riverside vegetation. In some towns there are still opportunities to protect water quality and prevent erosion through requirements for vegetative buffers near wetlands and watercourses, restricted use of invasive plants in site plans and subdivisions, or retention of existing vegetation for proposed development sites.

Study Area communities have already taken many measures to protect watershed health.

- Most towns have some level of floodplain protection, but need to take greater advantage of the state enabling legislation. Floodplain zoning regulations should also be revised to make them consistent with the latest FEMA requirements.
- Five of the ten towns have identified and/or mapped aquifer protection areas through the State Aquifer Protection Area Program. The responsibility for this program is shared with the State, municipalities and water companies (see Figure 16: Aquifer Protection Areas).
- At the town level, water quality protection through stormwater regulations is extremely varied. Depending on the town, the regulations may include:
 - Landscape plans that provide for groundwater recharge areas and buffers.
 - Discharge of stormwater within the upland review area.
 - Designing drainage systems based on maximum development of entire watershed.
 - Innovative stormwater management designs with respect to impervious coverage limits (see Figure 19: Local Basin Percent Impervious).
- Riparian corridor protection.
- Stormwater design and management.
- Watercourse crossing design.
- Stormwater management associated with local and state roadways.
- Stormwater management for nonpoint source pollution.
- Septic system maintenance.
- Agricultural practices that are exempt from review or oversight by local commissions.
- Public education regarding nonpoint source pollution for landowners.
- Endocrine disrupting chemicals, pharmaceuticals and household products untreated in waste stream.

Specific recommendations for addressing these are found in the full *Review* appended to this Management Plan.

Water Quality Management Priorities

The Study Committee recognizes that it is essential to track the status of water quality in the watershed, understand factors that impact it, and take actions that best address or prevent both point source and non-point source pollution. To meet these needs, the following management priorities were set:

1. Identify and understand the chemical, physical and biological indicators of water quality, and the flow conditions, in the river/stream corridor and contributing watershed.
2. Reduce and prevent non-point source pollution.
3. Address ongoing and emerging issues in point source pollution.
4. Protect the riparian corridor.
5. Support prioritized open space protection.

These management priorities, especially the first three, can be used to lay the groundwork for future development of an EPA- and DEP-approved Watershed Based Plan for the lower Farmington and Salmon Brook. An approved Watershed Based Plan (distinct from this Wild and Scenic Management Plan) could qualify any impaired sections of these watercourses for funding through Section 319 of the Clean Water Act to implement projects that address water quality impairments. The approved plan must incorporate nine elements:

Overall, regulatory measures vary across the ten towns, and there are opportunities for towns to strengthen water quality protection by more complete use of the state's existing enabling legislation. In addition to specific suggestions above, the State of Connecticut provides guidance on water quality protection through the 1.) Stormwater Quality Manual and the 2.) Soil Erosion and Sediment Control Manual. It is recommended that each town update their regulations to reflect the most recent versions of these guidelines as not all have done so.

Gaps in Water Quality Protection

Study Area communities have already taken many measures to protect watershed health. Some foreseeable threats are adequately addressed through these mechanisms, while others are not. The first step in addressing protection gaps (as noted above) is to fully use existing regulatory mechanisms. Beyond that, additional measures could be considered; a comparison of known threats to water quality with existing protection measures reveals gaps in protection associated with:

- Identification of pollutant causes and sources.
- Pollutant load reduction estimates.
- Potential implementation sites for best management practices.
- Estimates of financial and technical assistance needed, and entities needed, to implement the plan.
- An education and outreach component, with demonstration projects, that encourages public participation.
- A plan implementation schedule.
- A list of interim milestones.
- Criteria for determining whether pollutant loads are being reduced over time.
- Monitoring that evaluates effectiveness of implementation measures over time.

Since many of the actions and techniques listed below can fulfill these requirements, it is recommended that FSWS incorporate development of a Watershed Based Plan into its overall workplan for water quality management.

Actions, Tool & Strategies

Priority 1: Identify and understand the flow conditions and the chemical, physical and biological indicators of water quality in the river/stream corridor and contributing watershed.

- Continue and expand water quality monitoring programs. Expanded monitoring would increase the ability to assess water quality conditions and trends over time (see Appendix 2: Water Quality for a description of existing programs). Techniques should include up-to-date protocols for monitoring benthic macroinvertebrates, coliform bacteria, nutrients, temperature, or where warranted, specific chemical or pharmaceutical contaminants.
- Identify water quality parameters and flow regimes that support the needs of native flora and fauna, in order to protect, maintain, or restore stream segments as needed. Techniques may include studying populations of indicator species over time.
- Identify water quality parameters and flow regimes that support the needs of recreational users.
- Document stream segments with high water quality in order to protect them from future degradation.
- Identify impaired stream segments in order to locate and mitigate sources of pollution.
- Identify, locate, and quantify non-point source pollution from agricultural land and other land uses. Techniques can include direct methods such as water quality monitoring or indirect methods such as land use mapping coupled with data about typical pollutant loads from specific land uses.
- Collect flow data from the Town of Windsor river segment by reestablishing a USGS flow gage; maintain existing USGS flow gages in the corridor; collect additional flow data as appropriate.
- Develop an EPA-approved Watershed Based Plan.

Priority 2. Reduce and prevent non-point source pollution.

- Use the DEP's reference manuals and guidelines to strengthen each town's ability to regulate non-point source pollution--for example, the most current versions of the "Stormwater Quality Manual", and the "Guidelines for Soil Erosion and Sediment Control."
- Adopt local aquifer protection regulations. In towns where no aquifers fall under state aquifer protection requirements as public water supply sources, many residents get drinking water from groundwater sources via individual wells. It is vital to protect all aquifers important to public health, as well as ensure that groundwater entering the river via baseflow is not contaminated.
- Incorporate provisions for regulating the storage and release of pollutants, such as pesticides and fertilizer, into existing regulations where appropriate (e.g., floodplain ordinances).
- Incorporate LID techniques into town regulations by: 1.) regulating the total amount of lot coverage to reduce impervious surfaces as part of development approval; for example, through smaller building footprints, reduced road widths or porous pavement and 2.) authorizing applicants to propose alternative/innovative stormwater management systems, such as bioretention basins, infiltration devices, pervious paving materials, grassed swales, curbless roads and use of natural drainage patterns.

- Maintain or restore predevelopment hydrology in order to protect groundwater recharge capability. Appropriate techniques include limiting impervious surfaces, the use of swales and other Low Impact Development (LID) measures and best management practices (BMPs) that assist infiltration.
- Decrease the volume of stormwater runoff, again using techniques of Low Impact Development and Best Management Practices for reducing and slowing surface runoff and removing pollutants such as sediments, nutrients and heavy metals (see Appendix 2: Water Quality for detailed LID management strategy recommendations).
- Promote local public works and state road construction and maintenance standards that reduce and eliminate (when possible) use of road salt/sand, lawn care pesticides and fertilizers.
- Implement landowner education and outreach initiatives to promote water quality-friendly lawns/landscaping to eliminate lawn care pesticide use, reduce use of fertilizers, encourage use of zero percent phosphorus fertilizers and reduction of lawn watering and mowing. Provide guidance for use of native/non-invasive vegetation for landscaping.
- Promote best management practices for agricultural land uses, from an agency such as the U.S. Dept. of Agriculture's Natural Resource Conservation Service, to prevent non-point source pollution.
- Establish or update regulations to the extent allowed by state statute to minimize non-point source pollution associated with timber management activities.
- Establish septic system maintenance regulations consistent with the requirements of state statute.
- Support incorporation of new EPA turbidity discharge levels from construction sites into Inland Wetlands regulations; also support the application of direct-discharge turbidity standards to stormwater catch basin outlets.

Autumn rain at East Granby Land Trust parcel Photo: Ian Clark



Riparian corridors, those lands adjacent to rivers and streams, are the first line of defense for a river system.

- Support and promote household hazardous waste collection to minimize potential sources of non-point source pollution.

Priority 3. Address ongoing and emerging issues in point source pollution.

- Provide input to the DEP regarding permits that regulate point discharges and add pollutant load to the streams through wastewater or industrial point source discharges.
- Identify and report illicit discharges to the DEP.
- Provide education regarding the impacts to water quality, aquatic life and human health from the presence of toxins, pharmaceuticals and personal care waste products in our streams, groundwater and drinking water. Also, provide information on ways to reduce and recycle these substances.
- Support efforts to educate businesses, local officials and the general public regarding the proper disposal of hazardous waste, pharmaceuticals, and household products.

Priority 4. Protect the riparian corridor.

Riparian corridors, those lands adjacent to rivers and streams, are the first line of defense for a river system. Maintaining the natural condition of these areas is necessary to ensure the long-term health of river systems. Streamside vegetation (a.k.a. a riparian buffer) maintains stream bank stability, prevents soil erosion and sedimentation, slows down runoff, and filters pollutants from stormwater run-off. The protection and establishment of riparian buffers throughout the corridor can be promoted through the following measures and techniques.

- Use the DEP's reference manuals and guidelines to the greatest extent possible to strengthen each town's ability to regulate riparian buffers.
- Take full advantage of the State of Connecticut's General Statutes enabling legislation that requires towns to adopt wetland regulations and to regulate impacts on wetlands and watercourses beyond the wetland boundary by using Upland Review Areas (URAs). For example, vernal pools typically merit greater protection and so the regulation

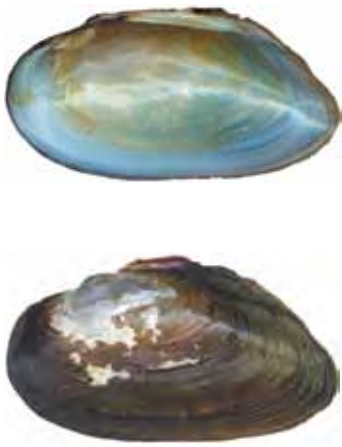
can provide for a larger URA. URAs can be as large as necessary to protect the wetland function from detrimental impacts.

- Require buffers adjacent to wetlands and watercourses, encourage use of native/non-invasive plant species in site plans and subdivisions and require preservation of existing native vegetation on proposed development sites. Sponsor buffer and rain garden planting projects to correct existing problems along watercourses and as a means to educate the public regarding the benefits.
- Establish or improve town landscaping requirements to protect riparian buffers.
- Incorporate riparian areas as a priority in open space planning and acquisition activities, as well as in defining open space set asides in new subdivision applications.
- Implement landowner education and outreach initiatives on the importance of riparian areas.
- Meet current standards when repairing or replacing existing watercourse crossings.
- Avoid new watercourse crossings to the maximum extent feasible. Where not feasible minimize (e.g. reduce number of watercourse crossings, preferably crossing at narrowest location with a minimum amount of fill or disturbance) or mitigate (e.g. install a clear span over a watercourse instead of a closed culvert) new watercourse crossings.
- Implement municipal and state road construction and maintenance standards that protect riparian area function.

Priority 5. Support prioritized open space protection.

Identify and rank critical areas for protection, based on their value in conserving river health and ORVs; undertake the necessary open space planning; and support protection techniques such as fee in lieu of open space for developers. Recommended actions include:

- Giving high protection priority to headwaters and tributaries of Salmon Brook.
- Giving high protection priority to riparian buffers.
- Allowing cluster and density bonus development that sets aside open space and promotes outstanding resource protection.



Dwarf Wedgemussel
Photo: Ethan Nadeau

Some key findings on the status of Biological Diversity in the lower Farmington and Salmon Brook:

- The river itself is the only one known to support all 12 of the freshwater mussel species native to southern New England. The Farmington River may contain one of the New England's most—and Connecticut's only—viable dwarf wedgemussel populations, which is the only federally endangered freshwater mussel that occurs in New England.
- There are 19 state-listed plant species within the corridor including the only known population of Dwarf bulrush in a river ecosystem, only known population of Purple giant hyssop in Connecticut and the corridor's floodplain forest also supports nearly the entire population of starry campion in New England.
- At least 25 species of finfish are present in Salmon Brook and 30 species in the lower Farmington River. The Salmon Brook supports an exceptional recreational fishery starring native brown and brook trout. Migratory fish such as American shad, blueback herring, alewife, American eel and Atlantic salmon have excellent spawning habitat in the lower Farmington corridor.
- Salmon Brook exhibits basin-wide distribution of high-quality fish communities which is rare in Connecticut.
- The mouth of the Farmington River where it meets the Connecticut River is the most diverse and one of the most important areas within New England in terms of fish resources. All 12 of the diadromous fish species thought to be present in the state are believed to be present at this location.

- Requiring connectivity for open space, especially along the linear habitat of river and stream corridors.
- Disallowing steep slopes and wetlands in open space requirement calculations.
- Purchasing development rights on agricultural land, especially near the watercourses of the corridor.
- Pursuing conservation easements if adequate oversight, maintenance and enforcement can be ensured.

Outstanding Resource Value: Biological Diversity

Overview

Biological diversity in the study corridor can be evaluated at more than one level. It can be measured by sheer number of species, and also by the number of species assemblages (biological communities) present. These in turn occur within "ecoregions," areas with a distinctive ecology and physical landscape. To include all levels of diversity, the descriptions in this section are grouped by ecoregion, within which significant communities and species are noted. The picture that emerges

is a corridor that is diverse at all levels, with many species and communities that warrant special recognition.

Biodiversity is closely linked to land uses as well as landscape type. Land use within the river corridor is similar to that in the watershed as a whole: large tracts of forest and extensive ridge and wetland systems combine with a mix of urban centers, suburban residential and commercial development, light industry, and agriculture. However, the relative proportions of land uses within the corridor itself (in 2000, 52% urban areas, 48% non-urban), along with other factors, leave the corridor vulnerable to a decline in biodiversity unless action is taken to manage and protect its living resources. See Figure 27: Land Cover Changes from 1985 to 2006.

The corridor's landscape ranges from low, flat wetland to steep upland. This varied terrain supports a diverse array of plants, including 19 state-listed species (see Figure 24: Endangered, Threatened or Special Concern Species and Appendix 3: Biological Diversity—Table 1). The river and its banks also provide a critical dispersal and migratory route for both terrestrial and aquatic wildlife. The thriving

Wood frog egg mass
Photo: Alisa Phillips-Griggs



The river is notable for its variety of native freshwater mussels, including the dwarf wedgemussel, the only federally endangered freshwater mussel that occurs in Connecticut.

mammalian community includes bear, fisher, otter, bobcat, coyote, deer, and occasional moose. A migratory bird survey conducted along the Farmington in spring 2009 alone yielded a significantly high species diversity (Shannon-Weiner Index of 3.0), totaling 2124 individuals of 105 species, including all state and federally listed raptors as well as a number of other federally listed wading and perching birds (see Appendix 3: Biological Diversity — Table 2 and Figure 26: Study Bird Observation Locations & Known Focal Bird Species). Notable sightings included bald eagle, osprey, American kestrel, northern harrier, American bittern, snowy egret, and great egret. In addition the river supports a great blue heron rookery. The river is notable for its variety of native freshwater mussels, including the dwarf wedgemussel, the only federally endangered freshwater mussel that occurs in Connecticut. This mussel is found in no other Connecticut River, and the Farmington may have one of New England's most viable populations. At least 35 species of finfish are also present in the corridor, supporting an exceptional recreational fishery starring native brook trout and self-sustaining introduced brown trout. Migratory fish such as American shad, blueback herring, alewife, American eel, and Atlantic salmon have excellent spawning habitat in the corridor, which could support substantial increases in their populations.

The Corridor's Ecoregions

The watershed as a whole comprises ten ecoregions or areas with distinctive ecological and physical features (see Figure 20: Ecoregions).¹ Within the corridor, seven ecoregions are so distinctive or extensive that they contribute significantly to the corridor's biodiversity. These are described below, along with descriptions of aquatic biodiversity in Salmon Brook and the Farmington River. For each ecoregion, significant biological communities and species are also noted.

Traprock Ridge (2% of study corridor land)

The traprock ridges of the lower Farmington Valley formed from the tilting of rock layers through faulting and earthquake activity. The upper edges of these tilted layers form the north-south ridges that figure prominently in the valley's topography. The most dramatic section of traprock ridge in the corridor is along the East Granby/Bloomfield boundary. There, the river has cut a ravine through the ridge known as Tariffville Gorge.

Where the river skirts the base of the ridge, the study corridor has *steep slopes, moist ravines, and mineral-rich ledges of basalt talus*. These spots have distinctive microclimates that support plant and animal communities uncommon in Connecticut. Spiked false oats, once thought to be extirpated, is one of the notable species found along the traprock ridge, as well as Virginia copperleaf and blue-spotted salamander.

¹ The Farmington Valley Biodiversity Project (FVBP), on which this summary is partly based and is referenced in the rear of this report, contains fewer than ten ecoregions for the corridor. The additional ecoregions were delineated after publication of the FVBP.



Great Blue Heron Photo: Tom Cameron

*Highland and Highland Transition
(3% and 5% of corridor)*

In Granby and Hartland, the upper east and west branches of Salmon Brook traverse two ecoregions known as Highland and Highland Transition. Compared to the lower Farmington reaches, they generally have higher elevations, steeper slopes and more dramatic stream gradients. About 13.4% of the whole Farmington and Salmon Brook corridor consists of “core forest,” and much of this is in the Salmon Brook headwater region. Here, large tracts of contiguous forests of northern hardwood and conifers support robust communities of *forest interior* birds including the state-listed Cerulean Warbler (see Appendix 3: Table 1). Black bear, fisher, bobcat, otter and an occasional moose are also characteristic of this area.

Sand Plain (5% of corridor land)

Sand plain is usually a flat-topped topographical feature composed of sand fill, originally formed as a delta by water running out of a glacier. Historically, the diversity value of sand plains has often been overlooked. They are the least common habitat in the study area because they are subject to development, excavation or reversion to forest if unmanaged. Sand plains support unique *sand plain grassland communities*, including populations of the federally listed Savannah Sparrow and the Pine Barrens Tiger Beetle, whose habitats are at a premium and in need of protection, as well as the State-listed species Low Frostweed. Other sand plain communities in the corridor include pitch-pine/scrub oak shrublands or woodlands, and juniper/white pine woodlands.

Small pockets of sand plain are found throughout the low lying central river valley, and are subject to development pressure. Several are in Simsbury; some are also in Farmington along the rail trail in the Brickyard Road area. A relatively dense concentration of sand plains is also found along the Farmington mainstem east of its confluence with Salmon Brook (see Figure 20: Ecoregions).

Glacial Lake Plain (14% of corridor land)

As the name implies, the glacial lake plain ecoregion is underlain by the fine silts laid down at the bottom of the glacial lake that once filled the lower Farmington Valley. The silts are fairly impermeable, conducive to the formation of extensive *red maple swamps* and many *vernal pools*. By providing the critical breeding habitat for a diversity of frogs and salamanders, vernal pools support an important component of the valley’s biological community (see Figure 21: Critical Habitats and Potential Vernal Pools). The silt of glacial lake plains is fertile, and thus allowed for the extensive development of agriculture in the lower valley. The resulting large cleared areas now support outstanding *grassland communities*. Their resident birds include the Bobolink and the Eastern Meadowlark (see Appendix 3: Table 1), two members of a suite of grassland species that are generally in decline statewide.

Glacio-Fluvial Plain (21% of corridor land)

The underlying substrate of this ecoregion was first moved by glaciers, then sorted and deposited by streams flowing from the melting

According to CT DEP scientists, there are exceptional coldwater fish communities at almost every site sampled in the Salmon Brook...

ice. The deposits are therefore layered, and take various forms such as outwash plains, valley trains, deltas, kames, eskers and kame terraces. The topography is less flat than alluvial plain, and the sediments coarser and well drained. These areas frequently provide an “ecotone” (a transition region) with abundant shrubs and small trees, which typically supports a rich diversity of bird species and foraging mammals. In the corridor, these areas tend to have the highest concentration of development.

Alluvial Plain/Alluvial Floodplain (32% of corridor land)

Alluvial plain is a relatively flat landform created by the deposit of sediments over a long period by watercourses. The “plain” is the larger area over which the floodplains have shifted over geological time. The “floodplain” is the active area of that process, where the river has been flooding over the course of recent decades or centuries.

This ecoregion covers the largest percentage of corridor land and supports important natural communities such as *marshes, wet meadows, floodplain forests, sand bars and mud flats, forest levees and vernal pools*. River otters, once absent from these areas, have now been documented as returning residents. These areas also include breeding populations of mergansers, wood ducks, herons, kestrels, harriers and eagles. Wetlands and wet grasslands associated with the floodplain are second only to dense forest in removing carbon from the atmosphere. They also function as water storage and flood mitigation sites. Thus they provide the benefits that are sometimes called “ecosystem services.”

Alluvial Floodplain Communities

Marshes are wetlands subject to frequent or continuous inundation, and are dominated by grasses, rushes, reeds, cattails, sedges and other herbaceous plants. Disturbed marshes often have low-growing shrubs and even small trees in a context of shallow water (*scrub and shrub marsh*). They have an extremely high rate of production of plant matter, effectively harvesting excess nutrients from runoff and preventing those nutrients from entering the river (where they would be in effect pollutants). They act as ground water recharge sites and provide for floodwater storage reducing the severity of flood events. Marshes and wet meadows are second only to rain forests

in providing sites to fix carbon from the atmosphere and substantially contribute to mitigating global warming.

Marshes are critically important for wildlife, serving as breeding grounds and nurseries for a wide variety of aquatic and terrestrial life, including great blue heron, little green heron and American bittern. Along with marshes, the corridor also includes *shade swamps* that feature trees and shrubs, with notable examples in Farmington, Simsbury and East Granby.

Wet meadows are semi-wetland grasslands which are saturated throughout much of the year, because of poor drainage and/or frequent flooding from the river. Unlike a marsh or swamp, a wet meadow does not have standing water except for brief to moderate periods during the growing season. Instead, the ground is typically damp, like a well-soaked-sponge. Vegetation includes a wide variety of herbaceous species including sedges, rushes, forbs and grasses. Wet meadows support the largest reported New England population of state-listed Davis Sedge (See Appendix 3: Table 1). Wet meadows can be found along the corridor in Farmington, Avon and Simsbury.

In areas where the current slows, the sand suspended in the water settles out and forms *sand bars*. As the current slows even further, the lighter and finer silts drop out and form *mud flats*. Both are important habitats for interstitial fauna (small invertebrate animals that live between the particles). Because of their abundant invertebrates, these flats are important feeding areas for nesting and migratory birds such as spotted sandpiper, the state-listed Virginia rail, upland sandpiper and a variety of other wading birds and waterfowl. The finer sediments on the river bottom also provide habitat for mussels.

Sediment deposited on riverbanks during flood events can form *levees*, which gradually recruit *floodplain forest* species such as silver maple, white ash, green ash, black willow and poplar. Because they have few woody shrubs, floodplain forests can have a dense understory of rapidly-growing herbaceous plants. An unusual aspect of the floodplain forest is the many vines which festoon the trees. The river’s floodplain/levee forests are an especially rich source of state-listed plant species. Recent discoveries included New England grape, Davis sedge, Virginia waterleaf, the only

CT DEP Natural Diversity Database Species Observed Within the Study Corridor

A Horse Fly	Eastern Hognose Snake	Panic Grass
American Ginseng	Eastern Meadowlark	Pine Barrens Tiger Beetle
A Noctuid Moth	Eastern Pearlshell	Purple Giant Hyssop
Bald Eagle	Eastern Pondmussel	Rapids Clubtail
Basil Mountain-mint	Eyed Brown	Sedge
Blue-spotted Salamander	Frosted Elf	Spiked False Oats
Bobolink	Grasshopper Sparrow	Starry Campion
Bog Rosemary	Great St. John's-wort	Threadfoot
Cursed Crowfoot	Hare's Tail	Tidewater Mucket
Davis' Sedge	Jefferson Salamander	Virginia Copperleaf
Dillen Tick-trefoil	Longleaf Bluet	Virginia Waterleaf
Dwarf Bulrush	Low Frostweed	Whip-poor-will
Dwarf Wedgemussel	New England Grape	White Mandarin
Eastern Box Turtle	Northern Harrier	Wiegand's Wild Rice
	Northern Leopard Frog	

CT DEP Natural Diversity Database Species Associated with the Traprock Ridges

American Ginseng	Five-lined Skink	Sedge
Atlantis Fritillary	Goldie's Fern	Slender Wheatgrass
Basil Mountain-mint	Hoary Bat	Spiked False Oats
Blue-spotted Salamander	Jefferson Salamander	Tall Cinquefoil
Dillen Tick-trefoil	Longleaf Bluet	Tall Cinquefoil
Eastern Box Turtle	Narrow-leaved Glade Fern	Violet Wood-sorrel
Eastern Few-fruit Sedge	Narrow-leaved Horse	Virginia Copperleaf
False Hop Sedge	Gentian	
	Ragwort	

known population of dwarf bulrush in a river ecosystem and the only known population of purple giant hyssop in Connecticut. The corridor's floodplain forest also supports nearly the entire population of starry campion in New England. Levees and floodplain forest also provide habitat for bald eagle and other fish-dependent raptors such as the state listed northern harrier and osprey (see Appendix 3: Table 1). Some of the corridor's most dramatic levees are between Rainbow Dam and the confluence with the Connecticut River. The back of a levee may be the site of *vernal pools* and other *wetlands* *whose* diversity value was noted above.

Since few intact floodplain forests remain in New England, they are considered by The Nature Conservancy (TNC) to be "arguably the rarest forest type in the region." A study conducted by TNC in 2008-2009 surveyed eight sites on the Farmington River

and one site on Salmon Brook, in part to identify floodplain forests with the greatest conservation value. The two sites with the highest value, in terms of dynamic flooding regimes that still support typical floodplain forest communities, were 1.) at the confluence of the Farmington with the Connecticut River in Windsor, as far upstream as the I-91 Bridge, especially the large island at the confluence; and 2.) the mainstem of the Farmington River in Simsbury, with its meandering channel and multitude of oxbows. This area provides habitat for rare species such as the northern leopard frog and abundant wildlife such as herons, kingfishers, waterfowl and migratory songbirds (see Appendix 3: Farmington River Floodplain Forest Habitat). There are several other floodplain forests on the lower Farmington and Salmon Brook as well, the Fisher Meadow area in Avon being a notable example (see Figure 22: Alluvial Floodplain

Critical Habitat Subtype Communities and Figure: Floodplains and Riparian Buffers).

Biodiversity in the Brook and River

Traversing all these ecoregions are the diverse *aquatic communities* of Salmon Brook and the Farmington River. Overall, Salmon Brook supports 25 species of fish. The upper East and West Branches are highland streams that support native brook trout, brown trout, slimy sculpin and the spring salamander, all indicators of thriving *cold-water stream communities*. According to CT DEP scientists, there are exceptional coldwater fish communities at almost every site sampled in the Salmon Brook basin, with moderate to high abundance of native brook trout and slimy sculpin, as well as fry stocked brown trout and Atlantic salmon. Slimy sculpin, indicators of cold clean water, occur in almost every sample from every site. Such basin-wide distribution of high-quality fish communities is rare in Connecticut. Salmon Brook is considered by DEP fisheries biologists to be the best potential salmon habitat in the Farmington River watershed and one of the best in all of Connecticut. An intensive salmon restoration program has been implemented in this area during the last three decades with increasing viability rates of the fingerlings.

Communities of bottom-dwelling insects and other macroinvertebrates are also exceptional. Samples from Salmon Brook sites have high

diversity, especially in pollution-sensitive groups such as mayflies, caddisflies, and stoneflies.

The lower Farmington River mainstem produces the river's highest diversity of finfish, with over 30 species recorded in the recreational fishery. The lower river-bed gradient, and the resulting slower current, support a warm-water fish population, including small, largemouth, rock, and calico bass, yellow and white perch, chain pickerel, bluegill, white and channel catfish, northern pike and many pan fish. But the lower mainstem also supports cold-water fishes, thanks to cold springs along the riverbed and input from Salmon Brook.

Diadromous fish (those that spend part of their lives at sea), namely Atlantic salmon, American shad, alewife, blueback herring, American eel and sea lamprey, follow the colder water from the Farmington as it enters the Connecticut River to take up residency in the Farmington watershed for a part of their life history. At Rainbow Dam in Windsor, these species encounter a fish ladder that is in declining condition. Also, en route to the dam, the lowest reach of Farmington River is on the CT Impaired Waters list because of flow alterations caused by the dam's hydropower facility. Nonetheless, the CT DEP Fisheries Division reports that the lower river still supports a diverse and healthy fish population:

The robust mussel population may be partially responsible for return of the charismatic river otter to the lower Farmington River mainstem.

Fish Species of the Study area of the Lower Farmington River and Salmon Brook

Salmon Brook East Branch: American eel, Atlantic salmon, blacknose dace, brook trout, brown trout, common shiner, golden shiner, longnose dace, pumpkinseed, slimy sculpin, white sucker

Salmon Brook West Branch: American eel, Atlantic salmon, blacknose dace, brook trout, brown trout, common shiner, creek chub, golden shiner, grass pickerel, longnose dace, rainbow trout, sea lamprey, slimy sculpin, smallmouth bass, tessellated darter, white sucker

Salmon Brook Main Branch: American eel, Atlantic salmon, blacknose dace, blacknose dace, bluegill, brook lamprey, brook trout, brown bullhead, brown trout, common shiner, fallfish, golden shiner, grass pickerel, largemouth bass, longnose dace, pumpkinseed, rainbow trout, rainbow trout, Redfin pickerel, Sea lamprey, slimy sculpin, smallmouth bass, tessellated darter, white sucker, white sucker, yellow perch

Lower Farmington River: American eel, Atlantic salmon, blacknose dace, bluegill, brook trout, brown trout, fallfish rock bass, largemouth bass, longnose dace, rainbow trout, sea lamprey, smallmouth bass, tesellated darter, tiger trout, white sucker

The riparian system is under constant pressure from non-native invasive species.

“The mouth of the Farmington River where it meets the Connecticut River is the most diverse and one of the most important areas within New England in terms of fish resources. All 12 of the diadromous fish species thought to be present in the state are believed to be present at this location...It is one of two tributary streams in Connecticut that host an annual adult Atlantic salmon run and hosts one of the best shad runs in the state (other than the mainstem Connecticut). The confluence of the two rivers is a mixing zone for fish, and returning anadromous species mill around and determine where they want to go...This staging, milling, and delay have always made this area an important area for fisheries as the fish are more vulnerable to various means of capture. Fish that ascend the Farmington River...encounter their first set of rapids from the sea in the Poquonock area of Windsor...This also results in delays and milling, which also provide excellent opportunities for fisheries. In addition to the diadromous species, this lower river area hosts a wide diversity of ‘resident’ (non-diadromous) species, many of which move up the Farmington River in the spring from the Connecticut River. These fish include trouts, basses, sunfishes, catfishes, white sucker, yellow perch, and a variety of minnow species. Taken as a whole, there probably is not a larger number of freshwater and diadromous fish species aggregated anywhere else in New England.” (S. Gephard, CT DEP pers. comm.)

The CT DEP is now working to improve fish passage in the lower Farmington by constructing a state-of-the-art fish lift at Rainbow Dam. This project is currently in its design phase. Three miles upstream of Rainbow Dam, there is an obstacle to fish passage in the form of a high-velocity current through the breach in the obsolete Spoonville Dam, a former hydro facility damaged in the 1955 flood. Engineering plans are now completed for removal of Spoonville Dam and restoration of passable river conditions at this site. Funding for implementation is partially secured and the permitting process has begun. The improvements at Rainbow Dam and Spoonville Dam will greatly enhance access to about 50 miles of upstream habitat for diadromous fishes.

Freshwater mussels are also well represented in the Farmington, and are of special interest as one of the most highly endangered animal groups in North America. The study area contains all of the 12 mussel species native to southern New England, including Connecticut’s largest known population of the endangered dwarf wedgemussel and populations of the state-listed eastern pearlshell, eastern pondmussel, tidewater mucket, and yellow lampmussel (see Appendix 3; Table 1). Four of the five state-listed freshwater mussel species that are known to occur in the lower Farmington River have only been discovered in the last ten years and there is much to learn about the status and viability of these populations. Their presence indicates both good water quality and a diverse array of fish species on which the mussels depend for reproduction and dispersal. The robust mussel population may be partially responsible for return of the charismatic river otter to the lower Farmington River mainstem.

Biodiversity within a river corridor is often severely restricted or compromised because of extensive residential and industrial development. Given the long history of settlement here, the Lower Farmington River system’s remaining multi-level biodiversity is remarkable—but it is highly vulnerable. Factors that have favored biodiversity within this populated region are the establishment of federal, state and local exclusionary zones; the commitment of the ten Lower Farmington River towns and land trusts to water quality protection and open space acquisition; and watershed associations that foster stewardship, recreation and scientific study of the river on a regional scale. On the other hand, a number of factors threaten biodiversity and are detailed below. Protective actions must be maintained and expanded if the corridor’s natural riches are to persist over the long term.

Biological Diversity Protection Goal
Recognize, understand, protect and enhance the unique, rare, declining and characteristic native species and natural communities of the lower Farmington and Salmon Brook Corridors that contribute to the area’s biodiversity.



Spoonville Dam Photo: Joyce Kennedy

Threats to Biological Diversity

Declining Water Quality

Since many of the corridor's species are aquatic, many threats to biodiversity overlap threats to water quality. They are noted here but discussed in more detail elsewhere in the Management Plan.

- Discharge of sand and silt into the river from human activities can mask visual and olfactory cues for fish and invertebrates, or bury and smother stream-bottom habitats used for foraging, filter-feeding and spawning. Turbid water can also reduce dissolved oxygen by absorbing more sunlight and thus raising water temperature.
- Nutrient loading: When stream phosphate or nitrate levels increase due to runoff of fertilizers into streams, algal growth can skyrocket, with a cascade of disruptive effects on the stream community. The risk of phosphate and nitrate pollution rises as development results in increased areas of lawn and other landscaping.
- Various pollutants (e.g. petroleum products, bacteria) in stormwater runoff lower water quality and can reduce or extirpate populations of pollution-sensitive invertebrates.
- The discharge from sewage treatment plants contains residual pharmaceuticals that are biologically active. The impact on aquatic species in the Farmington is currently unknown.

Invasive Plants

The riparian system is under constant pressure from non-native invasive species. The list of invaders is extensive but includes Asiatic bittersweet, Japanese barberry, Japanese knotweed, European privet, and non-native honeysuckles. As newcomers to the local biological community, these species are less targeted by native grazers or pathogens. This advantage allows them to out-compete and exclude native species, and reduce biodiversity. River corridors are one of the most vulnerable areas for colonization by invasives. In the study area, critical habitats for rare native plants such as high floodplain forest are especially threatened by species such as Japanese barberry (*Berberis thunbergia*) and burning bush (*Euonymus alata*). One particular species at risk is *Silene stellata*, starry campion, for which the study area is the New England stronghold. Starry campion's narrow riverbank niche is subject to invasion by Japanese stiltgrass (*Microstegium*).

Fortunately there are many rare plant and priority community sites in the corridor that are not overrun with non-native species. However, invasives are present at most sites and abundant at some, so managing them is a necessity.

Loss and Fragmentation of Habitat

Habitat loss and fragmentation are universal threats to biodiversity, but in a river corridor they present special challenges. The area of

A major goal of the Farmington Valley Biodiversity Project was to provide biodiversity information to towns that would help them with intermunicipal land and river management.

riparian (riverbank) habitat is small relative to the whole landscape, so even minor losses of acreage can be significant. The riverbank is a narrow pathway for dispersal and migration of many species. It provides cover, feeding areas, navigational cues and linkage between habitats. The development of riverbank eliminates areas to rest, feed or hide, and severs travel routes.

The river too is severed, by dams and dam remnants that hinder the mixing of resident populations of fish and the travels of long-distance migratory fish to or from their spawning habitats. Obstacles in the lower Farmington River include the sub-optimal fish ladder at Rainbow Dam in Windsor, strong currents associated with the breached and non-functional Spoonville Dam in East Granby/Bloomfield, and the remnants of the Winchell-Smith/Gristmill Dam in the Farmington. The Upper and Lower Collinsville Dams are additional obstacles to fish passage.

Besides riverbank development and dams, more subtle habitat losses occur in the corridor. Sand plain and sand barren communities that support rare species often convert to forest unless managed to maintain their open character. Other open and semi-open habitats, apparent remnants of landscapes maintained by Native Americans by periodic burning, also support rare species and require active management in order to persist.

Changes in Flow Regime

Some of the biodiversity in river systems is maintained by seasonal (or less frequent) variation in flow. As a river's flow becomes less variable because of engineered flood control measures, those species that depend on the occasional extreme high or low water conditions for their continued success can eventually decline or disappear. A recent study in the Farmington and Salmon Brook corridor by The Nature Conservancy showed that specialist floodplain plants require inundation at least once every 2 years, or they will be replaced by upland forest species. Reducing the areas that are inundated every 2 years ultimately reduces the area of floodplain forest. Also, some plant species in the high floodplain forest community along the Farmington may now be at risk because they tolerate short term flooding but may not

thrive in the new, longer-duration periods of flooding imposed by controlled flows. Flow regime disruption is therefore a potential threat to this Outstanding Resource Value of the study corridor.

Stream biodiversity can also be threatened by diversion of water for private, commercial or industrial use if these activities are permitted to the point where instream flow is inadequate to support natural aquatic and riparian communities. The Farmington mainstem is already regulated in a way that maintains a minimum flow to support stream organisms. Similar protection would be desirable for Salmon Brook and other tributaries.

Altered Stream Channels

As noted in the Geology section of this Management Plan, the dynamic changes of the Farmington River and Salmon Brook channels and floodplains need to be better understood and accommodated. Development along the river and the engineered control of river flow serve to meet human needs but necessarily hinder the river's normal ability to rise, fall, meander, transport sediment, change its channel, cut off loops and form oxbows or spread over its floodplain and deposit silt. Ordinarily these physical changes have a combined effect that maintains a shifting mosaic of biological communities in the channel and floodplain. In contrast, the controlled river may have a physical condition that is less conducive to diversity, featuring excess erosion, scouring, and downcutting in some areas, excess sediment deposition in others, and a detrimental disconnection between the channel and the floodplain. Suppression of the river's dynamic physical rearrangements from year to year can also set the stage for an especially massive and destructive rearrangement in the event of a 500-year flood.

It is not possible to reverse-engineer the lower Farmington to the natural state that gave rise to its diverse biological communities. But new development should be based on up-to-date understanding of fluvial geomorphology. It should avoid new restrictions on river dynamics and instead provide ample space for the river to act. Wherever possible, the form and function of the channel should be restored, allowing the river to regain its habitat diversity and equilibrium.

Two other flow factors to consider are the increase in annual precipitation documented over the last several decades, and the greater runoff volume coming from land that undergoes development. Both put more water into stream channels, enlarging them over time. These also should be taken into account when managing the river for the future.

Incomplete Information

Biodiversity information for all ten corridor towns comes in part from studies sponsored by the Wild and Scenic Study Committee and that is summarized in the Appendices. These studies use information from the Connecticut Department of Environmental Protection Natural Diversity Database (NDDDB), the Center for Land Use Education and Research (CLEAR), recent field observations and other sources.

Another major source of information is the Farmington Valley Biodiversity Project (FVBP), organized by the Farmington River Watershed Association and published in 2006. It studied the towns of Avon, Canton, East Granby, Farmington, Granby, Simsbury and Suffield. A major goal of the FVBP was to provide biodiversity information to towns that would help them with intermunicipal land and river management.

Still, the information is far from complete. The FVBP only covered six of the ten towns included in the Wild and Scenic Study area and it was understood to be a first pass at quantifying biodiversity. Several plant communities and stretches of riparian corridor were bypassed and inventory of invertebrates was left out. Several of the other sources of information are works in progress. At the time of the Study, at least 42 state-listed species (endangered, rare, or special concern) were documented as occurring within the corridor, but the state NDDDB was being updated at the time and new species may be added. Likewise, the mapping of key habitats by CT DEP and the University of Connecticut was also in progress during the study and may identify habitats not highlighted here.

In short, more information is needed for management decisions to be based on the best possible understanding of the corridor's biological community. Equally important, there must be a process for conveying the information to those who formulate plans, policies and regulations.

Current Protections

Inland Wetlands and Watercourses Regulations

A town's Inland Wetlands and Watercourses Regulations have the potential to provide the most comprehensive protection to biological diversity in the river and stream corridors. These regulations may deal with stormwater runoff, upland review areas, floodplain protection and vernal pool protections, among other issues. Though judged adequate overall, the level of protection across the ten towns varies widely (see details in the appended *Municipal Plan and Regulation Review*).

Zoning and Subdivision Regulations

Other regulations that protect water quality also support biodiversity in aquatic and riparian habitats. For example, zoning regulations provide protection for floodplains, and some subdivision and zoning regulations deal with stormwater management and control of erosion and sedimentation. These measures are discussed more fully in the Water Quality section of this Management Plan and in the appended *Review*.

Forest/Timber Management Regulation

The regulations that apply to timber harvesting and forest management in some of the towns are intended to prevent erosion and protect water quality, but also protect biodiversity by keeping sediments out of watercourses and limiting areas of disturbance during forestry operations. Some towns require that forest management plans and practices be utilized and require special conditions for working in the regulated area, certain areas of the floodplain, and in the Farmington River Protection Overlay District.

Invasive Plants

Most towns have some type of policy or regulation that show a preference for native plant species. Examples include towns that encourage elimination of invasive plants and encourage the use of plants suited to the local habitat or that are native. Some towns also recognize the benefit of maintaining or enhancing environmental quality by managing non-native invasive species or requiring new buffers along wetlands or watercourses. One town prohibits the planting of invasive species listed in the state invasive species act.

It should be noted that regulation is only one tool for protection, though it is a powerful one. Towns also set a standard for river

protection in local planning documents such as Plans of Conservation and Development, and various policies and best practices that a town may adopt and use voluntarily.

Protection Gaps

Gaps in protection were identified as a result of comparing known biological diversity threats with existing protection measures. Gaps in protection were found, to varying degrees, for all of the known threats to biodiversity. Some of these can be addressed with regulations, while some can be addressed with non-regulatory approaches.

- DEP's Non-Native Invasive Plant Species Program is not well used by towns.
- There is a lack of recognition for low impact development techniques and their incorporation into regulations to minimize loss and fragmentation of habitat.
- Towns can make better use of Connecticut enabling statutes to adopt flexible regulations concerning density and development patterns to focus growth in particular locations to protect biodiversity.
- Towns can make better use of existing biodiversity maps that identify high priority areas for conservation, and/or update their inventories and maps of natural resources. This information is necessary for generating well-informed Plans of Conservation and Development.

Biological Diversity Management Priorities

1. Achieve the Management Plan's goals for Water Quality.
2. Prevent, slow or reverse infestations of invasive species in corridor plant communities.
3. Prevent or reverse the loss and fragmentation of riparian and instream habitat, and open space.
4. Explore the need to mimic natural flow variations to maintain rare communities.
5. Update and expand the database for biodiversity in corridor towns.

Actions, Tools & Strategies

1. Achieve the Management Plan's goals for Water Quality (see Water Quality ORV)
2. Prevent, slow or reverse infestations of invasive species in corridor plant communities.
 - Use information and recommendations in the FVBP Rare Plant and Natural

Community Inventory (updated as needed) to set priorities for protection or restoration of corridor sites infested with invasive species.

- Encourage towns to reference the DEP's Non-Native Invasive Plant Species Program in their applicable regulations.
 - Provide assistance to Land Trusts and other private landowners in the corridor to apply for US Department of Agriculture/Natural Resource Conservation Service (NRCS) Wildlife Habitat Improvement Contracts and other grant/incentive programs for removal of invasive plants and restorative plantings.
 - Maintain a current database and review of contractors who engage in invasive removal and restoration that have been contracted under the WHIP Program (NRCS Wildlife Habitat Incentive Program) or other grant/incentive programs.
 - Provide resources to monitor invasive plant/habitat restoration projects.
 - Develop an invasive management strategic plan that is based on the flow direction of the lower Farmington and Salmon Brook (upstream to downstream).
 - Develop a broad-based partnership of public and private entities to assist in the execution of the strategic plan for identification, eradication and management of invasive species.
 - Specifically target invasive species that threaten floodplain forest, and/or populations of Starry Campion.
 - Rigorously monitor and evaluate the success of various invasive management strategies in order to identify practices that are most effective, and cost-effective, over time.
3. Prevent or reverse the loss and fragmentation of riparian and instream habitat.
 - Seek Greenway status for the Salmon Brook and Farmington River corridor from the State of Connecticut Greenways Council (Greenway status for the Salmon Brook was attained during the Wild and Scenic Study).



Photo: Tom Cameron

Prevent or reverse the loss and fragmentation of riparian and instream habitat.

- Encourage stewardship of the riparian habitat through landowner education and assistance with private transfer of land either through easements in favor of local land trusts, gifting or purchase that will create a riparian greenway along the river system.
 - Actively protect and manage sand plain communities that occur in the corridor to minimize development and prevent reversion to other forest types.
 - Work closely with power companies to manage plant communities in power line rights-of-way.
 - Promote wetland and watercourse regulations that protect streamside vegetation in addition to the existing statutory protection from impact to the watercourses and wetlands themselves.
 - Promote the adoption of flexible regulations concerning density and development patterns to allow towns to focus growth in particular locations and at different densities to biological diversity. Utilize existing tools as allowed under Connecticut enabling statutes to promote patterns of development identified in their plans of conservation and development and open space plans.
 - Pursue removal of obsolete dams or dam remnants, or construction of fish passage around such barriers. Priorities are renovating fish passage at Rainbow Dam, removal of Spoonville Dam and improved fish passage at Winchell-Smith/Gristmill Dam.
 - Identify stream crossings that block fish passage, e.g., locations where culverts are perched above the low-water level of the stream. Incorporate stream crossing improvements in future road repairs or construction.
 - Implement the most current recommendations for the management of freshwater mussel populations in the lower Farmington River and Salmon Brook.
 - Encourage new approaches to cooperative purchase of open space by corridor towns.
 - Promote use of low impact development techniques (LID) and Connecticut enabling statutes that permit broad authority to adopt flexible regulations concerning density and development patterns allowing towns to focus growth in particular location. Both of these are effective tools in the preservation of open space and in minimizing land disturbance in overall site development plans.
 - Strengthen and use existing landscaping requirements that can protect vegetative buffers.
 - Inventory and map natural resources along the corridor. If appropriate, amend Plans of Conservation and Development to incorporate results of studies and articulate goals and policies for river protection.
 - Follow guidelines of the “Biodiversity Conservation Checklist” for towns, set forth in *From Planning to Action: Biodiversity Conservation in Connecticut Towns*, Metropolitan Conservation Alliance Technical Paper Series No. 10, ISBN 0-9724820-9-5.
4. Maintain adequate flows and explore the need to reproduce natural flow variation.
- Support state streamflow regulations that ensure enough flow in state waterways to support their natural aquatic communities.
 - More thoroughly assess the threat posed by controlled flows to the long-term biodiversity of the Farmington River corridor, especially in floodplain forest communities.
 - Consult as needed with the Metropolitan District Commission, the Army Corps of Engineers and the Farmington River Power Company to assess whether flows could be modified on occasion to mimic the natural events that help maintain biodiversity of stream communities.
 - Conduct an extensive geomorphic study of the lower Farmington River, with focus on channel morphology, bank conditions, large woody debris dynamics, gully and headcutting in tributaries, and the origin, transport and fate of sediments. Project outcomes should include the identification of stable versus unstable reaches, an assessment of the vulnerability of mussel populations and management recommendations.

Archaeologists have recovered artifacts from at least 103 sites along the river and its tributaries.

5. Update and expand the database for biodiversity in corridor towns.
 - Initiate a Biodiversity Project to cover the towns of Hartland, Windsor, Burlington and Bloomfield.
 - Follow recommendations in the FVBP summary documents regarding continued biodiversity field work and protection of riparian communities of Avon, Canton, East Granby, Farmington, Granby and Simsbury.
 - Furnish up-to-date biodiversity information to towns in a timely way and keep abreast of proposed revisions of town ordinances, policies, plans of conservation and development and other processes that could benefit from incorporating this information.
 - Organize an inventory of rare invertebrates as a way of identifying significant biodiversity hotspots in the corridor; give sand plain communities a top priority.
 - Organize an inventory of low floodplain forest and slough complexes for rare plants and rare communities.
 - Support DEP in their Salmon Brook fish counts.
 - Support and expand established amphibian and turtle monitoring programs.
 - Survey near power lines for undocumented occurrences of rare plants.
 - Conduct systematic and repeatable mussel surveys to document the distribution, health and habitat of endangered mussel populations in the Farmington River and to provide a basis for long-term monitoring. These efforts should include an evaluation of potential habitat within tributaries, an assessment of continuity with the mainstem and recommendations for improving continuity and promoting tributary populations.

Outstanding Resource Value: Cultural Landscape

Overview

The cultural landscape of the lower Farmington River and Salmon Brook includes both American Indian and post-contact resources recognized as nationally and

regionally significant. Some of the structures and some other indications of past and present human activity found along the streams are Outstanding Resource Values because they are exceptional examples of Connecticut's and the New England region's ethnic, cultural and economic development. Although they are not necessarily unique to the Study Area, which includes approximately a quarter-mile wide border along both sides of the waterways, they are important pieces to understanding the history of the entire region, and one should consider their historical significance in regional and national historical contexts like native and colonial settlement and land use, slavery, and urban and agricultural industrialism (specifically tobacco).

American Indian Archaeological Sites

Initial human occupation of the area along the lower Farmington River and Salmon Brook dates back to the end of the Pleistocene about 11,000 years ago. Those people adapted their subsistence culture to a post-glacial landscape in the Early Archaic period between 10,000 and 8,000 years ago (Feder and Banks, 6). As the post-glacial forest developed during the Middle (8,000–6,000 years ago) through Late Archaic (6,000–4,000 years ago) and Terminal Archaic (4,000–3,000 years ago) these early inhabitants established stable economic systems, and the river functioned as a camping and trading center. Settlements grew larger with the advent of farming (primarily maize, beans and squash) during the Woodland period (3,000–400 years ago). (Feder and Banks, 6) See Figure 29: Prehistoric Archaeological Sites.

Archaeologists have recovered artifacts from at least 103 sites along the river and its tributaries. Some artifacts have been found from the Paleo-Indian Period (11,500–10,000 years ago) and many have been discovered from the Archaic (10,000–3,000 years ago) and Woodland Periods (3,000–400 years ago). Ancient campsites, village sites, sites of stone tool manufacturing, pottery, rock shelters and trading sites have been discovered near the river. There is also evidence of fishing camps. Indian trails followed the river, and a large trading network developed along them.

There are sites in the Study Area corridor of long-term, continuous or repeated human occupation. The Lewis-Walpole Site located about where the Farmington and Pequabuck

Some key findings on the status of Cultural Resources in the lower Farmington and Salmon Brook:

Nationally and Regionally Significant Archaeological Record, Settlement Patterns, Industrial and Economic Development, Abolitionism and the Underground Railroad and the Tobacco Valley

- Nationally and Regionally Significant Archaeological Record:
- Nationally Significant Archaeological Sites associated with the river, including the Indian Hill site and the Lewis-Walpole site.
- Over 100 prehistoric archaeological sites discovered to date in lower Farmington River and Salmon Brook corridors.
- Continuously Occupied Human Settlement for up to 11,000 years.

Settlement Patterns/Industrial and Economic Development:

- The archaeological resources and some of the structures along the lower Farmington River and Salmon Brook are Outstanding Resource Values because they are exceptional examples of Connecticut's and the New England region's ethnic, cultural and economic development.
- Farmington Canal represented the height of engineering in its time, and upon completion it was the longest canal in New England.
- Historically river-dependent communities such as Windsor, the first English settlement in Connecticut and the National Register-listed Historic Districts of Unionville, Tariffville and Collinsville and the Avon Center Historic District have significant surviving Outstanding Resource Values reflecting the river's agricultural, industrial and manufacturing heritage.

Underground Railroad:

- Cluster of Underground Railroad Sites with the Town of Farmington know as the "Grand Central Station" of the Underground Railroad.

Tobacco Valley:

- Nationally Noted Prime Agricultural Soils have supported agriculture for over 11,000 years.
 - Tobacco farming historically and culturally significant due to the important role the crop played in the economic and demographic development of the state and for the international recognition it gained as an exceptional agricultural product.
-

Archaeological dig Photo: Kenny Feder



.....the Farmington Canal represented the height of engineering in its time, and upon completion it was the longest canal in New England.

Rivers meet is a unique, nationally significant site of continued human occupation throughout all of the time periods mentioned above. It was most frequented in the Middle Archaic Period. The full Archaeological Assessment of the Lower Farmington River and Salmon Brook can be found in Appendix 4.

Settlements and trading areas were set back from the river, and land bordering the river was largely undeveloped. In the Woodland and Contact Periods meadow areas near river bends and calmer places were village sites and planting places. Examples are Tunxis meadow in Farmington, Massaco meadow in Simsbury and the meadow in Windsor. The alluvial soils of these meadows were full of nutrients from the river and provided excellent conditions for the cultivation of crops and expansion of agriculture.

When English colonists arrived in the seventeenth century, native peoples lived in villages at current-day Windsor, Farmington and Simsbury. The native people in the Farmington Valley had named the river *Tunxis Sepus* ("bend on the little river").² With the arrival of explorers, missionaries, and migrants from Europe, eventually the river's name was changed to "Farmington," although several area businesses and roads still bear the "Tunxis" name. More importantly, Europeans altered these American Indian communities economically, socially, culturally and often politically. When English Colonists came they acquired Indian lands for farming, sometimes by force and sometimes through cooperative land deals, and they traded such things as iron kettles, cotton cloth and iron axes for Indian furs and corn. Soapstone that the American Indians quarried from outcroppings in rock ridges was also a valuable trading commodity. The Europeans traveled along the Indian trails, and later constructed roads along them. For example, the present Connecticut Route 44 approximately follows the old North West Path.

Post-Contact Developments

By the nineteenth century, signs of traditional Indian life were difficult to locate in the Study Area landscape because colonists, immigrants and their descendants had become established in the area. The majority of sites from the post-contact period that have Outstanding Resource Value recall early colonial New

England settlement patterns, nineteenth century industrialism and rise of industrial agriculture as exemplified by tobacco farming. Each of these historical developments introduced new populations of immigrants, whether settlers or migrant laborers, onto the landscape. For example, Irish immigrant laborers made up a large part of the workforce that built the Farmington Canal. The Study Area also includes evidence of significant Underground Railroad activity.

Settlement Patterns

Connecticut's early settlements were based upon English agricultural villages. Rather than individual farms, settlers built their homes in clusters surrounded by the outlying fields and farms. Several historic districts along the Farmington River reflect this pattern including the Palisado Avenue and Broad Street Historic Districts in Windsor, the East Weatogue and Terry's Plain Historic Districts in Simsbury, the Farmington Village Historic District and the Granby Center Historic District. Together, these areas include hundreds of rural and urban properties that are outstanding examples of historic architectural styles from the eighteenth and nineteenth centuries.

Because of the political structure with which the English established their colonies, many political entities like towns, began as extensions of existing "parent-towns" such as Simsbury and Windsor, but broke off to form independent communities. For example, current day Granby, originally known as the Salmon Brook Settlement, was originally part of Simsbury. Throughout the early eighteenth century, Connecticut Colony officials argued with individual towns over boundary lines across the region.

Economic Development: Manufacturing and Transportation

Some of the best examples of the manufacturing that secured Connecticut's role in the nation's economic history were located along the lower Farmington River.³ Although earlier agricultural settlements had harnessed the river's waterpower for gristmills, sawmills, and fulling mills, entrepreneurs established waterpower industries and factories all along the river and its tributaries. The National Register-listed Historic Districts of Unionville, Tariffville and Collinsville, and

2. Christopher Bickford, *Farmington in Connecticut* (Canaan, N.H.: Phoenix Pub, 1982), 1.

3. Christopher Bickford, *Farmington in Connecticut* (Canaan, N.H.: Phoenix Pub, 1982), 241, 249.

Historical path of the Farmington Canal Photo: Brooke Martin



the Avon Center Historic District have the most significant surviving ORVs reflecting the river's small-scale rural industrial and manufacturing heritage. They also include examples of workers' and industrial architecture of the late nineteenth century. For example, the Collins Company, beginning in the 1820's and for which Collinsville is named, manufactured sharp edged tools and developed a global market that lasted into the 1960s. Also, by 1850, twelve shops and factories operated in the village of Unionville in Farmington. Unionville hosted the Cowles Paper Company and the Upson Nut Company, both of which had national markets.

Although they are not within designated Historic Districts, there are other examples along the Farmington River that reflect Connecticut's important role in the development of the industry and technology that has contributed to the nation's economy. One is the Hartford Electric Light Company (HELCO) dam, remaining only as remnants, which is located near Tariffville. Dating from the late 1800's it powered a HELCO hydroelectric plant which is thought to be the first plant to provide electricity through aluminum wires. A second example is the former dam of the Cowles Company which powered "the nation's first commercially successful electroplating operation". Cowles Company produced silver-plated spoons, forks and butter knives, giving the dam and the area along the river the name "Spoonville".

In order to bring both agriculture products and manufactured goods to market, adequate transportation was required. In the late eighteenth century, investors established a

system of turnpikes to meet economic needs following the American Revolution.⁴ The turnpikes connected cities like Hartford and New Haven.⁵ However, for the towns on the west side of the Metacomet Ridge, the turnpikes did not provide an adequate route which was comparable to the Connecticut River for moving goods. The Farmington Canal was financed and built to provide an effective shipping route on the west side of the ridge. Goods from the interior that reached New Haven by canal boat could be sent on to New York City by ship. For example, with two canal basins, the town of Avon shipped a number of agricultural products, such as cheese and lumber, to New Haven via the canal. Following the completion of construction of the Farmington Canal in 1829, the region's economy expanded to include more small-scale manufacturing and eventually commercial and industrial development in the towns of the Study Area. In both its conception as an economic venture and in its technological design, the canal reflects early nineteenth century movements in America to stimulate regional economic growth. Engineered by Benjamin Wright, chief engineer of the Erie Canal⁶, the Farmington Canal represented the height of engineering in its time, and upon completion it was the longest canal in New England. However, the Farmington Canal was underfinanced and required constant maintenance. By the 1840s, Farmington Canal failed as a financial investment, but the economic activity of the industrial villages of Collinsville, Unionville, Tariffville and Avon Center encouraged development of a branch of the New Haven-Northampton Railroad line from Farmington through Unionville and Collinsville (see Figure 30: National Register of Historic Places and Farmington Canal).

Economic Development and the Underground Railroad

Because Farmington River Valley communities had natural resources allowing for agricultural development, and small manufacturing industries, and they had developed infrastructure for commerce. Because of these aspects of the area as well as local anti-slavery sentiments, the Farmington Valley supported

4. Christopher Bickford, *Farmington in Connecticut* (Canaan, N.H.: Phoenix Pub, 1982), 1.

5. Horatio T. Strother, *The Underground Railroad in Connecticut* (Middletown, CT: Wesleyan University Press, 1962), 163-165.

6. <http://www.yale.edu/ynhti/curriculum/units/1981/cthistory/81.ch.04.x.html#d>



Collinsville Axe Factory

Photo: Tom Cameron



Collinsville Axe Factory reflection

Photo: Tom Cameron

the movement of runaway slaves escaping to the North. They traveled along a system of shelters that historians refer to as the Underground Railroad. The Underground Railroad was essentially a locally organized network to help runaway slaves escape from the South, by hiding them, assisting them to the next safe haven, and ultimately by finding them transportation to their destination, usually Canada.

Newspapers and proceedings offer the strongest documentation corroborating the oral tradition that the Farmington Valley indeed participated in the Underground Railroad activity. The largest cluster of activists lived in the center of Farmington, with over 100 pre-1835 homes, located just east of the Farmington River, making up the town's well-preserved Historic District. Some of those homes likely served as Underground Railroad stations. Farmington, then a largely agricultural community, served as a hub for various Underground Railroad routes and abolitionist activism. The town's location and concentration of abolitionists made it a highly trafficked segment of a larger migratory pattern for fugitive slaves and in fact has been referred to as the "Grand Central Station" of the Underground Railroad. Fugitive slaves on their way to Canada came through Connecticut by various routes. One likely route had escaping slaves arriving in the port cities of New Haven or New London and traveling up the west side of the Connecticut River Valley to Canada. From New Haven many would go on to Meriden, Southington, or Waterbury and then to Farmington. Farmington was ideally located

between Hartford and New Haven with a road to Hartford and Middletown. The stations there would guide people along the Farmington River or nearby roads through Hartford, Bloomfield or Avon, then to Simsbury and Granby (and on to Springfield, Massachusetts). There is very little evidence that participants used the Farmington River itself for travel. However this cluster of sites represents a physical network of properties across a shared cultural landscape, one that lay adjacent to the river and owed its development as part of the Underground Railroad to the agricultural, commercial and manufacturing opportunities located there that the river supported.

The Town of Farmington not only supported slaves escaping from the South, but also played a major role in the Amistad affair. Africans from Sierra Leone who were to be sold as slaves captured the ship in which they were being transported and were tried for mutiny in New Haven. The case attracted the attention of abolitionists who mounted a legal defense for the Africans. After the Africans were freed in 1841 as a result of a judgment by the U.S. Supreme Court, they were housed in Farmington while funds were raised to honor their wish to be returned to Sierra Leone. In Farmington they enjoyed a level of freedom, and some planted and raised crops during the time they lived there.

Economic Development: Industrial Agriculture

In the English colonies, slavery began when Virginia's John Rolfe identified tobacco as a profitable crop in the early seventeenth century. Tobacco fueled the growth of an economy based on slavery and the plantation system in the South, but in Connecticut, long recognized as a producer of fine tobacco, tobacco growing involved paid laborers, not slaves. The tobacco industry was once one of the state's largest sources of income. Its role in Connecticut's economic development illustrates the state's complex identity as a simultaneously agricultural and industrial economy. The increased popularity and economic value of tobacco resulted in a proliferation of tobacco farming that can be seen throughout the Farmington Valley's historic record.

Tobacco farming in the Farmington Valley is historically and culturally significant due to the important role the crop played in the economic and demographic development of



Agriculture along the river
Photo: Wanda Colman

Underground Railroad... stations there would guide people along the Farmington River or nearby roads through Hartford, Bloomfield or Avon, then to Simsbury and Granby...

the state and for the international recognition it gained as an exceptional agricultural product. Numerous National Register nomination forms documenting the region note sites of tobacco cultivation. First grown and used by the region's native peoples, colonists grew and even exported tobacco by the early eighteenth century. The profound growth of the tobacco industry in response to the commercialization of cigar manufacturing through the 1800s changed the Farmington Valley landscape not only with regard to the types of crops sown in its fertile soil but also in respect to the architectural landscape. The tobacco barn (or "shed"), a simple yet functional and refined example of vernacular architecture, is the most prevalent vestige of this rapidly disappearing industry.

In July, 1899, as part of the first national soil survey, the Secretary of Agriculture authorized the examination of a section of the Connecticut River Valley, of which the Farmington River is a central feature, and found the region's sandy, rich, and well

drained soils were ideally suited for raising tobacco. By 1902, only two years after the Connecticut Experiment Station's first tests, production of Connecticut shade-grown tobacco had jumped to 700,000 pounds. This rapidly increased to 1,800,000; 4,600,000; and 8,600,000 pounds respectively for 1910, 1919, and 1923. The development of Connecticut shade-grown farming effectively resulted in the industrialization and specialization of tobacco agriculture. As the cultivation of shade-grown tobaccos grew more profitable, fields of broadleaf were slowly replaced by acres of white tents sprawling across the landscape. Due largely to economic pressures, specifically the high infrastructure costs of raising shade-grown tobacco, the production of the crop increasingly fell under the control of large corporations. By 1936 entities such as the American Sumatra Corporation, the Hartman Tobacco Company, Cullman Brothers, Inc., and the Consolidated Cigar Company, controlled much of the Connecticut land planted with shade-grown tobacco.⁷

7. Tercentenary Commission of the State of Connecticut, Committee on Historical Publications, *The History of Tobacco Production in Connecticut* (New Haven: Yale University Press, 1936), 17.

The Lower Farmington River, like the previously designated upper River, offers many outstanding cultural resource values that document long-term human occupation by diverse ethnic and socioeconomic groups and show the use of natural resources for sustained settlement and economic development.

Thus by the twentieth century, the industry altered the demographic and ethnic makeup of the region by recruiting migrant farm workers who made large-scale tobacco cultivation in Connecticut possible and who worked to improve and regulate non-union labor conditions in the state. By World War I, farmers made arrangements with southern schools that brought African American teenagers and college students to work the tobacco fields in the summer. Civil Rights leader Martin Luther King was one of the young men to spend a summer in Simsbury in 1944 working in tobacco fields. During World War II, the tobacco industry also recruited labor from Jamaica. After World War II, Jamaicans and Puerto Ricans would fill these jobs through to the 1980s when machines and foreign laborers, many from Mexico and Laos, replaced them.⁸ The National Register has not identified any physical buildings or vernacular structures in the region that recall this labor history, but there are remnants of migrant worker housing which resembled boarding houses or barns remain such as the one on the banks of the West Branch Salmon Brook on Broad Hill Road in West Granby. See Figure 31: Existing Agricultural Land and Prime Farmland Soils.

Conclusions

The Lower Farmington River, like the previously designated upper River, offers many outstanding cultural resource values that document long-term human occupation by diverse ethnic and socioeconomic groups and show the use of natural resources for sustained settlement and economic development. While the focus of the Farmington River and Salmon Brook designation as a National Wild and Scenic River is on its outstanding natural and recreational resources, further development along the river needs to take into account the continuous human relationship with the river. The natural and the cultural are not always easily distinguished as people and their settlements have historically used the river for agricultural and industrial purposes. Documentation and recognition of historic properties through programs like the National Register of Historic Places identify many of the remnants of this relationship, but these efforts at preservation have likely

not identified all eligible properties, nor has everything survived in physical form. Those properties that are preserved are not always compatible with the public's changing definitions of historical significance or nature, or even people's recreational preferences. Town ordinances, state conservancies, conservation easements, transfer of development rights, and ownership by land trusts, towns and the state protect some historic sites and historically significant open land in the area.

Farming continues to provide a local source of fruits, vegetables and wines. Farms along the river include The Pickin' Patch in Avon and Rosedale Farm in Simsbury. However, preservation efforts are often dependent on economic impetus and changing notions of historic significance. It is therefore critical to recognize multiple themes in the history of settlement and economic development along the Lower Farmington River and Salmon Brook in order to recognize and identify the historically significant aspects of the region's cultural landscape.

Cultural Landscape Protection Goal

Conserve the archaeological and historical heritage of the river corridor and develop interest in this heritage, strengthening residents' connection to the river and enriching the experience of visitors.

Threats to Cultural Landscape

Threats to the cultural landscape include threats to archaeological and historic sites, as well as threats to traditional uses of the river corridor such as farming, fishing and other recreational activities. Here are some specific examples of ways that the cultural landscape resources are threatened:

- Loss of farms to development.
- Building and road construction that destroys important archaeological, historic or scenic sites.
- Deterioration or removal of historically significant buildings such as historic taverns, homes, factories.
- Deterioration or removal of bridges with historical or architectural value.
- Development that disregards archaeological resources.

8. B. Harrison, "Mobility, Farmworkers, and Connecticut's Tobacco Valley, 1900–1950," *Journal of Historical Geography* (2009), doi:10.1016/j.jhg.2009.07.002; Ruth Glasser, "Puerto Rican Farm Workers in Connecticut," *Hog Rover Journal* (Winter 2003).

Support local agriculture as part of the fabric of our communities.

- Disappearance of stone walls due to sale or development.
- Loss of historically important views and vistas to development.
- Cutting of historic trees, witness trees and trees that define historic landscapes.
- Loss of economic vibrancy of traditional town centers.

Current Protections

There are several towns that have Historic District Commissions and have established historic districts in the Study Area.

Recognition of the importance of historic preservation takes some regulatory form in most of the towns. Fewer towns acknowledge the importance of protecting archaeological resources. Requiring an archaeological reconnaissance survey as part of the subdivision permitting process is an example of a strong regulation protecting these resources.

The majority of towns regulate tree preservation in some form. Objectives include protecting trees for aesthetics, shade and scenic vistas, as well as for protecting natural features and ridgelines. Within the Farmington River Overlay District in the towns of Canton and Hartland, trees are important for maintaining a filtered view of the river. Regulations also recognize and protect trees as a tool in preventing extensive site disturbance, and in special areas such as along Talcott Mountain ridge.

Gaps in Cultural Landscape Protection

In spite of the existing protections, regulations vary greatly from town to town, lack any uniformity or coherence among the towns and are incomplete tools even in towns with the best requirements. Examples of regulations, policies and tools that are in use in some towns, but not in others include historic districts, national and state register listings, archaeological reviews as part of subdivision development, ridgeline protections, open space protection programs, village center zones, zoning regulations sensitive to adaptive reuse, regulations that protect shade trees and policies and regulations that support agriculture (see www.ctplanningforagriculture.com).

Cultural Landscape Management Priorities

- Inventory archaeological and historic resources and scenic roads within the river corridor and establish protections for them (as allowed under existing laws).

- Provide educational materials in various formats interpreting historic and archaeological resources.
- Support local agriculture as part of the fabric of our communities.
- Promote heritage tourism.
- Consider historic and archaeological resources in open space acquisition.
- Promote regulations that favor adaptive reuse of historic structures and consideration of archaeological resources.

Actions, Tools & Strategies

A wide array of regulatory tools is available under state law to protect cultural landscapes. However, regulation is not the only and often not the most effective means of protection. Information and education of the public and officials can go a long way to protecting the heritage we value. This best begins with an inventory of resources. Tax, grant and other incentives can also be used effectively. Filling the gaps in protection can include the following:

1. Encourage towns to establish development regulations that take archaeological resources into account and utilize the Archaeological Indicator tool that predicts the potential presence of resources along the river based on 12 variables (see Archaeological Assessment Report in Appendix 4 and Figure 29: Potential Archaeological Sensitivity Sites).
2. Conduct an in depth archaeological investigation of the Craig Mill complex located on the Salmon Brook.
3. Support open space and farmland protection.
4. Support the work of agricultural commissions.
5. Support of existing and new local historic districts.
6. Increase public knowledge of significant cultural sites.
7. Support and encourage use of existing programs and regulations that benefit and protect cultural and historic resources such as the National Trust Main Street program.
8. Develop a knowledge base about grant and other programs to protect historic structures.
9. Protect historically significant mines, quarries and caves.

10. Support ridgeline and high point protections that minimize the impact of developments.

Outstanding Resource Value: Recreation

Overview

The Farmington River and Salmon Brook provide corridors with exceptional recreational opportunities. The variety of boating, fishing and water-based recreational activities is regionally unique due to the consistent year-round flows, clean water and quality of the resources. These watercourses can be experienced by boaters of many types and skill levels due to the diversity of paddling opportunities, ranging from world-class whitewater kayaking to flatwater paddling. The high quality fisheries of the Farmington and Salmon Brook's diverse and well-preserved aquatic habitats also provide for exceptional fishing. Salmon Brook is of particular note,

and its high quality cold water habitat supports an abundance of native brown and brook trout, with very few warm water species. Trout thrive in cold-water environments, and Salmon Brook offers the vegetated riparian buffers that are necessary to provide shade and maintain lower water temperatures year round. It is considered by many anglers to be one of the best fishing streams of New England. Numerous public access points allow locals and visitors to take advantage of these and other recreational resources.

Based on the study *Use and Economic Importance of the Lower Farmington River and Salmon Brook* (see Appendix 5 for full report), the river, the brook and their corridors are highly valued by residents and recreational users who strongly support a Wild and Scenic Rivers designation as a way to further river protection. Survey respondents' support is based in part on the sense of place that the lower Farmington River and Salmon Brook

Some key findings on the status of Recreational Resources in the Farmington and Salmon Brook:

- The Tariffville Gorge provides a premier whitewater paddling destination and has been the location for world class paddling completion. It is one of very few rivers in the east where there are year-round paddling opportunities.
- There is a broad range of boating activities—from flat-water to mild moving waters to sections of class II and III white water for experienced paddlers. It is easy for people to take advantage of these activities, since there are public access points and parks within every Study Town.
- Regionally significant opportunities for fishing exist in the lower Farmington River.
- The clean cold-water trout fisheries of the Salmon Brook provide some of the most outstanding opportunities for angling anywhere in Connecticut.
- A conservative estimate of the number of recreational visits to the streams from mid-May to mid-September is over 124,000 per year.
- There is an extensive network of trail systems within the Study Area including six State of CT officially designated greenways that follow the watercourses: Farmington River Trail, Farmington Canal Heritage Greenway, Metacomet Ridge System, Blue Blazed Trail system, the Shade Swamp Sanctuary and the West Mountain Trails. The Salmon Brook corridor was recently officially designated as part of the state greenway system.
- Exceptional birding opportunities exist because the State of Connecticut overlaps the southern boundary of northern species and the northern boundary of southern species, so species abundance is unusually high, and the river corridor provides good nesting habitat and is a migration corridor as part of the Atlantic flyway.

provide, as well as the diverse recreational options which the watercourses offer.

Local residents are currently the primary users of the lower Farmington River and Salmon Brook corridors. A conservative estimate of the number of visits from mid-May to mid-September made to these waterways is over 124,000 in an average year. Most visits are short, with two hours representing a typical experience with the river. Because the people who use Salmon Brook and the lower Farmington River are mainly local, the economic impact of the waterways is presently lower than that of the upper Farmington River. The upper Farmington River, currently a more widely recognized trout fishing venue, has an economic impact of about \$3.6 million per year compared to \$1.2 to \$1.6 million for the lower Farmington River and Salmon Brook. This is understandable since there are few lodging and food costs associated with the many short local visits that typify its current use. Notable exceptions exist, however. For example, the Tariffville Gorge is a nationally recognized whitewater kayaking site. The



Tariffville Gorge Triple Crown Race Photo: Bill Duncan

World-class whitewater
Photo: Bill Duncan



recent Tariffville Triple Crown Whitewater Races, which drew competitors and spectators from nine states and Canada, suggests that the lower Farmington River has an untapped economic potential. In the above-mentioned Economic Study, the Real Estate portion indicated that home buyers are willing pay approximately \$14,000 more to be within one mile of the Farmington River and Salmon Brook. Additionally, some local businesses like the Collinsville Canoe and Kayak depend on the river for their success. While many small businesses are less directly connected to the river, owners have suggested that a Wild and Scenic designation could attract attention and visitors to the region, which would enhance their profits.

This section of the Lower Farmington River and Salmon Brook Management Plan highlights a few of the recreation opportunities offered by the streams and their corridors.

Paddling

The lower Farmington River offers a range of boating activities, ranging from flatwater and slow moving water to sections of class II and III white water for experienced paddlers. It is easy for people to take advantage of these activities, since there are many public access points.

From the Collinsville Dams to the Route 4 bridge in Farmington, the river provides a series of Class II drops and pools, passing under an iron railway bridge (now part of the Farmington River Trail), and flowing across an old gravel pit created by past glacial activity. In Farmington, the river abruptly turns northward, deflected by a terminal moraine deposited in the last Ice Age that blocked the river's southward path. An important location along the river in Farmington is the Lewis-Walpole site, located just east of the confluence of the Farmington and Pequabuck rivers. This is one of the most important archaeological sites along the lower Farmington and, in fact, is one of the most significant sites in all of southern New England (see Archaeological Assessment in Appendix 4 for details regarding this site).

From the Route 4 Bridge to Tariffville Park in Simsbury, the river is flatwater, with ample access points. This is an excellent area for beginning paddlers, or those seeking a more relaxing river experience. Local river

A conservative estimate of the number of visits from mid-May to mid-September made to these waterways is over 124,000 in an average year.

Hiking the New England National Scenic Trail

Photo: Damon Hearne



outfitters provide rental boats and transport, making this truly an accessible stretch of river. These same properties make this stretch a popular location for crew teams to practice. Landmarks in this stretch include ruins of the Farmington Canal and trails along Fisher Meadows in Avon. Wildlife viewing opportunities may include the rare yellow-billed cuckoo and hooded warbler or sunbathing turtles, including the uncommon musk and wood turtles. There are views of Talcott Mountain and the Gifford Pinchot Sycamore, the largest tree in CT. The Salmon Brook enters the river along this stretch.

The reach from Tariffville Park in Simsbury to Rainbow Reservoir in Windsor includes Tariffville Gorge, a spectacular rapid that can be run year-round (see Figure 35: Tariffville Gorge Aerial). There are very few rivers in New England and beyond where running world-class white water throughout the summer months is possible. The Gorge has been the location of National and Olympic Trials, New England Championship competitions, and National Canoe Poling competitions. In 2009 and 2010, the New England Whitewater Triple-Crown Championships brought world-class canoe and kayak competition back to Tariffville Gorge with three different whitewater events: wildwater, slalom, and freestyle.

Along this reach are remnants of the Spoonville (HELCO) Dam which presently creates a paddling feature usable by only the most expert kayakers familiar with its associated dangers. Efforts are currently under way to raise funds for full dam removal, which will restore the site to natural river flows for fish passage. Removal will likely reveal new river features for paddlers, as well as extend the current Tariffville Gorge rapid. On a final note, Bald eagles winter near this section of the river.

See Figure 34: Scenic Viewshed Analysis for a graphic representation of the scenic potential for exceptional views while paddling the watercourses. In addition, the Farmington River Guide by FRWA provides an in-depth description of paddling opportunities doubling as a field guide to the natural and cultural history of the Farmington River.

Although river users are generally satisfied with conditions along the river, they have noted the presence of litter, a lack of restrooms, and increased development along

the river as problems they would like to see addressed

Walking, hiking, and biking

Several outstanding trail systems are within the study area, including six State of CT officially designated greenways: the Farmington River Trail, the Farmington Canal Heritage Greenway, the Metacomet Ridge System, the Blue Blazed Trail system, the Shade Swamp Sanctuary and the West Mountain Trails in Simsbury. The Salmon Brook system was the most recently designated greenway to be officially included by the State of CT (see Figure 33: Greenways and Access Points).

The Farmington Canal Heritage Trail and the Farmington River Trail are two popular multi-use “Rails-to-Trails” paths which pass through seven of the ten study towns (Burlington, Canton, Farmington, Avon, Simsbury, East Granby, and Granby). The Farmington Canal Heritage Trail has been designated a Community Millennium Trail under the Federal Millennium Trails Initiative based on its special value to the communities it passes through. It forms part of the East Coast Greenway, which, when completed, will stretch from Florida to Maine. (An eighth town in the study, Bloomfield, is beginning work on its section of the East Coast Greenway, and is considering a route within the Farmington River corridor to “connect up” with neighboring study towns.) The Farmington River Trail is an eighteen-mile loop trail that links to the Heritage Trail at points in Farmington and Simsbury. For roughly half its length the trail runs directly alongside the river. Since both trails are built along abandoned rail corridors and canal towpaths, each passes through a rich cultural landscape of historic buildings, canal locks, iron bridges, stone arches, and other landmarks.

Additionally, the ridgelines and parks within the focal watershed and corridors offer a multitude of hiking and walking options. One of the most notable is the Metacomet Trail, part of the MMM (Metacomet Monadnock Mattabassett) Trail system, designated as the “New England National Scenic Trail” in March of 2009. This outstanding trail follows the traprock ridges in Connecticut from the Long Island Sound at Guilford through Massachusetts to the New Hampshire border passing through 5 of the 10 Study Towns

(Farmington, Avon, Simsbury, East Granby, and Bloomfield). Another easily accessible place to hike or walk is McLean Game Refuge in Granby, Simsbury and Canton. The West Branch of Salmon Brook flows through the refuge, which consists of more than 4,200 acres of forests, hills, and streams and includes the easternmost trap rock ridge summit of the Barndoor Hills.

The state, towns, and regional and local organizations have met with success in efforts to expand and link the network of trails and greenways in the Study Area, further increasing their recreational and environmental value (see Figure 33: Open Space/Parks/Recreational Properties).

Fishing

Fishing on the lower Farmington River has long been part of the Cultural Landscape. Early fishing on the lower Farmington River reflected a culture that specialized in subsistence hunting. The Massaco Indians harvested salmon navigating the ledge-rock staircase falls at what is now the Collinsville factory site. Artifacts found at the Indian Hill

archaeological site, located in Bloomfield on a terrace west of a series of rapids at the Tariffville Gorge, indicate that prehistoric Native Americans regularly used this location for fishing as well.

Today, local residents continue to enjoy fishing along the lower Farmington, which possesses a diversity of fishing options and habitats, which all benefit from excellent water quality. The section of the river between Collinsville and Unionville is especially popular with local anglers. It is designated as “no-kill” after the fishing season closes, resulting in the potential for more fish to “catch and release” for the recreational angler.

Tunxis Mead in Farmington offers a different type of recreational fishing. Excavation of sand and gravel from the glacial deposits has created a pond-like environment. This section of the river offers a warm-water fishery, as well as ice-fishing in the winter.

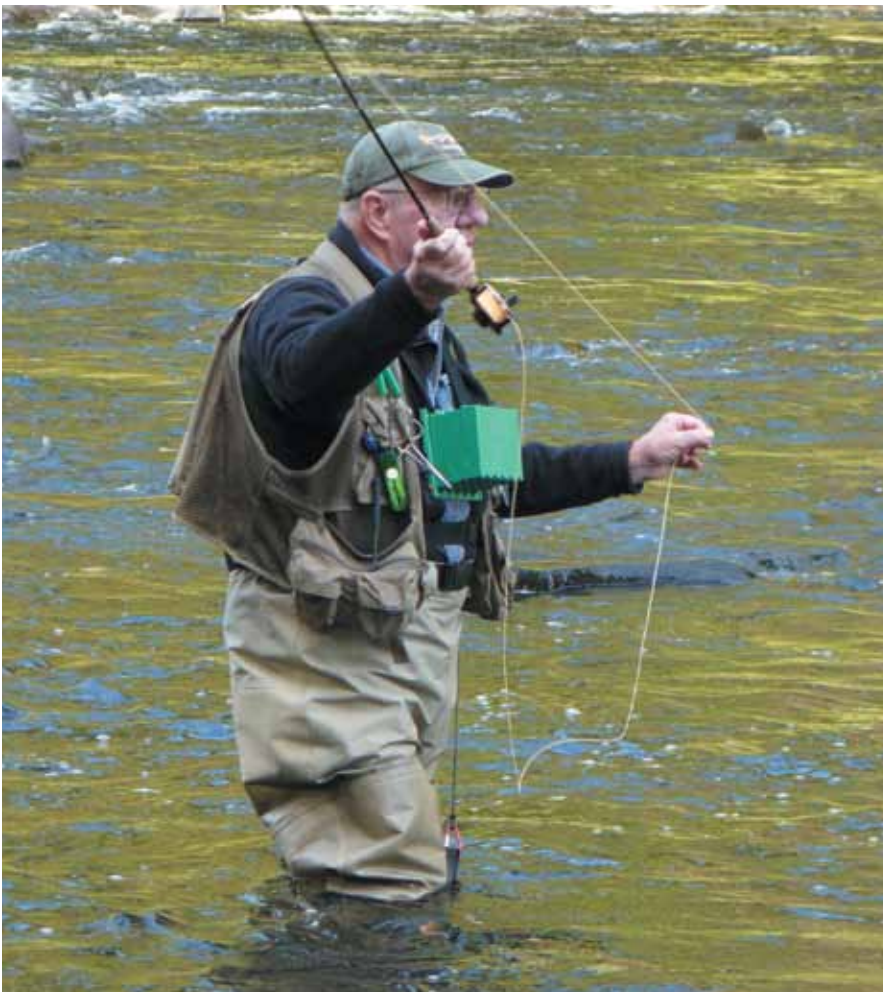
There are numerous access points for fishing within the study area, including three handicapped access sites (Farmington Land Trust near Unionville, Rte 4 Bridge project in Farmington, Rte 20 Bridge in Granby on the East Branch Salmon Brook).

Of particular note are the little known fishing opportunities of the Salmon Brook. Bill Vincent, a Granby angler for 40 years who has fished all over North America and intensively throughout New England describes the Salmon Brook as one of the best streams he has ever fished. There is an abundance of native brown and brook trout and very few warm water species. Trout thrive in cold water environments, and Salmon Brook offers vegetated riparian buffers that provide plentiful shade, preventing the water from experiencing excessive warming. Additionally, the gravel and sand bottom in the brook offers ideal spawning habitat, while an outstanding macroinvertebrate population provides a high quality trout diet. Finally, the high water quality of the tributaries and of the sources contributes to the ideal trout habitat and helps create the opportunity for an exceptional fishing experience.

Birding

Birding is the fastest growing outdoor recreational activity in America, and the river corridor presents exceptional opportunities for this activity. The Study Area is the best and

Farmington River angler
Photo: Sal DiCarl



Ice fishing Photo: Tom Cameron



most varied bird habitat in Connecticut for two main reasons: 1.) the state overlaps the southern boundary of many northern species and the northern boundary of many southern species, so species abundance is unusually high, and 2.) the river corridor provides good nesting habitat and is a migration corridor within the Atlantic flyway.

As a result, exceptional birding areas are abundant in the study area, including:

- Northwest Park in Windsor, which is designated an Important Bird Area (IBA) by the National Audubon Society. A variety of upland, grassland and wetlands species are found within the Park. Over 60-acres of grasslands are managed for the Grasshopper Sparrow, a Species of Special Concern in Connecticut.
- The Nod Brook Wildlife Management Area, a tremendous place to view spring and fall migrations of hawks, including nighthawks.
- The 2.2 mile River Walk in Simsbury, which provides easy viewing access to migratory and nesting waterfowl, including a great blue heron rookery.
- The Farmington Canal Heritage Trail and Farmington River Trail (mentioned above), both of which provide easy access for viewing birds, including migratory waterfowl.
- Fisher Meadow in Avon, a destination for local birders.
- Tunxis Mead/Farmington Meadows in Farmington, which provides excellent birding during migration and in the summer, with varied habitats of meadow, cropland, maple swamp and edge thickets.¹
- The McLean Game Refuge in Granby and Simsbury, a 4,200 acre preserve that is a frequent location of Hartford Audubon Society birding trips.)
- Windsor Meadows State Park at the mouth of the Farmington River, where it flows into the Connecticut River. This Park is at the edge of the study area, on the shore opposite Station 43 in South Windsor, Connecticut, and is regarded as one of the premier birding location in north-central Connecticut.¹

The wide variety of birds found within the

Study Area is discussed in greater detail in the Biodiversity section of this document, along with the results of a recently conducted bird survey done at various points along the river corridor that resulted in sightings of 105 bird species.

Other recreational activities associated with the lower Farmington River and Salmon Brook include watching other wildlife, photography, painting, drawing, hang gliding, dog field trials, ice fishing and rowing (high school teams and local rowing association). The river corridor is also a place for quiet reflection. The wide range of recreational pursuits surrounding the Farmington River and Salmon is truly diverse and exceptional.

There are a number of local organizations that advocate for recreational use of local resources. These include the Tariffville Village Association of the Tariffville section of Simsbury that has made great strides in linking recreational, cultural and historical aspects of their river segment to economic development. For example, they have been instrumental in reestablishing the whitewater races in the Tariffville Gorge. In addition, the Farmington Valley Visitors Association (FVVA) promotes six Study Area towns including Avon, Canton, East Granby, Farmington, Granby and Simsbury to residents and visitors, with an emphasis on the valley's rich culture, history, business and recreation in and around the Farmington River. To enhance economic vitality, FVVA provides seasonal getaway packages, historic barn tours, awareness and opportunities to experience the Farmington Canal Heritage Trail, the Farmington River Trail and the Farmington River.

Recreation Protection Goal

Facilitate public recreation on and along the lower Farmington River and Salmon Brook in a manner consistent with natural and cultural resource protection.

Threats to Recreation

The most obvious challenge to recreation is lack of public access to the waters of the Farmington River and of Salmon Brook and to land within the corridor area. "Access" can be viewed simply as physical access to the waters and land, or seen more broadly to also include public knowledge about access points and recreational opportunities. Existing

¹ *Connecticut Birding Guide*, Buzz Devine and Dwight G. Smith, Thomson-Shore, Inc., 1996

The wide range of recreational pursuits surrounding the Farmington River and Salmon Brook is truly diverse and exceptional.

protections and gaps with respect to this broader notion of public access will be discussed below.

Another significant threat is the potential for water pollution (see also Water Quality section). Possible examples include:

- Pollution that could result in restrictions on fishing, swimming, or boating.
- High levels of bacteria from non-point source pollution runoff.
- Waste water treatment plant failures or overflows.
- Contaminants that reduce water quality, impacting fish populations.
- Contaminants that negatively impact bird populations.

Other potential threats include:

- Diversions and impoundments.
- Fluctuating releases from dams.
- Bank erosion at official and unofficial access points.

Current Protections

To determine the existing level of protection for recreation, and the potential need for additional protection measures at the local, state and federal level, a comprehensive review of all applicable regulations within the study area was undertaken. In all ten towns there is limited local regulatory protection directly related to recreation. In general, local regulations permit limited recreational use within the Floodplain or, in Hartland and Canton, within the Farmington River Protection Overlay. However, four of the ten towns' floodplains regulations do not mention recreational use in this context.

Public Access

Existing protection for public access to the streams and land within their corridors is provided by public parks. Each river town provides recreational public access to the lower Farmington and Salmon Brook. There is a description of some of those access points within the Recreation Appendix (also see Figure 32: Open Space/Parks/ Recreation Properties).

Trail networks are managed through a variety of public and private arrangements. One example of this is the planned stewardship of the recently designated New England National Scenic Trail. The Trail passes through 5 of the 10 study towns, and within the river corridor in 2 of the towns (Bloomfield and East Granby). The National Park Service (NPS), Connecticut Forest and Park Association (CFPA) in Connecticut, and the Berkshire Chapter of the Appalachian Mountain Club (AMC) in Massachusetts are working together to manage the trail. The primary role of the NPS is to assist the CFPA and AMC in their stewardship role, and to coordinate the expenditure of federal funds for trail management and protection with the Stewardship Council. The entire trail system is predominantly managed and maintained by volunteers, and it relies in many locations on the generosity and commitment of landowners who voluntarily allow it to cross their lands.² This model of access to both public and private lands demonstrates the regional commitment to providing for recreational land use. Questions and concerns regarding trail maintenance in Connecticut should be directed to the CFPA.

The Farmington Canal Heritage Trail and Farmington River Trail likewise benefit from public-private partnerships. Five towns in the study area administer the sections of the trails that pass within their borders. Several non-profit organizations (including the Farmington Valley Trails Council (FVTC), Farmington Valley Visitors Association (FVVA), and Simsbury Main Street Partnership) have supported the Trails by funding the actual building of the trails and trail enhancements such as kiosks, signage, benches and landscaping. Enthusiastic public support for the Trails was evident at the September 20, 2009 dedication ceremony of the latest trail enhancement—a new bridge crossing Salmon Brook in East Granby. An excellent trail guide was also recently published by the FVTC utilizing funding from multiple private, state and federal sources.³

Protections also exist within the corridor via Land Trust and Private Conservation Group holdings. Some of these groups promote public use of their land holdings.

2 National New England Scenic Trail website (<http://newenglandnst.org/>)

3 Farmington Canal Heritage Trail & Farmington River Trail Guide, Farmington Valley Trails Council

Gaps in Recreation Protection

- Lack of regulatory and legal protections.
- Lack of funding (at Federal, State, Local, Private levels).
- Reliance on volunteers for stewardship activities.

The Economic Study indicated that owners of local business near close to the river feel that there should be more emphasis on promoting tourism, providing information on recreational opportunities, creating more river access for canoes and kayaks and fostering efforts to keep the river clean.

Recreation Management Priorities

1. Partner with towns and NGOs to maintain and improve access to recreational activities in a way that is compatible with river protection.
2. Provide information on recreation resources and promote area tourism.
3. Conduct a follow up economic study focusing more specifically on the economic impacts of the Tariffville Gorge area.
4. Conduct a User Capacity Study to determine how different types of recreational use can continue to be compatible with each other and with river protection.
5. Promote volunteer opportunities for river stewardship such as river cleanups.

Actions, Tools & Strategies

- Provide and enhance river access and facilitate public-private partnerships that provide river access that is compatible with river protection.
- Support state legislation to protect municipalities from suits such as the MDC faced after a bicyclist was injured on MDC property which was open to public recreation. Enactment of a recreational liability statute would afford liability protection for municipalities and municipal entities like the MDC.

- Provide information on recreation resources (i.e. paddling, greenways, birding, hiking) to encourage local use and tourism. Explore the potential for developing water trails that link recreation to educating the public about the ORVs. Support and partner with existing groups such as paddling organizations, anglers' organizations, greenway and trail associations and land trusts.
- Promote sound waste management strategies through clean-ups, portable toilets, education and regular housekeeping at recreation sites.
- Provide education on safe, responsible recreation use by publishing a Safety and Etiquette guide. This could include information on water quality safety as well as typical paddling guidelines.
- Promote area tourism by supporting the connection of the river corridor with the Connecticut-designated Greenways and New England National Scenic Trail.
- Promote volunteer opportunities for river stewardship such as river cleanups.
- Conduct a follow up recreational use and economic importance study focusing more specifically on the economic impacts of the Tariffville Gorge.
- Conduct a User Capacity Study to augment the *Use and Economic Importance Study of the Lower Farmington River and Salmon Brook* conducted during the Study.
- Make use of the "Suggested Recreation Projects for Member Towns" list provided in the Appendices for recreation-related project ideas. This list was developed with input from the towns and may be a source of ideas for the committee to pursue.



Photo: Tom Cameron

CHAPTER 5

Wild and Scenic Rivers Act Protections

Legislative Guidance

The Wild and Scenic Rivers Act (P.L. 90-542, as amended) provides the legal foundation and overall guidance for the National Wild and Scenic Rivers System. The following sections of the Act describe provisions for the Wild and Scenic Study process and the protective management provided by statute for congressionally designated rivers.

...provides protection to designated rivers from potentially adverse federally assisted water resource development projects...

Section 1(b) summarizes the intent of the Act:

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

This section establishes overall federal policy to be implemented through the Wild and Scenic River designation and also applicable to all federal agencies that might undertake activities that could impact the designated river. The National Park Service, in consultation with the Wild and Scenic Committee, will seek to ensure that this policy is recognized and respected by all federal agencies, and that federal actions are consistent with the intent of the designation and Management Plan.

Section 7 provides protection to designated rivers from potentially adverse federally assisted water resource development projects

and prohibits federal licenses for construction of new hydroelectric development:

The Federal Power Commission shall not license the construction of any dam, water conduit, reservoir, powerhouse, transmission line, or other project works under the Federal Power Act ... on or directly affecting any river which is designated. ... and no department or agency of the United States shall assist by loan, grant, license, or otherwise in the construction of any water resources project that would have a direct and adverse effect on the values for which such river was established. ... No department or agency of the United States shall recommend authorization of any water resources project that would have a direct and adverse effect on the values for which such river was established. ...

The National Park Service will review any proposed federally assisted water resource development project for consistency in protecting and enhancing the values for which the Lower Farmington River and Salmon Brook are designated as a component of the Wild and Scenic Rivers System.

The NPS accomplishes this review through existing regulatory schemes, such as federal

There are no new permits associated with the designation.

permitting under the Clean Water Act by the Army Corp of Engineers or EPA, and through the required project review processes for NEPA, under which federal agencies must conduct environmental impact reviews of proposed federal actions. The NPS will coordinate its review with the Wild and Scenic Committee, but cannot cede its review responsibility to the Committee.

There are *no new permits* associated with the designation.

Section 3(d)(1) specifies the requirement for the preparation of a management plan:

...the Federal agency charged with the administration of each component of the National Wild and Scenic Rivers System shall prepare a comprehensive management plan for such river segment to provide for the protection of the river values. The plan shall address resource protection, development of lands and facilities, user capacities, and other management practices necessary or desirable to achieve the purposes of this Act.

The Lower Farmington River and Salmon Brook Management Plan has been developed through the Study process to meet the requirements of the Wild and Scenic Rivers Act, and will serve as the Comprehensive Management Plan for the designation.

In connection to the user capacity requirement included within Section 3(d)(1), user capacity is not believed to be a current threat to the ORVs or recreational experience on the Lower Farmington River or Salmon Brook. A follow-up user capacity study is recommended in this Plan to augment the *Use and Economic Importance Study of the Lower Farmington River and Salmon Brook*, and will be conducted following designation as a method to establish a baseline for assessing any future user capacity issues.

There is no distinct lateral boundary or corridor recommended within this Plan or for the Partnership Wild and Scenic River designation of the lower Farmington River and Salmon Brook. Section 3 of the Act envisions that lateral “boundaries” be established for all designated Wild and Scenic Rivers as a part of the management planning process or as recommended through a study process. However since the study area contains little or no federal lands, and there are no plans for federal acquisition,

the NPS has determined that distinct lateral boundaries serve little purpose and often lead to confusion.

Section 10(a) specifies a management scheme for designated rivers:

Each component of the national wild and scenic rivers system shall be administered in such manner as to protect and enhance the values which caused it to be included in said system without, insofar as is consistent therewith, limiting other uses that do not substantially interfere with public use and enjoyment of these values. In such administration primary emphasis shall be given to protecting its esthetic, scenic, historic, archaeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area.

This section establishes a “protect and enhance” policy for management of designated WSRs. The Lower Farmington and Salmon Brook Management Plan has been specifically researched and written to address this mandate, and the NPS and Wild and Scenic Committee will seek to implement the “protect and enhance” standard through Plan implementation.

Section 6(c) prohibits acquisition or condemnation of lands associated with a designated river if the existing protection mechanisms are adequate to protect the Outstandingly Remarkable Values:

Neither the Secretary of the Interior nor the Secretary of Agriculture may acquire lands by condemnation, for the purpose of including such lands in any national wild, scenic or recreational river area, if such lands are located within any incorporated city, village or borough which has in force and applicable to such lands a duly adopted, valid zoning ordinance that conforms with the purposes of this Act. . .

In the course of the Wild and Scenic Study process it was determined that existing local, state and federal regulations are adequate to protect the resources of the lower Farmington River and Salmon Brook consistent with Section 6(c). Furthermore, this Plan does not envision any federal acquisition of lands associated with the designation. Federal funds appropriated through the NPS may be utilized to support local, NGO or state partners’ acquisition of lands or easements from willing sellers only.



Quiet reflection Photo: Tom Cameron

CHAPTER 6

Education and Outreach Overview

Goal

The outreach and education goal for the Lower Farmington River and Salmon Brook Wild and Scenic Committee is to engage the public including landowners, recreational users, towns and the state in their shared responsibility of stewardship in order to protect and enhance the Outstanding Resource Values of the Lower Farmington River and Salmon Brook. Organizations with existing education and outreach programs will be encouraged to continue and expand their efforts. The Committee's objective will be to support and complement ongoing education and outreach activities, rather than to duplicate them. To that aim, the Committee will help to organize cooperative efforts among its membership and with other organizations.

The Importance and Purpose of Outreach and Education

Outreach and education plays a critical role in achieving the goals of the Management Plan. Because this is an advisory plan, it can only be successful with the voluntary support and engagement of many stakeholders including

landowners, towns and their local land use commissions, state agencies and recreational users. Outreach and education efforts can be effective when the various stakeholders understand why it is important to protect local resources, know what specific actions are

Because this is an advisory plan, it can only be successful with the voluntary support and engagement of many stakeholders including landowners, towns and their local land use commissions, state agencies and recreational users.

needed and recognize the long-term benefits of resource protection.

Actions

The Lower Farmington River and Salmon Brook Wild and Scenic Committee can provide a strong foundation for achieving the Outreach and Education goal by means of the actions discussed below. The following action list will evolve over time as circumstances change. Opportunities to pursue and implement other actions or activities that would be clearly effective in achieving the goal should be strongly encouraged.

Potential Activities

Website

Establish and maintain a website that would include a variety of information relevant to Outreach and Education goals. Examples are background information on the Wild and Scenic Rivers System, an explanation of the Lower Farmington River and Salmon

Brook Wild and Scenic Designation, access to pertinent documents including the Lower Farmington River and Salmon Brook River Management Plan, maps and images and material about volunteer opportunities and funding opportunities. Contact information and related links, such as links to sites with up-to-date information on river protection techniques that have been used successfully in other areas (e.g., the Center for Watershed Protection, EPA, CT DEP websites), should also be included.

ORV Presentations

Develop and distribute information about the Outstanding Resource Values of the Lower Farmington River and Salmon Brook and how the Wild and Scenic Management Plan provides for their long-term protection and management. This could be done through PowerPoint presentations, videos for community television stations, printed materials, photography contests and/or formation of a speaker's bureau to give presentations to local civic service organizations, garden clubs, and similar groups.

Volunteer Opportunities

Continue and expand existing Farmington River Watershed Association and Salmon Brook Watershed Association volunteer opportunities with students, land trusts, local service organizations and other residents. Activities to continue or expand include vernal pool monitoring, water quality monitoring, stream walk surveys, invasive plant removal and river clean ups. Such opportunities are excellent ways to engage members of the local communities in discrete projects that provide an important service to stream protection and a significant sense of investment and accomplishment to the volunteers.

Recreational Opportunities

Work with local organizations such as the Farmington River Watershed Association (FRWA), the Salmon Brook Watershed Association (SBWA), the Farmington River Anglers Association, the Farmington River Club, the Farmington Valley Rowing Club, Holcomb Farm Learning Center, Inc., the Appalachian Mountain Club, local land trusts and other such organizations to provide recreational opportunities for the public to experience the river (e.g., through nature hikes, bird walks and canoe trips).

Photo: Tom Cameron



...bring further public attention to the Outstanding Resource Values and the management challenges of the Farmington River and Salmon Brook.

Information for Riverfront Landowners

Develop and help towns distribute a simple, understandable brochure for riverfront landowners that 1.) summarizes the existing local, state, and federal regulations that may affect them and how those regulations are implemented, and 2.) provides addresses and phone numbers of the appropriate offices or agencies at each level of government. To ensure accurate descriptions of each town's regulations, different brochures should be prepared in consultation and cooperation with the local land use commissions for distribution in each town.

Information on Best Management Practices for Landowners

Provide information and assistance to landowners on techniques to enhance their stewardship of riverfront property. This could include: 1.) identifying sources of information and expertise regarding the management of forest lands, wildlife habitat and wetland vegetation, 2.) organizing workshops and providing follow-up assistance on voluntary land protection techniques, such as conservation easements and deed covenants and 3.) providing information on the use of Best Management Practices to control non-point source pollution, and on funding opportunities to implement demonstration projects using Best Management Practices.

Land Use Commissions

As membership on local Planning and Zoning, Inland Wetlands and Conservation Commissions typically changes, the Lower Farmington River and Salmon Brook Wild and Scenic Committee will need to establish regular communications with the land use commissions in each town, sharing with them updates on Management Plan implementation, new resource management strategies and the status of Outstanding Resource Value quality. The Wild and Scenic Committee should provide towns with existing publications for distribution to land owners, developers, local land use boards and other relevant people about the causes of non-point source pollution, its potential impacts on water quality and other instream resources, and methods for reducing or eliminating it. The Committee should also provide land use commissions with information on river protection techniques that have been used successfully in other areas.

Periodic Newsletters/Publications

Publish a brief newsletter on a semi-annual basis to provide information on the Outstanding Resource Values of the Lower Farmington River and Salmon Brook, to keep all stakeholders informed of committee activities and report on the current water quality and other conditions of the Lower Farmington River and Salmon Brook. Publish other brochures or informational booklets as necessary to promote key management issues or unique natural, cultural or recreational aspects of the watershed.

Workshops/Training/Professional Development Opportunities

Offer and fund periodic educational workshops and/or training sessions to the public to promote the Outstanding Resource Values and actions that can be taken to address key watercourse management issues such as riparian corridor management and preventing polluted stormwater runoff. Help organize and fund workshops for town staff and commission members to facilitate the updating of town regulations. Provide scholarship assistance for professional development for the staff of non-profits organizations involved with protection of the Outstanding Resource Values. Offer a scholarship to high school or college students from the Study Towns interested in pursuing a career in environmental studies.

Local Schools

Engage local primary and secondary schools with place-based multi-disciplinary opportunities to promote the resources of the Farmington River and Salmon Brook. Activities might include educational programs in the classroom, volunteer opportunities such as aquatic insect sampling and salmon reintroduction or literature and art projects that use the Farmington River and Salmon Brook and its resources as subject matter. Promote river-related activities in local schools, as well as with local service organizations and other groups. Promote and facilitate the use of existing programs such as Salmon in the Classroom, the FRWA watershed curriculum, local Nature Center programs, etc.

Annual Protection Progress Reports

Provide an annual report to all stakeholders, including riverfront landowners, local chief

elected officials, land use commissions and state and congressional representatives reporting on achievements for the year and the status of protection efforts. Identify and recognize each town's activities to implement the Management Plan's recommendations in this report. Recognize outstanding conservation achievements by individuals and groups in the Lower Farmington River and Salmon Brook.

Publicity/Media

Work with FRWA and SBWA to maintain an up-to-date database of media contact information to promote various workshops, training and volunteer opportunities. Release the Annual Protection Progress Report to the media to bring further public attention to the Outstanding Resource Values and the management challenges of the Farmington River and Salmon Brook.

Information Centers

Develop informational exhibits on issues pertaining to the Lower Farmington River and Salmon Brook Outstanding Resource Values that can be displayed at public facilities such as nature centers, libraries, town halls and trail kiosks to increase public awareness.

River Keeper

Explore the possibility of funding a river keeper program, working with the FRWA and SBWA to oversee the general health of the Wild and Scenic portions of the Farmington River (upper and lower) and Salmon Brook.



Photo: Tom Cameron

CHAPTER 7

The Role of Land Trusts in Integration of Land Protection Goals

Every municipality within the study area has an independent land trust organization established as 501(c)3 non-profit charity. The primary purpose of each land trust is to work on a voluntary basis with local landowners to protect the places people care about in their communities. Land trusts do prioritize kinds of properties they would like to preserve, and often base their decisions on the scenic, ecological or agricultural value of potential parcels. To date nearly 6,000 acres of land have been voluntarily conserved in perpetuity and are being held and managed by the local land trusts in eight of the 10-town study area towns. In Windsor and Hartland, the land trusts are start-up organizations. At the time of the Study Committee's survey they did not own any property or conservation easements.



Land Trusts of the ten town study area

Land conservation is becoming more complex every day. Successful land trust efforts today require the ability to navigate complex real estate and financial transactions, raise adequate funds to conserve priority lands, manage and steward hundreds, if not thousands, of acres of land for perpetuity and ensure their organizations are running in a legally, technically and ethically sound manner.

As a part of the Wild and Scenic Study each land trust was requested to complete a survey in order to allow FSWS to better understand their organizational and conservation priorities as well as their needs and challenges. While it was clear land trusts are focused on preserving scenic beauty, recreational

and natural resources, they also expressed a need for greater overall organizational capacity especially around the issues of land stewardship and membership/volunteer recruitment. Most land trusts also expressed an interest in partnering with other land trusts, as well as local, state and federal governments. Some of the land trusts have been more successful at this than others. Partnerships range from substantial help with acquisitions by means of local, state and federal funds to smaller scale assistance to land trusts through their use of WHIP grants and FRCC dedicated Land Protection Program grants for stewardship projects. Additionally, all the land trusts need increased funding both for acquisition of land and for stewardship.

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In four of the five Outstanding Resource Values (Geology, Water Quality, Biological Diversity and Recreation) discussed in this Management Plan for the lower Farmington River and Salmon Brook systems, open space conservation was mentioned as a possible tool for protecting the resources. Local land trusts can potentially play a key partnership role in facilitating land conservation efforts through their status as locally based organizations that can be effective working with landowners, local towns, state and federal governments and others who are interested in conserving land with important resource values. It is very common for local land trusts to partner with town commissions on identifying conservation priorities and cooperatively pursuing specific opportunities. Additionally, land trusts have been important partners with USDA's Natural Resource Conservation Service in working to protect and steward important agricultural lands in the region.

To help ensure that the region has land trusts that are effective in participating in the protection of the lower Farmington River and Salmon Brook's Outstanding Resource Values, and have the sustainable capacity to care in perpetuity for the lands and resources they protect, they should be considered key partners in implementing portions of this plan. Specific actions to undertake to support their partnership could include potentially a combination of providing training opportunities, funding and/or direct coaching/mentoring that will give land trusts the ability to expand their skills and abilities. Areas that are probably within the capability of FSWS that may be considered for support to advance land trusts abilities as partners in implementation of this plan include:

- **Working with Land Trusts on Strategic Land Protection:** Help land trusts to identify and pursue high quality voluntary land conservation projects that advance the protection of the region's Outstanding Resource Values including a potential land protection program to conserve land that furthers the goals of FSWS.

- **Working with Land Trusts on Land Stewardship:** Improve the land trusts' ability to steward and defend their conserved lands and related Outstanding Resource Values through hands-on assistance and through providing information on grants and other sources of stewardship funding.
- **Providing Assistance to Land Trusts in Their Community Outreach and Support Efforts:** To assure broad public support for the land trusts and their work and to increase involvement of the community in the programs and operations of the land trusts, work with local land trusts and FRWA to help publicize land trusts' projects, needs and the benefits land trusts bring to communities.
- **Fostering Land Trust Collaborations:** To enhance river protection by increasing the pace of land conservation, foster and support collaborative work of land trusts, other land conservation organizations and the lower Farmington River and Salmon Brook Wild and Scenic partners.

At this time there is no mechanism in place for the corridor town land trusts to appoint a land trust representative to the FSWS Committee, so there is not a position on the core committee that is solely for a land trust representative. However, it is very important to have land trust input and participation in implementing the Management Plan. The FSWS Committee will work with the land trust community to find the best way to communicate and collaborate on areas of common interest in land and water protection. The fact that land trusts are not represented on FSWS at this time is not intended to permanently exclude them: if an effective mechanism for having land trusts be part of the core committee is found, FSWS can change the make-up of the core committee.

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Photo: Tom Cameron

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