

Dear Friend of the Eightmile River Watershed –

You hold in your hands the key to the Eightmile River Watershed's future. This report is the product of over 10 years of collaboration between local citizens, town governments, concerned agencies and local and national conservation organizations. The facts and recommendations in this report are based on the distillation of many hundreds of pages of primary scientific study and data gathering specific to the Eightmile watershed; based on hundreds of hours of public meetings, workshops, and planning work organized by this Committee; and finally and most importantly, based on the votes of support and endorsement by the citizens of East Haddam, Lyme and Salem as well as all of their land use commissioners.

Representing our current understanding of Best Management Practices, ecology, conservation biology, hydrology and a host of other topics, this volume, along with its companion appendices of more detailed reports, is intended to provide a framework for future action and work by the very same entities that collaborated to write it.

The facts and recommendations will change with time and with it this Management Plan must evolve and adapt – but the goal will remain the same: protect the Eightmile. The citizens have asked for it, the Study Committee has provided the framework, and the towns and residents have approved. We now stand in that precarious space between the road to success and the disappointing story of lost initiative.

We must now put this plan to work – we must protect the Eightmile.

*The Eightmile River Wild & Scenic Study Committee
May 23, 2006*

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A BRIEF HISTORY

In the mid 1990's, a broad group of local citizens came together with the goal of protecting the Eightmile River and the intact watershed landscape that surrounded it. They knew it to be a rural watershed with clear and uncontaminated waters, virtually no polluting industry, large areas of untouched natural landscape and a bucolic quality of living that was rapidly disappearing in many areas of the state.

This initial group of local citizens, supported by The Nature Conservancy and the University of Connecticut Cooperative Extension System, recognized that the watershed's exceptional resources could qualify it for Congressional Wild and Scenic Designation. They also sought the Wild and Scenic process as a powerful tool for bringing multiple communities together to shape and implement a collective vision for protection of the watershed. A local campaign by members of town boards, area land trusts, The Nature Conservancy, river-fronting landowners and other residents was undertaken to initiate the Wild and Scenic process. Congressman Rob Simmons and Senator Chris Dodd helped secure authorization and funding from Congress to undertake a Wild & Scenic River Study.

After the Study bill was passed by Congress, a local Wild and Scenic Study Committee was formed. Charged with carrying out the Wild and Scenic Study and developing a river management plan, the Committee's membership included the First Selectman from the communities of Lyme, Salem and East Haddam, representatives of the three area land trusts, representation from a land use commission in each town, the CT River Estuary Regional Planning Agency, the Natural Resource Conservation Service, the Connecticut Department of Environmental Protection, and The Nature Conservancy. National Park Service provided staff support and overall coordination. Sub-committees on management, natural resources, cultural resources and outreach and education helped guide and implement the study process.

Finding that the Eightmile Watershed contained a wealth of outstanding resource values and was both eligible and suitable for Wild and Scenic status, the Study Committee focused on drafting this Watershed Management Plan and the accompanying Study Report which recommends to Congress official Wild and Scenic designation.

Committee members brought a wealth of knowledge and experience in governmental, ecological and organizational processes. These credentials, along with much collaboration with independent researchers, local supporting agencies, professional contractors and the general public helped ensure the study's success.

In late 2005, the Study Committee released the draft Watershed Management Plan and received endorsements from all of the land use commissions and boards of selectmen from the three primary towns within the watershed (East Haddam, Lyme and Salem). In early 2006, each of those towns held a public meeting vote on endorsement of the Management Plan as well as Wild and Scenic designation at which time the endorsements were passed by a wide margin. As this document goes to the presses, the Eightmile Wild and Scenic Study Committee is transitioning to the Coordinating Committee which will be charged with implementing the plan contained in this document.

ACKNOWLEDGEMENTS

This project could not have been completed without the help of many volunteers who dedicated their time and passion for the watershed.

Volunteers with the vernal pool verification effort, CT River Watch volunteers, Ellen Hawes and Markelle Smith, Jennifer Adler and Shawn Walker from Yale; Ralph Lewis who co-authored the geology sections; members of the Eightmile Coalition who did a wonderful job spreading the word, and especially all of the town citizens who participated in town meetings, forums and votes.

Special thanks to the boards and commissions and especially their chairs who were of the utmost help in forming the Plan: East Haddam Planning and Zoning Commission chaired by Harvey Thomas, East Haddam Wetlands Commission chaired by Randy Dill, East Haddam Conservation chaired by John Gibson, Lyme Planning and Zoning Commission chaired by David Tiffany, Lyme Inland Wetlands and Conservation Commission chaired by Paul Armond, Salem Planning and Zoning Commission Chaired by Hugh McKenney, Salem Inland Wetlands and Conservation Commission chaired by George Ziegra. The Boards of Selectmen from the three towns were crucial in gaining support for the Plan.

The town planners dedicated much time to our project: Jim Ventres of East Haddam, Mary Ann Chinatti of Salem and Bernie Gigliotti of Lyme.

We owe a sincere thanks to the East Haddam Land Trust, Salem Land Trust and the Lyme Land Conservation Trust (additional appreciation to LLCT for their administration of our cooperative agreement) and especially the members and donors without which these land trusts would not exist.

The Nature Conservancy deserves a special thank you for its dedicated support of the Eightmile project. The immense contributions of Nathan Frohling to the Management sub-committee and the process as a whole cannot be overstated.

Members of supporting organizations who gave their precious time to support our project included Mike Beauchene, Ernie Pizzuto, Guy Hoffman, Rick Jacobson, Neil Hagstrom, Steve Gephard, Nancy Murry, Ken Metzler of CT Department of Environmental Protection, the Connecticut NEMO team, the CRERPA team, and John Monroe from National Park Service.

The success of this study would not have been possible without the help of the highly qualified and dedicated contracting staff: The Connecticut River Coastal Conservation District played an essential role in assisting with public outreach and GIS map production. We owe our appreciation to Wendy Goodfriend, Paul Woodworth, Ken Geisler, Jane Brawerman and Barbara Davis from that office. Additional contractors included: Bill Moorehead – ecology, rare species and biodiversity, Piotr Parasiewicz, Diana Walden and graduate students – stream flow and hydrology; Lauren Todd and Ethen Carr – cultural landscape study; Jennifer R. Heintz – threat analysis; Dr. Marc Banks and Dr. Lucianne Lavin – assessment of archaeological resources; Seth Lerman of NRCS CT – town regulations review; Daniel Hubbard – public relations; Damon Hearne – post-Kevin study coordination.

A most special thank you to Kevin Case, NPS staff to the Study Committee and primary author of the Plan whose contributions to this project will never be fully recognized. Jamie Fosburgh from the National Park Service Boston office supported Kevin, kept our wheels greased and provided much sage advice also deserves special recognition.

Finally, special thanks to the volunteer members of the Wild and Scenic Study Committee, some of whom have been involved in this protection effort for nearly ten years. Because of their collective energy and enthusiasm the Eightmile River and its watershed will continue to contribute to the future richness, health and beauty for all creatures that call this landscape their home.



Anthony Irving, Study Chair
May 24, 2006

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www.eightmileriver.org

or by sending a request to info@eightmileriver.org

Further information about the National Wild and Scenic system is available at:

www.nps.gov/rivers

Front cover: Devils Hopyard State Park photo courtesy of the Connecticut River Watch Program archives.

Back cover photos clockwise from top:

Hamburg Cove in Lyme courtesy of N. Frohling, water in Hamburg Cove courtesy of UCONN, fall on the Eightmile River courtesy of UCONN.

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Executive Summary

The Eightmile River Watershed is an exceptional natural and cultural resource. The 62 square mile watershed is a rolling forested landscape with over 150 miles of pristine rivers and streams, large areas of unfragmented habitat, an abundant array of rare and diverse wildlife, beautiful vistas, high water quality, unimpeded stream flow and historic features making it a unique example of an intact and functioning watershed ecosystem in Southern New England. The watershed is almost entirely located within the three towns of East Haddam, Lyme and Salem, Connecticut. Designation as a component of the National Wild & Scenic Rivers System is being pursued for the entire watershed area.

This management plan was created as a part of the Eightmile River Wild & Scenic River Study to establish recommended tools and strategies for ensuring this watershed ecosystem is protected and enhanced for generations to come. The plan was developed by the locally-led Eightmile River Wild & Scenic Study Committee with input from town land use commissions, local citizens, the state and other key stakeholders. This plan and Wild & Scenic designation have been formally endorsed by all seven land use commissions in the three towns. In addition, the Connecticut General Assembly unanimously passed and the Governor signed an act supporting Wild & Scenic designation and the Department of Environmental Protection's participation in the implementation of the plan.

The Eightmile River Watershed Management Plan is a non-regulatory document, reflecting a partnership where local, state and federal interests all 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 do not change if Wild & Scenic Designation occurs as there are no federal mandates or new regulatory powers created with a designation.

Implementation of the management plan through Wild and Scenic designation potentially offers a net financial gain for Eightmile towns and local partners. Costs associated with implementing the management plan are to be funded through new annual funding available through designation. In addition, other sources of funding can be more easily leveraged using the "clout" of a designation. If designation is delayed or unsuccessful or if annual funding levels provided by the National Park Service after designation is insufficient, towns have no obligation to expend funds. However, many of the costs associated with implementing the management plan are negligible and towns and partners can elect to go forward with implementation regardless of the status of new funding.

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 Eightmile River Watershed is based on a cooperatively developed plan that is implemented through the cooperation of all river and watershed interests.
- (3) Any land conservation initiatives related to a Wild & Scenic designation will be based solely on voluntary willing seller arrangements.

The National Wild & Scenic Rivers System

The National Wild & Scenic River System was established by Congress in 1968 to protect certain outstanding rivers from the harmful effects of new federal projects such as dams and hydroelectric facilities. Since then over 160 rivers or river segments have been protected nationwide, including six in New England. To be considered a "Wild & Scenic" river it must be free flowing and have at least one outstanding natural, cultural, or recreational value.

Today, a subset of the Wild & Scenic Rivers system called Partnership Rivers is being used effectively to create river protection approaches that bring communities together in protecting and managing local river resources.

- Partnership Wild & Scenic Rivers are a unique subset of nine rivers along the East Coast that share some common management approaches including: no federal ownership of lands; river management through existing local and state authorities; management strategies that are developed and implemented through the locally led study committee and are locally approved prior to designation; responsibilities associated with managing and protecting river resources are shared among all of the partners – local, state, federal, and non-governmental; and volunteerism is a consistent backbone of success.
- The Eightmile River Watershed is being recommended for designation as a Partnership Wild & Scenic River.

Benefits of a Wild & Scenic Designation

A National Wild & Scenic River designation can bring a river system many benefits. Through National Park Service funding and staff support resources could be made available to help all the partners achieve the protection of the watershed's outstanding resource values resulting in:

- Preservation of a clean and plentiful water supply
- Protection of the rural character that defines the local communities
- Robust and diverse plant and animal populations that reflect a healthy ecosystem
- Possible funding support to help towns achieve their open space conservation goals
- Sound scientific information to help local land use commissions perform their functions
- Small grants to help local schools, towns, civic groups, private landowners and others on projects which support the purposes and goals of the plan

In addition, if designation is achieved, the National Park Service is required to review and comment on all projects that are either federally funded or federally permitted to ensure such activities are consistent with the protection and enhancement of the outstanding resource values that made the river eligible for designation.



The Eightmile River Wild & Scenic Study

Recognizing the watershed was a very special place with a host of unique resource values worth preserving, a local campaign was undertaken by town boards, area land trusts, river-fronting landowners and residents requesting Congressman Rob Simmons and Senator Chris Dodd to pursue authorization and funding from Congress to undertake a national Wild & Scenic River Study. The entire Connecticut congressional delegation supported the bill and on November 6, 2001 it was signed into law by President Bush (Public Law No. 107-65).

The study has been conducted by the locally-led Eightmile River Wild & Scenic Study Committee. The Committee's membership includes the First Selectmen from the communities of Lyme, Salem and East Haddam, representatives of the three area land trusts, representation from a land use commission in each town, the CT River Estuary Regional Planning Agency, the Natural Resource Conservation Service, the CT Department of Environmental Protection, and The Nature Conservancy. The National Park Service provides staff support and overall coordination.

The Eightmile River Wild & Scenic Study Committee was responsible for three major tasks: (1) Discover and/or prove what is special about the Eightmile River Watershed; (2) Develop a watershed management plan that will facilitate the protection and enhancement of these special values; and, (3) Demonstrate to Congress that community members, local land use decision makers, the State of Connecticut and other watershed stakeholders support Wild & Scenic designation of the Eightmile River Watershed. A complete study report that summarizes all of the study's findings and recommendations will be published as a separate document, and have a public comment period, at the end of the study process.

A key decision was made early on by the Eightmile River Wild & Scenic Study Committee to pursue a watershed based Wild & Scenic designation. This decision was made in recognizing that of all its many special qualities, the most outstanding is that the Eightmile River Watershed is a rare example in the Northeast of a whole river system that is fully intact. Furthermore, taking a watershed ecosystem approach to conservation recognizes protection and management strategies cannot just consider a single river segment, plant or animal species, or wetland system in isolation from all that is around it. All of these components are interconnected and if any one is disturbed or altered, all of the others can be affected. The watershed ecosystem approach is comprehensive and based on the interconnectedness of all the natural and cultural resources within the watershed.

Outstanding Resource Values

To prove what is special about the Eightmile River Watershed the Study Committee researched and identified six Outstanding Resource Values (ORVs) in the Watershed. To be an ORV the resource must be natural, cultural or recreational in character and convey unique, rare or exemplary qualities on a regional or national scale. Local, regional and state resource professionals determined the six outstanding resource values that make the Eightmile Watershed exceptional include the cultural landscape, geology, water quality, watershed hydrology, unique species and natural communities, and most importantly, the watershed ecosystem. Complete descriptions of these resources and why they are considered outstanding are available in the appendices.

Purpose of the Management Plan

The Eightmile River Watershed Management Plan achieves many purposes. Some key ones include:

1. Providing stakeholders a clear recommendation of how to protect and enhance the watershed's outstanding resource values and the role a Wild & Scenic designation would have in implementing such recommendations.
2. Substantiating to Congress the suitability of the Eightmile River Watershed for designation as shown through the support of the local communities, the state and other stakeholders to be partners in the plan's implementation.
3. Providing strategies to measure the quality of the watershed's outstanding resource values over time.
4. Providing measurable indicators and guidance to future decision-makers about what constitutes sufficient protection if goals for the outstanding resource values are to be met.
5. Establishing management recommendations that rely principally on locally-led and locally implemented strategies. Regardless of achieving a designation, the Plan serves to help all the stakeholders protect the watershed's ORVs.



Members of the Eightmile Study Committee with watershed sign.
Photo courtesy of J. Rozum.

Implementing the Plan

To oversee the implementation of the Plan a non-regulatory advisory committee would be established called the Eightmile River Wild & Scenic Coordinating Committee (ERWSCC). The responsibilities of ERWSCC include: overseeing the implementation of the Eightmile River Watershed Management Plan; monitoring of the outstanding resource values with respect to the degree they are protected, degraded or enhanced during implementation of the plan; addressing river-related issues that arise in the watershed; reviewing and updating the Eightmile River Watershed Management Plan; and preparing periodic status reports on the quality of the watershed and progress in implementing the Plan.

The membership of ERWSCC will include representatives from all key stakeholders including municipalities, landowners, the State, local land trusts, The Nature Conservancy and, if designated, the National Park Service. If designated congressional appropriations may become available to provide funding and staff resources to support the work of ERWSCC. The Committee is encouraged to leverage any potential federal or non-federal funding to maximize the impact of these resources.

The Partners

The Partnership Wild & Scenic Rivers effort is based on a clear understanding of the roles and responsibilities of each partner. The primary partners in the Eightmile River Watershed include landowners, local municipalities, and the state and, if Wild & Scenic designation is achieved, the National Park Service.

- **Landowners** — Landowners are considered key to overall management plan success. While landowners are under no new regulations or mandates as a result of this plan or a Wild & Scenic River designation, it is hoped they will be supportive of land stewardship practices that are consistent with the Plan and the spirit and goals for protecting the watershed's outstanding resource value goals. It is recommended that landowners are represented and actively participate on ERWSCC.
- **Local Municipalities** — The role of each municipality is voluntary and the actions each town may take are solely up to the towns to decide. The plan calls for each town to be an active participant on ERWSCC and in achieving the goals for the watershed's outstanding resource values.
- **State of Connecticut** — Similar to the towns, the state's role is to be an active participant on ERWSCC, working cooperatively with all the partners to implement the management plan.
- **National Park Service (NPS)** — If Wild & Scenic River status is achieved NPS will be an active participant on ERWSCC and coordinate any funding that is authorized by Congress for use in implementing the Management Plan. In addition, as discussed above, NPS would be responsible for reviewing and commenting on all federally funded or federally permitted projects to ensure compatibility with protecting and enhancing the outstanding resource values.

The Management Recommendations – Tier One and Tier Two

In establishing the management recommendations a comprehensive assessment was completed that identified: a protection goal for each outstanding resource value (ORV); the level of existing local, state and federal protection available for each ORV; threats and management issues that could degrade ORV quality; gaps in existing local, state and federal protection and threats/management issues that might lead to long-term impairment of the ORVs; and, recommended tools that could be implemented to achieve adequate protection and enhancement of all the ORVs. The management recommendations are organized into two categories: Tier One and Tier Two.

Tier One – Tier One recommended tools are high priority items that have been identified as important to implement in the short-term to ensure protection of the outstanding resource values. Management partners, including local communities, the state and others are asked to begin the process of implementing Tier One tools within 6-12 months of achieving affirmative votes of support for Wild & Scenic designation at town meetings. As an initial step in pursuing implementation of the Tier One tools, each partner is asked to first establish a timeline and approach for completing implementation.

It is recognized that it is unlikely designation and securing of funds to support designation will be achieved in the 6-12 month timeframe that has been suggested to begin implementation of the Tier One tools. As such it is recommended that the Eightmile River Wild & Scenic Coordinating Committee be established upon dissolution of the Eightmile River Study Committee. This action will not only provide continuity and continued momentum between the end of the study process and formal designation, it will also show Congress the high level of partner commitment to the long-term preservation of the watershed. As there would be no congressional authorization for the National Park Service to participate as a member of ERWSCC prior to designation, the agency's involvement may be limited.

The implementation of some of the Tier One tools will take significant human resources, time and possibly funding to complete. As such, if a designation occurs, it will be the intent of the Eightmile River Wild & Scenic Coordinating Committee and the National Park Service to prioritize any funding or technical resource support on implementation of these items. Management Plan partners, including local communities and the state, while not expected to implement all the recommended tools if a designation does not occur, are strongly encouraged to implement those parts of the plan that can be done without undo stress on human or financial resources.

It is important to note that all the recommendations for local commissions are just that: recommendations. This planning document or the powers of a Wild & Scenic designation can not force a community to adopt them. The actual implementation of these recommendations will require all the formal procedures the commissions must follow, especially in considering and potentially adopting any new regulations, including public notice, public hearings, and commission deliberation prior to making a final determination.

Tier One recommendations include:

1) Riparian Corridor Protection – Riparian corridor lands, those lands adjacent to rivers and streams, are the first line of defense for a river system. Maintaining and protecting these areas in a natural native condition is the most important action that can take place to ensure the long-term quality of river and watershed resources.

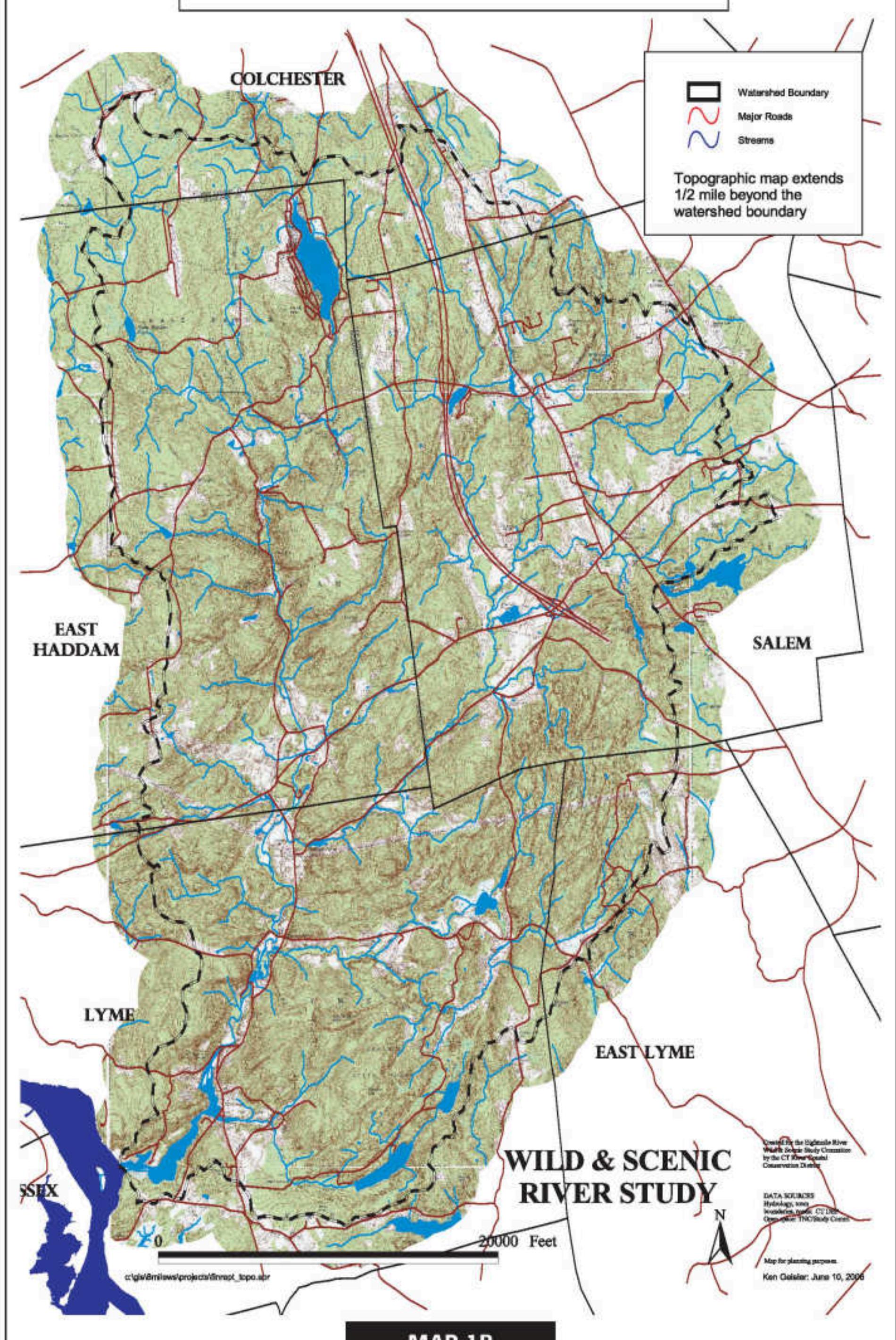
Recommended Action: To protect riparian corridor function adopt a River Protection Overlay Zone for all perennial streams and rivers in the Eightmile River Watershed that provides a 50 foot protection area along small headwater streams, and a 100 foot protection area along larger streams.

Note: The effect of this proposal on property owners is very small. Only 5% of all lands in the watershed would be within the proposed overlay. Of that, 97% of the proposed overlay protection area is already regulated by local Inland Wetlands Commissions as wetlands or are under review by the local Inland Wetlands Commission as an upland review areas. The proposal is sensitive to ensuring landowners are not unduly burdened through its potential implementation. Details of the proposal, its purpose and limitations can be found in **Appendix 9 – Tier One Tools Recommendation Details**.

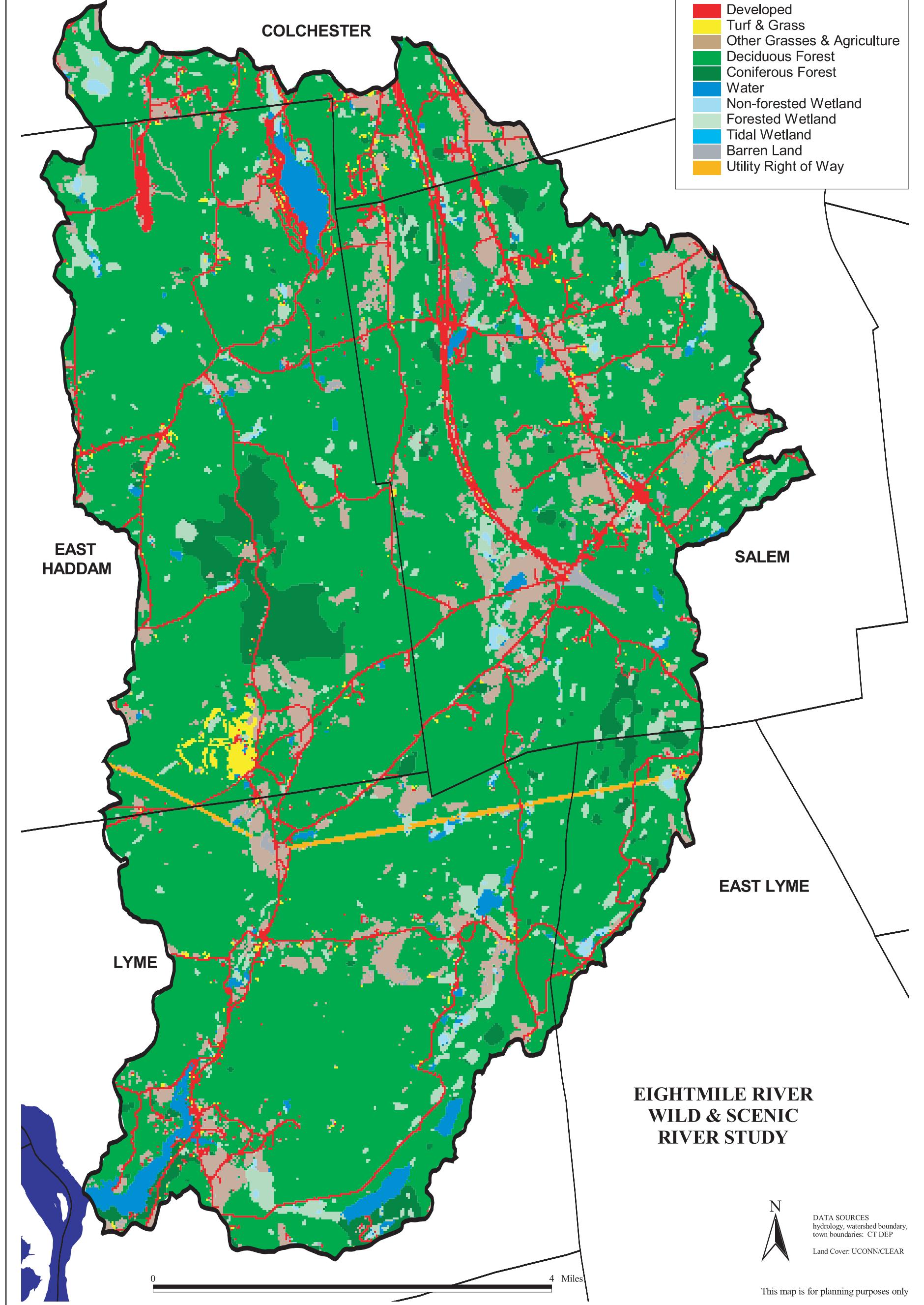
Watercourses in the Eightmile River Watershed



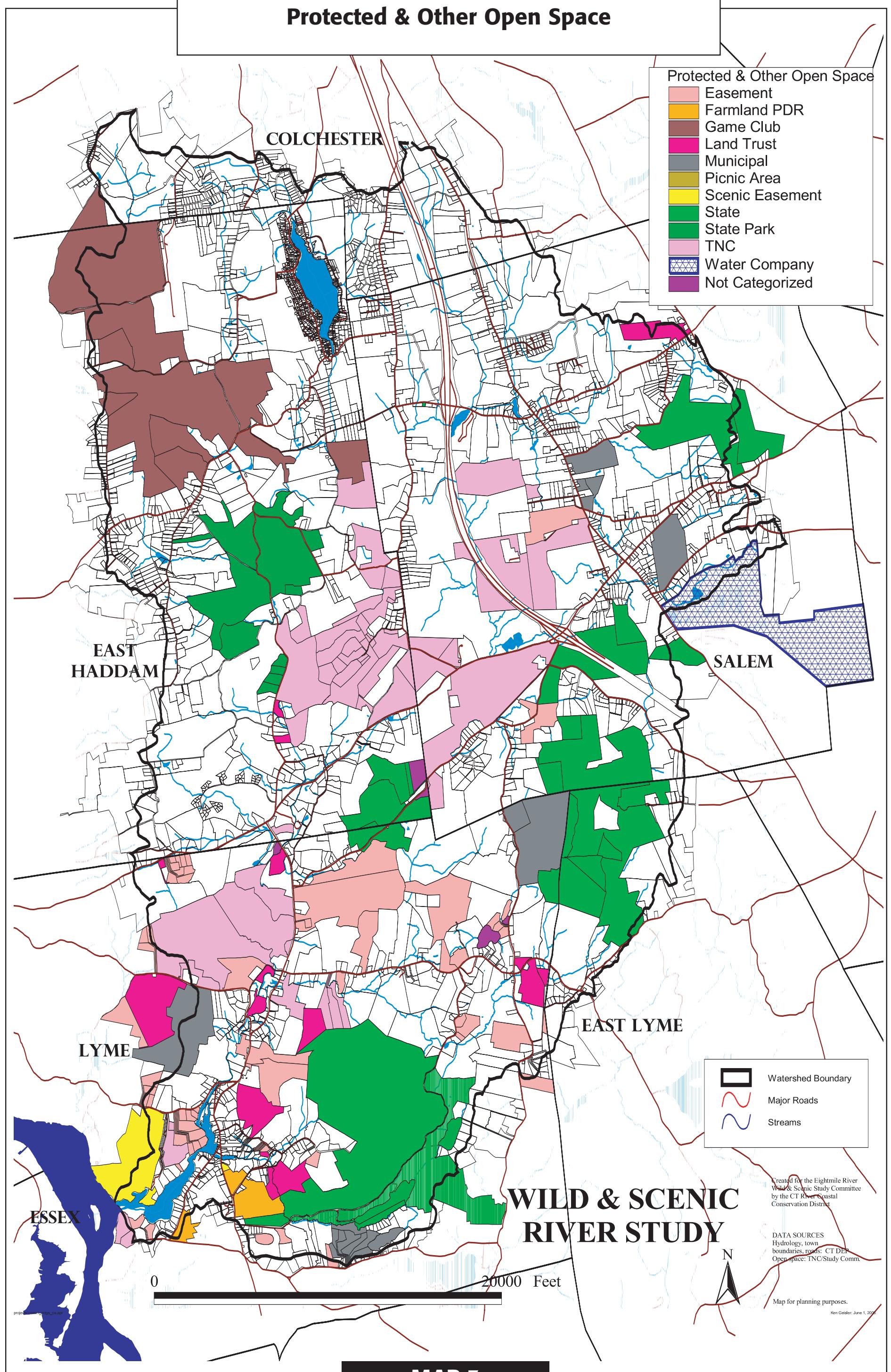
Topographic Map of the Eightmile Watershed



Landcover



Protected & Other Open Space



MAP 3

2) Habitat Fragmentation – Habitat size directly effects species distribution, migration and population size, and is critical for maintaining overall biological diversity and ecosystem functions. Fragmentation of habitat occurs when a large region of habitat has been split into a collection of smaller patches. For example, a forest habitat may become fragmented when a road is built across it splitting it into two smaller disconnected patches.

Fragmentation can cause, among other things: a reduction of total habitat area; vulnerability for species forced to migrate to other habitat patches; the isolation of populations leading to a decline in population size and quality; and edge effects altering habitat, species composition, microclimates, and vulnerability to predation.

Recommended Action: Commit to making protection of important habitat blocks an open space conservation priority, work with partners to identify voluntary land conservation opportunities, and be a partner in pursuing federal funding to support such types of acquisitions.

3) Increases in Impervious Surfaces – Impervious surfaces, including rooftops, parking lots, and roadways can cause significant impacts to overall water quality and watershed hydrology. Impervious surfaces block rainfall from infiltrating into the soil, increasing surface runoff and decreasing groundwater infiltration. Among other things this can lead to reduced groundwater recharge causing a decreased base flow, which in turn can cause streams to become intermittent or dry. Water quality can also be affected as impervious surfaces increase polluted stormwater runoff, impacting variables such as nutrient levels, temperature, bacteria and heavy metals.

Recommended Action: Each community sets a maximum impervious surface goal of 10% for any sub-basin within the local watershed, and 4% for the Eightmile River Watershed as a whole. In addition, each community supports working with the Eightmile River Committee to 1) refine modeling of current and future impervious levels, 2)use the modeling to predict future increases in imperviousness in each town and 3) adopt appropriate tools to address limiting impervious surface increases to meet impervious surface goals.

4) Stormwater Management – Poor stormwater management can affect a host of issues associated with overall watershed quality including impacts to: overall hydrology; stream channel morphology; floodplain function; water quality; habitat; and overall ecological function.

Recommended Action: Three actions have been identified including: (1) Require the design, implementation and maintenance of all new stormwater systems to be consistent with the 2004 CT DEP Stormwater Quality Manual; (2) Complete a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for Small Municipal Stormwater Systems; (3) Adopt the University of Massachusetts guidance for watercourse crossings, an approach that is promoted by the Army Corps of Engineers (New England Region).

Tier Two – Tier Two recommended tools are longer-term actions that partners can take to further protect watershed resources. There are a host of recommendations that if pursued will provide a strong combination of sound science and good stewardship to substantially enhance the long-term protection of the resources. Many of the Tier Two tools recommend establishing additional scientific baseline information and monitoring outstanding resource values. This information is critical to the overall success of the plan and ERWSCC's ability to assess and document the level of protection and enhancement achieved through the plan's implementation. In addition, other important tools include supporting the use of voluntary open space conservation to protect important values and outreach and education initiatives to important target audiences such as landowners, school groups and land use commissions.

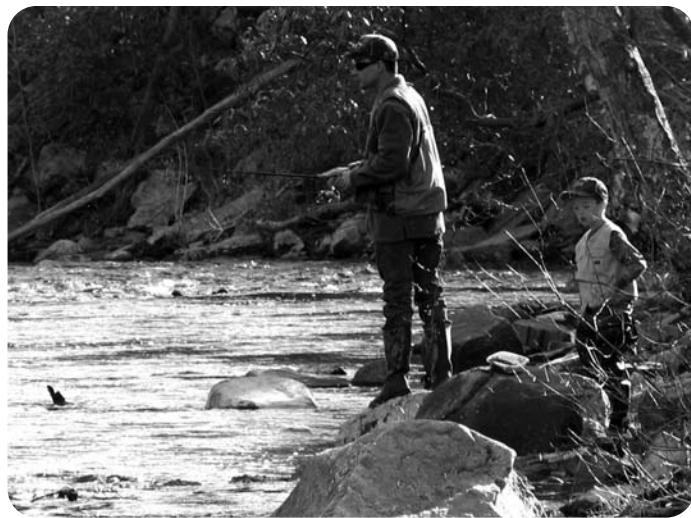
It is highly recommended that towns attempt to pursue these tools in addition to and generally after implementation of the Tier One tools. It is understood and anticipated that it will take 2-5 years or more to implement the majority of the Tier Two tools. Again, this will partially depend on the ability of the ERWSCC to provide support to the partners where and when needed.

Outreach & Education

The goal of outreach and education is to engage the public, including landowners, recreational users, towns and the state to be continually involved and active in protecting and enhancing the outstanding resource values of the Eightmile River Watershed Key actions. These include publish periodic newsletters and other publications, provide annual protection progress reports, establish and maintain a website, offer pertinent workshops and training, provide volunteer opportunities to keep the public engaged, pursue publicity and media coverage when necessary, and engage the local schools in activities that help promote awareness and stewardship of watershed resources.

Summary

Implementation of the Eightmile River Management Plan and achievement of a Wild & Scenic Designation for the Eightmile River Watershed will provide long lasting benefits to all the Eightmile River communities. This partnership approach will support and enhance the quality of life residents of the watershed have come to expect, while ensuring local communities remain in control of their own futures.



Opening day on the Eightmile. Photo courtesy of D. Bingham.



Introduction

The Eightmile River Watershed is an exceptional natural and cultural resource. The 62 square mile watershed is a rolling forested landscape with over 150 miles of pristine rivers and streams, large areas of unfragmented habitat, an abundant array of rare and diverse wildlife, beautiful vistas, high water quality, unimpeded stream flow, and significant cultural features. Most notable is that the overall Eightmile River Watershed ecosystem is healthy and intact throughout virtually all of its range. The watershed is almost entirely located within the three towns of East Haddam, Lyme, and Salem, Connecticut.

The Management Plan Is Locally Led: This management plan was created as a part of the Eightmile River Wild & Scenic River Study to establish recommended tools and strategies for ensuring this watershed ecosystem can be protected and enhanced for generations to come. The plan was developed by the locally-led Eightmile River Wild & Scenic Study Committee with input from town land use commissions, local citizens, the state and other key stakeholders.

The Management Plan Is Locally Implemented: The Eightmile River Watershed Management Plan is a non-regulatory document, reflecting a partnership where local, state and federal interests all voluntarily agree to participate in its implementation and the realization of its purpose and goals. The plan describes a management approach consistent with the original intent of the study effort which was to keep watershed management and protection efforts local. The roles and responsibilities of land use planning and regulatory commissions and agencies do not change if a Wild & Scenic Designation occurs as there are no federal mandates or new regulatory powers created with a designation.

Implementation Costs to Towns Are Negligible: Implementation of the management plan through Wild & Scenic designation potentially offers a net financial gain for Eightmile towns and local partners. Costs associated with implementing the management plan are to be funded through new annual funding available through designation. In addition, other sources of funding can be more easily leveraged using the "clout" of a designation. If designation is delayed, unsuccessful or if annual funding levels provided by the National Park Service after designation are insufficient, towns have no obligation to expend funds. However, many of the costs associated with implementing the management plan are negligible and towns and partners can elect to go forward with implementation regardless of the status of new funding.

Protection Strategies Are Scientifically Driven: This plan relies on scientifically sound recommendations to protect the outstanding resource values identified during the study, including: watershed hydrology, water quality, geology, unique species and natural communities, the cultural landscape and most importantly the watershed ecosystem. Protecting these resources benefits all of us. Ensuring clean drinking water supply, maintaining the area's rural character and scenic qualities, and caring for and enhancing the watershed's plant and animal life all contribute to the high quality of life residents of the watershed communities have to come to expect and appreciate.

This Is Not The Final Study Report: A final study report, with opportunity for public comment, will be produced at the end of the study process. The final Study Report produced by the National Park Service will summarize the study findings and make final recommendations to Congress. In addition, substantial documentation can be found in the appendices that detail the watershed's outstanding resource values and provides substantial analysis regarding the resource management needs for those values that have led to the recommendations found in this plan.



Rural landscape of the Eightmile River Watershed. Photo courtesy of UCONN/NEMO.



Background

THE NATIONAL WILD & SCENIC RIVERS SYSTEM

In order to preserve forever the free-flowing condition of some of the nation's most precious rivers The National Wild & Scenic Rivers System was established in 1968 with the passage of Public Law 90-542 on October 2, 1968. The Act states:

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

To qualify, a river or river segment must be in a free-flowing condition and must be deemed to have one or more "outstandingly remarkable" scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values.

Currently over 160 rivers representing over 11,000 miles of river have been designated Wild & Scenic across the country. The Farmington River is currently Connecticut's only Wild & Scenic River with 14 miles designated in August of 1994.

Over the past 20 years, river conservation interests at the local, state and federal levels have worked in loose collaboration to adapt the National Wild & Scenic Rivers Act into an effective, partnership-based approach to national designations. This unique approach called "Partnership Wild & Scenic Rivers" has been recognized by the National Park Service and the US Congress as a distinct and consistent application of the Wild & Scenic Rivers Act. Partnership Wild & Scenic Rivers, currently consisting of nine rivers, including the Farmington River, are federally designated components of the National Wild & Scenic Rivers System that share the following common principles and management systems:

1. No federal ownership of lands.
2. Administration of the designation and implementation of the Management Plan is accomplished through a broadly participatory "Advisory Council" or "Committee" convened for each river specifically for this purpose.
3. Adjacent land use continues to be governed by local communities and state statutes (as prior to designation).
4. The National Park Service is responsible for implementing Section 7 of the Wild & Scenic Rivers Act, to ensure federal consistency in preserving identified "Outstandingly Remarkable Values." This responsibility is coordinated with each river's Advisory Council/Committee.
5. The River Management Plan is written and implemented through a broad participatory process involving guidance from a locally-based Advisory Council, and is locally approved prior to federal designation (as a part of the feasibility study). The Plan, locally approved and endorsed by relevant state and federal authorities, forms the basis of the designation and post-designation management.
6. The responsibilities associated with managing and protecting river resources are shared among all of the partners - local, state, federal, and non-governmental, and volunteerism is a consistent backbone of success.

In addition, a river designated in the National Wild & Scenic Rivers system qualifies for potential federal funding and technical support for actions and projects that help achieve the goals of the locally created river management plan, in turn enhancing and protecting the river's outstanding values.

Designation also provides communities with special federal protection of the river. Section 7(a) of the Wild & Scenic Rivers Act describes the specific protections provided to designated rivers:

The Federal Power Commission [Federal Energy Regulatory 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...

Designation creates a specific mandate that no federally permitted or funded "water resource development project" shall be allowed that would have a "direct and adverse" impact upon the Outstanding Resource Values that made the river eligible for designation. The National Park Service is charged with ensuring such federal consistency. However, overall river management continues to rely on local control and self-determination and allow existing river uses to continue. Designation does not establish a federal park or locally undesired federal land ownership.

It is important to note designation itself would only effect federally licensed or assisted water resource projects that would impact the river's Outstanding Resource Values. Other types of development would continue to be regulated by local and state land use laws. Designation will not rezone private land or change property rights. Land use controls on private land are solely a matter of state and local jurisdiction. Any changes to local or state zoning regulations stimulated by the designation would only occur through existing procedures at the town or state levels. Wild & Scenic designation also does not give the federal government any authority to infringe on an individual's privacy or property rights.



Chapman Falls from above, Devils Hopyard State Park.
Photo courtesy of N. Frohling.

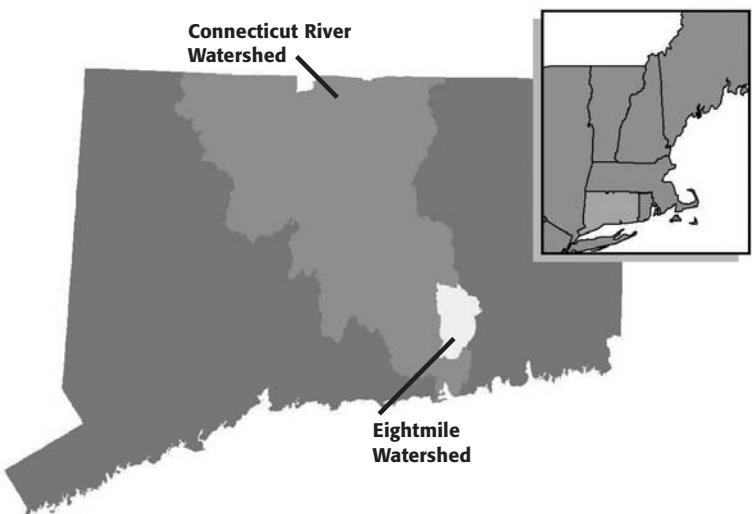
THE BENEFITS OF A WILD & SCENIC RIVER DESIGNATION

With the funding and staff support that will likely come with a designation, the communities of the Eightmile River Watershed could have access to resources that help all partners achieve protection of the watershed's outstanding resource values. Such support can bring a host of positive benefits to all, including:

- **Preservation of a clean water supply for local residents** – The many tools recommended to protect water quality and watershed hydrology in the watershed will have a direct benefit on drinking water supply for residents.
- **Protection of the rural character that defines the local communities** – Opportunities to implement tools that conserve stream banks, voluntarily protect large wildlife habitats and important open space areas, and ensure that river and stream quality remain high will all help keep the rural qualities of local communities intact.
- **Robust and diverse plant and animal populations that reflect a healthy ecosystem** – A key component of the character and quality of the Eightmile River Watershed is the unique plant and animal life that exists. With significant populations of animal and plant species unique to both Connecticut and the region, the watershed can continue to be an important regional repository of near coastal New England biodiversity.
- **Possible funding support to help towns achieve their open space conservation goals** – Designation may leverage opportunities for funding that can help the towns and state achieve their open space conservation goals, saving towns' money.
- **Current, sound scientific information and technical support to help in the decision making process for local land use commissions and their staffs** – This can save commissions and applicants time and money, providing information to make sound defensible decisions based on strong science and technical expertise.
- **Small grants to help local schools, towns, scouts, civic groups, land trusts, private landowners and others with projects that support the purposes and goals of the plan** – Often a portion of Wild & Scenic funding is offered as small grants by the local coordinating committee to support local activities that enhance the outstanding resource values and help build the partnership capacity of the grant recipient.
- **Outreach and education opportunities that enhance an understanding of the watershed and its characteristics that provide a sense of place for local citizens of all ages.** – Publications, programs, workshops and training that promote the resource values and best management practices may be offered to different audiences from school age children, to land use commissions, to local landowners.
- **Financial resources to help towns with certain activities they may have had to otherwise fund on their own.** – For example a town may have a badly eroding stream bank that is threatening a town road. Funding may be available to help the town restore the stream bank and secure the road.
- **Promotes the natural functions of the river and its adjacent floodplains for flood control** – Attenuating flood waters prevents property damage and protects public health. Funding resources through a designation may support opportunities to protect natural stream flow and floodplain functions.
- **Prevents federally funded or permitted projects determined to be adverse to the watershed's outstanding resource values.** – Designation creates a specific mandate that no federally permitted or funded "water resource development project" shall be allowed that would have a "direct and adverse" impact upon the outstanding resource values that made the river eligible for designation.

THE EIGHTMILE RIVER WATERSHED

The Eightmile River Watershed is a mostly undeveloped drainage basin that occupies over 62 square miles of hilly, forested terrain in southeastern Connecticut. The landscape of the watershed is characterized as one of rolling low hills and ridges separated by numerous small, narrow drainage corridors and hollows, and in places broader valleys and basins. A tributary to the Connecticut River, the Eightmile's confluence with the larger river is approximately 8 miles upstream of the mouth of the Connecticut River at Long Island Sound, hence its name.



From the mouth of the Eightmile River upstream 2.4 miles, the river is tidal, primarily a relatively long, narrow, shallow embayment of the Connecticut River known as Hamburg Cove. Beyond the tidally influenced sections, the Eightmile River and its tributaries represent over 150 miles of clear, picturesque forested streams of long, mostly medium to high gradients, punctuated occasionally by shrub-swampy or marshy sections. High elevations across the watershed range from 500-650 ft in the upper northern part of the watershed, to 300-400 ft in the lower southern end of the watershed.

Approximately 90% of the watershed lies in equal portions within the three communities of East Haddam, Lyme and Salem, with the remaining 10% evenly split between Colchester and East Lyme. In 2004 the combined population of the three main communities was 15,228, with 60% located in East Haddam, 27% in Salem and 13% in Lyme. With just 5,400 people living in the watershed itself, population density is very low at 87 people per square mile as compared to the overall statewide average of 700 people per square mile. The low density has contributed to a rural bucolic countryside with scenic views, occasional farm fields and a transportation pattern that hasn't changed substantially since the peak of the local agrarian economy in the mid-19th century.

With nearly 80% forest cover and only 6% developed area, the watershed is made up of large unfragmented blocks of habitat supporting an abundant array of rare and diverse species. Over 150 plant and animal species of high conservation value and nearly 100 significant natural communities are present in the watershed. Robust biological indicators show water quality to be very high with very few current sources of degradation. The watershed's hydrology, from stream flow to groundwater movement is essentially unimpaired with no significant impoundments and little impervious cover impeding groundwater flow. Substantial open space conservation has been achieved in the watershed. Over 28% of the land area, 11,000 acres, is currently permanently protected, including over 5,000 acres of state forest and park land, as well as significant holdings by municipalities, local land trusts and The Nature Conservancy.

THE EIGHTMILE RIVER WILD & SCENIC STUDY PROCESS

A Wild & Scenic River Study is conducted to determine whether a particular river or river segment should be included in the national Wild & Scenic Rivers system. To establish a study of the Eightmile River, letters from town boards, area land trusts, river-fronting landowners and residents were submitted to Congressman Rob Simmons and Senator Chris Dodd requesting that a Wild & Scenic River Study be authorized and funded by Congress. The entire Connecticut Congressional delegation supported the bill, and on November 6, 2001 Public Law No. 107-65 was signed into law by President Bush (see **Appendix 10 – Eightmile River Wild & Scenic Study Act of 2001**).

The river is being studied for possible designation as a Partnership Wild & Scenic River and, as such, the study has been conducted consistent with the principles associated with the Partnership River approach. First and foremost the study has been carried out in partnership with the locally led Eightmile River Wild & Scenic Study Committee. The Committee's membership includes the First Selectman from the communities of Lyme, Salem and East Haddam, representatives of the three area land trusts, representation from a land use commission in each town, the CT River Estuary Regional Planning Agency, the Natural Resource Conservation Service, the CT Department of Environmental Protection, and The Nature Conservancy. The National Park Service has provided staff support and overall coordination.

To complete the study there are three primary components.

- (1) Determining if the river is eligible for inclusion in the Wild & Scenic Rivers system by demonstrating it has outstanding natural, cultural or recreational values of regional or national significance;
- (2) Determining if the river is suitable for Wild & Scenic designation by substantiating local support and commitment to designation through methods such as town wide votes of support for designation, and adoption of locally-based river protection actions; and
- (3) Developing a locally supported river management plan for the watershed that details the strategy for future protection of the area's outstanding values.

Upon completion of all study components a final determination is made by the National Park Service as to whether the river system should be recommended for inclusion in the National Wild & Scenic Rivers System. A complete study report that summarizes all of the study's findings and recommendations will be published as a separate document, and have a public comment period, at the end of the study process. Any actual designation requires that a designation bill be passed by Congress and signed by the President.



Chapman Falls from below, Devils Hopyard State Park.
Photo courtesy of N. Frohling.

THE IMPORTANCE OF A WATERSHED APPROACH TO MANAGEMENT

A key decision was made early on by the Eightmile River Wild & Scenic Study Committee to pursue a watershed based designation for the Eightmile River Watershed.

Going into the study much was already known about the Eightmile River Watershed. Recognized as a key component of one of the 40 Last Great Places in the Western Hemisphere by The Nature Conservancy in 1993, the Eightmile River system is remarkably intact, free-flowing and virtually dam free. With excellent water quality and 80% forest cover, the watershed is a haven for diverse and abundant fish populations, globally rare species, an internationally recognized freshwater tidal marsh, and indicators of outstanding health such as native freshwater mussels.

Between 1995 and 2000 the local communities, working with the University of Connecticut's Cooperative Extension System and The Nature Conservancy, documented many of the natural and cultural features of the Eightmile River Watershed and the management issues facing them.

During the Wild & Scenic study process six distinct outstanding resource values (ORVs) were identified, making the watershed eligible for Wild & Scenic designation (see study step #1 above). The six ORVs include the cultural landscape, geology, water quality, watershed hydrology, unique species, and natural communities and the watershed ecosystem. (Summaries of each ORV can be found in Chapter VI. Full reports on each ORV can be found in Appendices 1 through 6.)

The most distinct and outstanding characteristic to emerge was the watershed ecosystem itself. It is very uncommon to find an entire river ecosystem of this size that is virtually intact throughout its watershed range, particularly in the near-coastal region of Southern New England. It is also clear that the other ORVs are components of – and combine to produce – this outstanding river system and that the long term quality of each of the ORVs is directly connected to the quality of the watershed as a whole.

The Committee recognized the best strategy to protect these special values was to pursue a designation in which the overall management strategy recognized the watershed ecosystem as the driving force behind all of the ORVs.

Taking a watershed approach to management means that protection and management strategies cannot just consider a single river segment, plant or animal species, or wetland system in isolation from all that is around it. All of these components are interconnected and if any one is disturbed or altered, all of the others can be affected. The watershed approach is comprehensive and based on the interconnectedness of all of the natural and cultural resources within the watershed.

The management recommendations in Section VI reflect strategies that recognize that all of the ORVs are connected and that management can only be successful if all of the strategies are implemented together.

PURPOSE OF THE MANAGEMENT PLAN

The Eightmile River Watershed Management Plan, developed in broad collaboration with the local study committee, local land use commissions, community residents, the state and other stakeholders, details the strategy for future protection of the area's outstanding values.

As the entire Eightmile River Watershed is being pursued for designation as a component of the National Wild & Scenic Rivers System this plan and the purposes, goals and recommended tools that it describes are intended to protect the resources within the Eightmile River Watershed and not necessarily for the parts of the communities outside the watershed. However, a great majority of the recommended tools could easily have town-wide application if the towns so wished.

Completion of the Plan during the study process achieves a number of objectives:

1. Provides stakeholders with clear recommendations of how to protect and enhance the watershed's outstanding resource values, and describes the role a Wild & Scenic designation would have in implementing such recommendations.
2. Town citizens, local land use commissions and the state are all asked to endorse the management plan and commit to participate in its implementation. Endorsement of the Management Plan by all key stakeholders substantiates to Congress the suitability of the Eightmile River Watershed for designation, as shown through the support of the local communities, the state and other stakeholders.
3. The Watershed Management Plan provides a blueprint for how all parties can proceed to ensure the long-term protection of the outstanding resource values of the Eightmile River Watershed. It also identifies strategies to measure the quality of the watershed's ORVs over time. Indicators are provided that typically give quantifiable approaches to determine how well the outstanding resource values are being protected and enhanced. The Study Committee recommends NPS use the management plan's indicators to measure potential impacts to the ORVs when performing reviews of federally funded or permitted projects to ensure proposed activities are consistent with protecting the watershed's outstanding resource values.
4. The Eightmile River Watershed Management Plan will serve as the Comprehensive Management Plan required of all congressionally designated Wild & Scenic Rivers.
5. The Plan will establish the basis for federal technical and financial assistance if the Eightmile River Watershed is designated as a component of the National Wild & Scenic Rivers System.
6. The management tools recommended in the plan rely principally on locally-led and locally implemented strategies, and as such the Plan can be used to help all stakeholders protect the watershed's ORVs regardless of achieving a designation.



Eightmile River below Moulsons Pond. Photo courtesy of N. Frohling.



Management Plan Development, Philosophy and Implementation

GOALS AND PRINCIPLES

Section 10(a) of the Wild & Scenic Rivers Act specifies how designated rivers should be managed:

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. 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.

Development of The Eightmile River Watershed Management Plan was led by the Management Plan Subcommittee of the Eightmile River Wild & Scenic Study Committee. The Management Plan Subcommittee's goal was to preserve the resources of the Eightmile River Watershed and support achievement of Wild & Scenic designation by developing a management plan that is guided by three fundamental principles:

- (1) Resource Conservation and protection should be fully integrated with traditional patterns of use, ownership, and jurisdiction, relying on existing authorities.
- (2) Management of the Eightmile River Watershed should be based on a cooperatively developed plan that establishes resource protection standards and identifies key actions accomplished through cooperation among all public and private organizations with an interest in the river.
- (3) Any land conservation initiatives related to a Wild & Scenic designation will be based solely on voluntary willing seller arrangements. There will be no acquisition of lands through federal condemnation in conjunction with a Wild & Scenic River designation.



Lyme Community Meeting January 2003. Photo courtesy of L. Bireley.

In addition to these principles it is the intention of the Eightmile River Management Plan Subcommittee that the Eightmile River Watershed Management Plan be implemented in an adaptive manner, allowing for the continual improvement of management policies and practices by learning from previous efforts.

DEVELOPING THE MANAGEMENT PLAN

Development of the Eightmile River Watershed Management Plan involved the seven steps summarized below, as well as an outreach component to collect input and comment on the development of the plan as it progressed. The seven planning steps included:

- (1) **Set Protection Goals for Each Outstanding Resource Value** – Identified the desired levels of local, state and federal protection for each outstanding resource value that meets (a) the requirements of Section 6(c) of the Wild & Scenic Rivers Act, and (b) any additional protection goals deemed appropriate by the subcommittee.
- (2) **Identify Indicators for each Outstanding Resource Value.** Indicators are the primary characteristics that describe the ORVs (in terms of either important features or processes that define or affect the ORV). Indicators are also important for being able to monitor the quality and long-term viability of the ORV. For example, the amount of impervious surface is one indicator for "Water Quality."
- (3) **Establish Indicator Goals for each ORV Indicator.** Indicator Goals specifically define what the Indicator should be to fulfill the Protection Goals for each Outstanding Resource Value. Indicator Goals are typically quantifiable to facilitate measurement of success in reaching goals. For example, maintaining less than 4% impervious surface levels in the watershed is one indicator goal for "Water Quality."
- (4) **Performed a Threat Analysis of Outstanding Resource Values** – Identified specific threats to the ORVs and prioritized them based on the significance and likelihood of their potential impact.
- (5) **Determined Existing Resource Protection** – Performed a comprehensive review of regulations, plans and policies at the local, state and federal level and assessed how well they are implemented. Identified recent municipal, state and federal actions that protect the ORVs.
- (6) **Identified Potential Gaps in ORV Protection** – Analyzed and assessed the effectiveness of existing resource protection and identified any potential protection gaps by comparing ORV goals with potential threats and current resource protection levels.
- (7) **Established Recommended Management Strategies Based on Gap Analysis –** Where gaps were identified between exiting protection measures and desired levels of protection, management strategies to fill such gaps were established. Management strategies include recommended management tools and identification of the stakeholders to lead the tool's implementation.

It is important to note that not all tools will necessarily be applicable to all communities or other partners, as some communities may have already adopted certain tools or have decided on other approaches to achieve the same goals.

In addition to these seven steps the Management Subcommittee spent a substantial amount of time working with the local land use commissions and other stakeholders on crafting the document. Some of the key actions taken include:

- In March 2005 the Study Committee held a first-ever Eightmile Land Use Commissioner Summit. Over 40 local land use decision makers from the Planning, Zoning, Inland Wetlands and Conservation Commissions of the three major watershed towns (East Haddam, Lyme and Salem) attended the Summit. This unique get-together was an opportunity for Study Committee members and local land use decision makers to exchange ideas and share information. Study Committee members explained the process involved in developing the watershed management plan, and reviewed significant management issues they have identified to date. Commission members then offered critical feedback on the planning process, opinions on the identified management issues, and preferences for how to move forward to complete a draft plan.
- Multiple meetings with staff and chairman of the local land use commissions as well as multiple presentations to the full commissions were completed to keep the commissions up-to-date regarding progress in developing the plan, and to collect feedback on specific potential proposals to be included in the management plan that would require specific actions to be taken by the commissions
- A watershed-wide community meeting to present the draft plan to the general public in order to collect feedback and comments on its contents.
- The CT River Watershed Coordinator for the CT Department of Environmental Protection participated in the entire management plan development process as an active member of the Study Committee's Management Subcommittee As well; a substantial review of the plan was performed by key DEP staff and management officials.
- After substantial review and comment all seven land use commissions of the three communities including the Planning and Zoning Commissions and the Inland Wetlands and Watercourse Commissions in all three towns as well as the Conservation Commission in East Haddam, all formally endorsed Wild & Scenic designation and the Management Plan. The Commissions endorsed their pursuit of Tier One management tool implementation as well. See Chapter 10 for a copy of the final endorsements.
- The Connecticut General Assembly also conveyed their support for designation and the Management Plan by unanimously passing Public Act 05-18 An Act Concerning Designation of the Eightmile River Watershed Within The National Wild and Scenic River System. The Act, which the Governor signed into law on May 9, 2005, both conveys the state's support for designation and directs the CT Department of Environmental Protection to cooperate with the implementation of the Management Plan. See Chapter 10 for a copy of the Act.



Land Use Commissioners Summit, March 31 2005. Photo courtesy of N. Frohling.

ROLE OF THE PARTNERS

The Partnership Wild & Scenic Rivers effort is based on a clear understanding of what the roles and responsibilities are for each partner involved with implementing the long-term management strategy for the river system. Main partners include landowners, local municipalities, the state, and the National Park Service if designation is achieved.

Landowners

The voluntary participation of local private landowners is a key to overall management plan success. While landowners will be under no new regulations or mandates as a result of designation, it is hoped they will be supportive of land stewardship practices that are consistent with the outstanding resource value goals and recommended tools as described in this plan. It is clear landowners in the Eightmile River Watershed have been excellent stewards of the land. It is the intention of this plan to provide local landowners with additional educational and technical tools as needed and requested in order to provide them with the support necessary to continue to be leaders in protecting the watershed ecosystem. An example of areas where local landowner stewardship is important includes lawn management, promotion and care of native river side vegetation, controlling erosion, and invasive species management. Local landowners are also encouraged to become one of the town representatives appointed to the Eightmile River Wild & Scenic Coordinating Committee, a non-regulatory body that will oversee the implementation of the management plan. (See Chapter 3 Administrative Framework for details).

Local Municipalities

The local land use commissions have done an outstanding job in establishing a conservation minded approach towards the management and protection of the watershed's resources. Their involvement has been a cornerstone of developing this management plan.

The role of each municipality is voluntary and the actions each town may take are solely up to the towns to decide. The plan calls for each town to be an active participant in achieving the goals for the watershed's outstanding resource values. The Plan provides a series of recommended tools for local land use commissions and other town entities to pursue implementing in order to achieve those goals. The tools may or may not be the preferred approach of the town to achieve the desired goal, but they provide overall direction and recommendations as to the preferred approach the Study Committee has identified. The towns will be members of the Eightmile River Wild & Scenic Coordinating Committee as well, and are asked to appoint two members that will represent the town and its interests on the Committee.

The State

The State of Connecticut, through the Department of Environmental Protection, has distinct roles in managing water quality, water diversions, and discharges into waterways, among many other things. The State is a leader in open space conservation through policy and funding decisions and are a major landowner and manager owning significant areas of state forest and park land within the watershed. As well the State Department of Transportation manages a substantial amount of road miles within the watershed that can have profound effects on local water quality and aquatic health. Similar to the towns, the state's role is to be an active participant on the Eightmile River Wild & Scenic Coordinating Committee, working cooperatively with all the partners to implement the management plan. When making planning, policy, permitting or management decisions that may affect the outstanding resource values of the Eightmile River Watershed, the state will take into consideration the goals and recommendations established in the Plan. The State is asked to be a member of the Eightmile River Wild & Scenic Coordinating Committee. In April of 2005 the Connecticut General Assembly unanimously passed, and the Governor signed, a bill supporting designation of the Eightmile River Watershed as a component National Wild & Scenic Rivers System and committing state cooperation in implementing this management plan. (Public Act No. 05-18 An Act Concerning Designation of the Eightmile River Watershed within the National Wild & Scenic River System).

The National Park Service

If designation as a Wild & Scenic River is achieved for the Eightmile River Watershed the National Park Service will coordinate any funding that is authorized by Congress for use in implementing the Eightmile River Watershed Management Plan. The NPS will be an active participant on the Eightmile River Wild & Scenic Coordinating Committee and, as funding allows, will provide staff support to coordinate committee activities.

The National Park Service will also represent the Secretary of the Interior in fulfilling the legislative mandates of the Wild and Scenic Rivers Act. The NPS will review any proposed projects that require a federal permit or use federal funding to ensure the project is consistent in protecting and enhancing the values for which the Eightmile River Watershed is designated as a component of the Wild and Scenic Rivers System.

There are no new regulatory permits associated with the designation. The National Park Service accomplishes this review 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 required project review processes of the National Environmental Policy Act which establishes the process under which federal agencies must conduct environmental impact reviews of proposed federal actions.



Governor Rell and other dignitaries at the signing ceremony of the Eightmile River State legislative endorsement.. Photo courtesy of L. Bireley.

ADEQUACY OF PROTECTION

An important component of the management plan development process was determining the adequacy of existing protection mechanisms to protect and enhance the watershed's outstanding resource values. Determining adequacy achieves two objectives:

- (1) Proving that local communities meet the requirements of Section 6(c) of the Wild & Scenic Rivers Act.

Section 6(c) of the Wild & Scenic Rivers Act 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.

Local, state and federal regulations, combined with protected lands and physical constraints to development (i.e. floodplains, wetlands, topography, etc.) create enough of an existing protection scheme to make federal condemnation of lands unreasonable and unnecessary. While no new actions are deemed required by the towns to meet the requirements of Section 6(c), the management recommendations in Section VI are considered critical to the overall long-term quality of the watershed's outstanding resource values.

At the local and state level, a number of key actions underscore the current level of protection and the dedication to river and watershed conservation:

- Local upland review areas are in place in all three communities. These are the areas within 100 feet of wetlands and watercourses in East Haddam and Lyme, and 75 feet in Salem. Municipal Inland Wetland and Watercourse Commissions can regulate activities in upland review areas that would likely impact wetland or watercourse function. Reviews in upland areas may include assessing and regulating impacts from a proposed activity on hydrologic, water quality and ecological functions.
- All three towns have adopted net buildable area requirements in their subdivision regulations recognizing new construction should be compatible with the carrying capacity of the land to sustain it. In addition, Salem requires 75% of the net buildable area be outside of the upland review area, and Lyme requires all of the net buildable area be at least 100 feet back from wetlands and watercourses.
- Local communities, working in partnership with local land trusts, the state and The Nature Conservancy, have directly preserved 28% of the watershed (over 11,000 acres of land), and 25% of all river frontage within 100 feet of the 160 miles of river and stream in the watershed.

- The State of Connecticut led an effort that removed the second to last remaining dam in the watershed that caused fish passage to be blocked. Preparations led by The Nature Conservancy are under way to remove the last major dam by the spring of 2006.
 - The Town of Lyme adopted new regulations along Hamburg Cove implementing a riparian setback for structures and vegetative cutting, protecting important riparian function.
- (2) Identifies any additional protection goals deemed desirable by the Management Subcommittee.

Overall it was determined the Eightmile Watershed communities are doing a good job in managing for the outstanding resource values of the Eightmile River Watershed. In just the last few years actions such as implementation of net buildable area requirements and acquisition of significant amounts of protected open space lands have brought tremendous benefit to the watershed.

To ensure the long-term protection and enhancement of all the watershed's outstanding resource values, the Management Subcommittee identified a number of actions local communities can take in the short-term and long-term to achieve desired protection levels.

Determining the recommended tools was the result of a rigorous and scientifically sound process that included:

- Identification of Outstanding Resource Values (ORV)
- Identification of a resource protection goal for each ORV
- Review and analysis of current local state and federal regulations, plans and policies
- Assessment of current threats to resource values
- Identification of gaps in resource protection based on current protection and known threats
- Recommended tools to fill protection gaps. These recommended actions are detailed in Section VI.

TIER ONE AND TIER TWO MANAGEMENT TOOLS

The management recommendations found in Section VI are organized into two categories: Tier One and Tier Two.

It is important to note that all recommendations for local commissions and other partners are just that, recommendations. This planning document or the powers of a Wild & Scenic designation cannot force a community to adopt them. The actual implementation of these recommendations will require all the formal procedures the commissions must follow, especially in considering and potentially adopting any new regulations, including public notice, public hearings, and commission deliberation prior to making a final determination.

Tier One recommended tools are high priority items that we are asking management plan partners, including the local communities and the state, to work on implementing first. Through endorsement of the management plan and the Tier One tools we are asking for a commitment from each partner to begin work on pursuing the adoption of the recommended actions within six to twelve months of achieving affirmative votes of support for Wild & Scenic designation at town meetings. As a first step in pursuing implementation of each tier one tool we are asking each partner to establish a timeline for completing such an implementation process. Implementation of these tools is not a mandate. Local and state procedures will determine the ultimate outcomes of the implementation process.

It is recognized that it is unlikely that designation and the securing of funds to support designation will be achieved in the next 6-12 months. As such, it is recommended that the Eightmile River Wild & Scenic Coordinating Committee be established upon the dissolution of the Study Committee. This action will not only provide continuity and continued momentum between the end of the study process and a formal designation, it will also show Congress the high level of partner commitment to the long-term preservation of the watershed.

The implementation of some of the Tier One tools will take significant human resources, time and possibly funding to complete. As such it will be the intent of the Eightmile River Wild & Scenic Coordinating Committee and the National Park Service to prioritize any funding or technical resource support, if a designation occurs, on implementation of these items. Management Plan partners, including local communities and the state, while not expected to implement all the recommended tools if a designation does not occur, are strongly encouraged to implement all of the parts of the plan that can be done without undue burden on human or financial resources.

The benefits of implementing the Plan regardless of designation are many. It builds upon the extensive amount of information and knowledge gained through the Wild & Scenic study process, including establishment of a good working relationship amongst the towns and the many other partners. As well, it provides the justification and tools to leverage outside resources to support management plan goals. If designation is successfully pursued, but achieving it takes longer than anticipated, the implementation of some of the plan's components during the legislative process can only strengthen the show of commitment to Congress by all the partners.

Tier Two recommended tools are longer-term actions partners can take to further protect watershed resources. It is anticipated it will take 2-5 years to implement the majority of the Tier Two tools. Again, this will partially depend on the ability of the ERWSCC to support the partners in tool implementation when needed.

Many of the Tier Two tools recommend establishing additional scientific baseline information and monitoring for the outstanding resource values. The indicator goals provided with each ORV often recommend a benchmark to measure quality, or level of potential impacts to quality, over time. This information is critical to the overall success of the plan and its utility for assessing and documenting the level of protection and enhancement achieved through the plan's implementation.

The Tier Two tools focus on other longer-term opportunities as well, including: the ongoing need to provide land use decision makers with current, accurate and scientifically sound information and technical advice to help in their decision making processes; the use of voluntary open space conservation to protect important values; and outreach and education initiatives to important target audiences such as landowners, school groups and land use commissions.



Administrative Framework

EIGHTMILE RIVER WILD & SCENIC COORDINATING COMMITTEE

Organizational Structure and Membership

The Eightmile River Watershed Management Plan is based on cooperative effort of all stakeholders to oversee the long-term protection of the Eightmile River Watershed. Landowners, local communities, the state, user groups, and federal agencies all have active and indispensable roles in maintaining the high quality of the watershed ecosystem.

To ensure ongoing involvement from a broad range of stakeholders in achieving successful implementation of the management plan, the Eightmile River Wild & Scenic Coordinating Committee (ERWSCC) will be established.

The purpose of the Eightmile River Wild & Scenic Coordinating Committee, which will have an advisory role only, includes:

- Coordinating the implementation of the watershed management plan.
- Bringing the stakeholders in watershed management together on a regular and ongoing basis to facilitate continued cooperation and coordination.
- Providing a forum for all watershed interests to discuss and resolve issues.

ERWSCC will be advisory only and will not have regulatory or land acquisition authority. The Committee may provide advice to existing entities that have management or regulatory authority affecting the river, but it will not have the power to dictate the actions or decisions of any of those entities. The intent of ERWSCC is to complement and support the roles and activities of existing interests, rather than compete with them.

Responsibilities

ERWSCC will assume the following responsibilities:

1. Implement the Eightmile River Watershed Management Plan

ERWSCC will be the lead organization in ensuring that implementation of the plan occurs and outstanding resource value goals are achieved.

2. Monitor outstanding resource values with respect to the degree they are protected, degraded or enhanced during implementation of the plan.

3. Address River-Related Issues

ERWSCC will pursue cooperative resolution of issues affecting the outstanding resource values of the Eightmile River Watershed. 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.

ERWSC will be available to evaluate specific proposals that could affect the watershed, and provide comments 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 members of ERWSSC may recuse themselves from participating in such activities as they deem necessary to avoid conflict of interest issues. Examples of proposals that ERWSSC could choose to review and comment on include, but are not limited to:

- zoning changes for lands along the river or its tributaries that affect the watershed as a whole
- development projects or other land use activities affecting outstanding resource values
- applications for state permits (e.g., point source discharges; water withdrawals)
- changes to state programs or policies (e.g., statewide water quality standards; land management practices on State forests)
- 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 cooperate with ERWSSC on matters related to the watershed, but it will be the Committee's final responsibility to keep informed of proposals under local jurisdiction that it may wish to review and provide comments on. Individual Committee members, particularly the town representatives, will play an important role in keeping the group abreast of local issues.

The State of Connecticut will be requested to notify ERWSSC of certain state or federal permit applications associated with wastewater and stormwater discharges to both 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 watershed's outstanding resource values, and give the Committee the opportunity to comment.

4. Review and update the Eightmile River Watershed Management Plan

It is expected and anticipated that changes to this plan will be needed over time. Advances in resource management strategies or technology, as well as changes to regulations, laws, policies or programs, may require the plan to be revised.

ERWSSC is responsible for reviewing the plan on a regular basis to determine if updates are necessary. It is recommended that a thorough review occur every five years. Changes to this plan can only be made if they are voted on and approved by ERWSSC and may require posting in the Federal Register for public comment.

The public should be given ample opportunity to participate in future revisions to the plan.



Study chairman Anthony Irving (center) talks with local landowners.
Photo courtesy of J. Rozum.

5. Prepare periodic status reports

ERWSCC will prepare brief annual reports on the status of protection of the watershed and implementation of this management plan.

These reports will serve two primary purposes:

- a. to inform the general public, local officials, the Governor, the General Assembly, and, if the watershed is designated as a component of the wild and scenic river system, Congress and the Secretary of the Interior about the conditions of the river and watershed; and
- b. to publicize any pressing needs or issues requiring attention or assistance from the local, state and/or federal governments.

Membership

The following entities constitute the core voting membership of ERWSCC. Each municipality will have two representatives and one alternate, all other entities will have one representative and one alternate. There can be no additional core members.

- Town of East Haddam
- Town of Lyme
- Town of Salem
- East Haddam Land Trust
- Lyme Land Conservation Trust
- Salem Land Trust
- The Nature Conservancy
- State of Connecticut Department of Environmental Protection
- U.S. Department of the Interior

Appointments

Representatives and alternates will be appointed as follows:

- Town representatives by the boards of selectmen – while not a requirement a representative from a local land use commission and a riverfront landowner in town is encouraged.
- Land Trust representatives by their boards of directors
- The Nature Conservancy representatives by the State Director
- State representatives by the Commissioner of the Department of Environmental Protection
- Department of the Interior representatives by the Northeast Regional Director, National Park Service

Additional Members

Membership of ERWSCC may be expanded by a vote of core members to include non-core members based on the following provisions:

- The candidate organization has demonstrated a sustained interest and capacity to support the purposes of the Wild and Scenic River designation.
- Participation of the candidate organization is likely to enhance the effectiveness of ERWSCC in its efforts to implement the Eightmile River Watershed Management Plan.

Voting status of non-core members will be at the discretion of the core membership.

Procedures

Establishment: It is recommended that ERWSCC be established upon dissolution of the Eightmile River Wild & Scenic Study Committee. This action will not only provide continuity and continued momentum between the end of the study process and a formal designation, but will also show Congress the high level of partner commitment to the long-term preservation of the watershed. The National Park Service can only become a formal member of ERWSCC as a result of congressional authorization through the achievement of a Wild & Scenic River designation.

Decision-making: The committee will operate primarily based on consensus. However, for certain issues such as changes to the management plan or bylaws, election of officers, addition or removal of members and expenditures of funds over certain levels, formal votes may be taken. Because the combined town representation on the Committee does not on its own represent a majority, it is recommended that the by-laws identify a voting process that ensures combined town representation cannot be over-ruled by non-municipal representatives.

Officers: The Committee will have four officers: chair, vice-chair, 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.

Quorum: A majority of the members of the Committee will constitute a quorum.

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

Memorandum of Understanding: ERWSCC 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 this management plan under their existing traditional jurisdiction or to which they have been assigned specific responsibility.

Funding/Staff

To implement the responsibilities identified above, ERWSCC 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 general operations or specific responsibilities (office space and equipment, printing and distributing information, education and outreach, etc.).

If the watershed is designated as a component of the national Wild and Scenic River System, congressional appropriations will be sought to assist with the establishment and initiation of the ERWSCC. If adequate funding is forthcoming, the NPS could (1) provide the necessary staff support for the ERWSCC from its own personnel, or (2) transfer money to ERWSCC through 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 requested and if sufficient appropriations are available.

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

Cooperative Agreements between ERWSCC and the NPS

Cooperative Agreements are formal written agreements between NPS and a local partner to create the ability to distribute federal funding or other federal assistance for supporting the implementation of the Eightmile River Watershed Management Plan. The local partner would act, in essence, as the fiscal agent for ERWSCC and NPS. Decisions on how funds are allocated, if they become available, remain with ERWSCC in consultation with NPS.

If Wild and Scenic designation occurs NPS may enter into formal cooperative agreements with ERWSCC (if it were incorporated), or any of its member organizations pursuant to Sec. 10(e) and/or Sec. 11(b)(1) of the Wild and Scenic Rivers Act. History on other Partnership Wild & Scenic Rivers in New England has shown that Cooperative Agreements are typically established with a local non-profit organization, such as a land conservation group or a watershed association. For example, during the Eightmile River Wild & Scenic Study a Cooperative Agreement was established between the Lyme Land Conservation Trust 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.

Relevant passages from the Wild and Scenic Rivers Act follow.

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.



Hamburg Cove and the lower Eightmile River valley.
Photo courtesy of J. Stocker.



Protecting the Outstanding Resources Values of the Eightmile River Watershed

INTRODUCTION

Following are the specific management recommendations of the Eightmile River Study Committee to achieve the long-term protection and enhancement of the Eightmile River Watershed's outstanding resource values.

The information provided in this section includes: (Please see appendices for more information on these topics)

- A summary of each outstanding resource value (ORV).
- The potential threats that could degrade the quality of each ORV.
- The current protection measures in place for each ORV.
- Gaps in the current protection mechanisms available to protect the ORVs.
- The protection goal for each ORV.
- **Indicators for each Outstanding Resource Value.** Indicators are the primary characteristics which describe the ORVs (in terms of either important features or processes that define or affect the ORV). Indicators are also important for being able to monitor the quality and long-term viability of the ORV. For example, impervious surface levels are one indicator for "Water Quality."
- **Indicator Goals for each ORV Indicator.** Indicator Goals specifically define what the Indicator should be to fulfill the Protection Goals for each Outstanding Resource Value. Indicator Goals are typically quantifiable to facilitate measurement of success in reaching goals. For example, maintaining less than 4% impervious surface levels in the watershed is one indicator goal for "Water Quality."
- **Recommended Tier One and Tier Two management tools** to be implemented to achieve the goals for each ORV. Each tool identifies the lead agency or organization to achieve its implementation.

Indicator goals are an important component of the recommendations, defining specifically what it means to achieve each ORV goal. Indicator goals are quantitative wherever possible to facilitate measurability and clear definition; however some are in the form of a strategy or policy. The indicators and their goals were developed based on review and consideration of multiple data, assessments and scientific sources and the combined experience and wisdom of the Eightmile Wild and Scenic Study Committee and NPS staff. The Committee balanced a strong commitment to sustaining an outstanding river system with the need to be realistic, feasible and reasonable to all interests. It is intended that as further information becomes available which can better quantify the indicators and/or which may suggest amending these indicators that the Management Plan be flexible enough to allow for such amendment. Any such amendment should continue to ensure an ability to meet the goals and long term quality of the ORVs. The proposed management tools stem in part from considering the Indicator Goals, however, Indicators and Indicator Goals do not themselves represent proposed management tools. It is intended that future monitoring and/or further consideration of the Indicators and Indicator Goals may suggest that additional suggestions for management recommendations may be warranted, however that will be decided by future management efforts.

The recommended management tools were identified as a result of the threats, protection, and gap analysis. The tools are divided into tier one and tier two. The tier one tools are considered the most critical to implement in the short-term and as such it is recommended that within 6-12 months of achieving an affirmative vote of support for Wild & Scenic designation at a town meeting partners will begin the process of implementing tier one tools and will establish a timeline in which to complete such a process. The tier two tools are anticipated to take 2-5 years to implement. Each tool description is preceded by the agency or organization that is recommended for leading the implementation of the suggested tool.

As with the indicators and their goals, it is intended that as further information, better tools, and new innovative cost-effective approaches become available to meet the ORV protection goals such knowledge and strategies should be implemented where appropriate. It is important to note that not all tools will necessarily be applicable to all communities or other partners, as some communities may have already adopted certain tools or have decided on other approaches to achieve the same goals.

As stated earlier, the recommended tools for local commissions and other partners are just that, recommendations. This planning document or the powers of a Wild & Scenic designation can not force a community to adopt them. The actual implementation of these recommendations will require all the formal procedures the commissions must follow especially in considering and potentially adopting any new regulations, including public notice, public hearings, and commission deliberation prior to making a final determination.

Many of the recommended tools require human and financial resources to implement. One of the main benefits of achieving Wild & Scenic designation is the ability to access funding support and technical assistance from the National Park Service to help protect the watershed. It is understood that the local communities, the state or other agencies or organizations may not have the ability to implement these proposed actions without financial or technical support.



Kayaker on the Eightmile River. Photo courtesy of J. Stocker.

The management plan partners, including local municipalities and the state, are strongly encouraged to work on implementing the Draft Eightmile River Watershed Management Plan to the best of their abilities regardless of a Wild & Scenic Designation being achieved, recognizing that the implementation of tools that require funding outside the normal expenditures of the partners may not be pursued until or unless outside funding is secured. If designation is achieved and funding support secured the Eightmile River Wild & Scenic Coordinating Committee and the National Park Service will focus available resources in support of the partners achieving the implementation of the recommended tools.

A. WATERSHED HYDROLOGY

1. The Importance of Watershed Hydrology

Watershed hydrology describes the journey of water through a watershed system. The processes that move water through the system such as precipitation, evapotranspiration, groundwater infiltration and surface water flow all have significant effects on overall ecosystem health.

Instream flow, the amount of surface water flowing in a river or stream at any given time, has been called the "master variable" in a river system. Instream flow affects a multitude of river ecosystem functions including aquatic life and its related habitat, nutrient cycling, sediment transport, water temperature, river bank stability, groundwater recharge, and a host of other features. Water from river and groundwater sources also plays an important role in sustaining human health by providing drinking water, agricultural irrigation, fire protection, recreational opportunities and wastewater assimilation of discharges from septic treatment and other sources. The ability to balance instream needs with out-of-stream uses is a difficult challenge endemic to the whole country, and certainly Southern New England and Connecticut. Unlike many watersheds in Connecticut today the Eightmile River Watershed is not relied upon as a major source of public or industrial water supply, nor is it impacted by large point source discharges from wastewater treatment plants or industrial sources. As such, the Eightmile River Watershed is in a unique position sustaining an intact hydrologic system.

River flow can be influenced in a number of ways, including: (1) diversions of water out of the river by either direct withdrawals or groundwater wells; (2) alteration of flow from dams; (3) discharges of effluent into the river from treatment plants, industrial sources and stormwater pipes; and (4) influence of impervious cover, such as roadways, parking lots and roof tops, that both generate stormwater runoff and interrupt the important connection between surface water and groundwater critical to maintaining a natural flow regime.

Consideration of these influences in the Eightmile River Watershed finds:

- No substantial effect from water diversions. Currently only one consumptive groundwater diversion exists.
- No dams are currently regulating flow.
- There are no direct point source discharges from industrial sources or wastewater treatment plants and therefore no impacts to hydrology.
- The Eightmile River Watershed has very low levels of impervious cover, currently at 3% of the total watershed area, minimizing the negative effects caused by stormwater runoff and interruption of groundwater infiltration.
- Land cover in the Eightmile River Watershed is a combination of high levels of forest cover coupled with low levels of developed area. The recovery of the forests and wetland systems of the watershed are allowing for the stabilization of low flow patterns, reflecting a system in ecosystem recovery from an intense agrarian past.

Combining all these factors it is apparent the Eightmile River Watershed hydrologic regime is operating without major impediments or influences and as such is a naturally functioning system. It is rare in Connecticut, especially along the coast, to have a watershed system of this size with a natural intact flow regime in place. As such the Eightmile River Watershed can be considered a unique example of how a natural hydrologic system in Connecticut functions and is considered an outstanding resource value based on such exemplary characteristics.

A full report on Watershed Hydrology as an outstanding resource value can be found in **Appendix 2 – Outstanding Resource Value Report Watershed Hydrology**.

2. How Watershed Hydrology is Threatened

An assessment of watershed hydrology threats in the Eightmile River Watershed identified 18 potential activities that could cause hydrologic conditions to degrade. The greatest threats identified come from the possible impacts of increases in impervious surfaces and in turn stormwater runoff. Increased levels of impervious surface can cause increases to the velocity, frequency, volume and duration of stormwater runoff ultimately impacting natural flow regimes. As well, impervious surfaces can cause a loss of natural groundwater infiltration capacity preventing the replenishment of groundwater aquifers. Groundwater is a key contributor to instream flow in New England rivers and streams, especially in low-flow summer conditions. A loss of groundwater may cause lower flows for longer durations, especially in the driest times of the year. In addition, the potential for new or expanded surface and groundwater diversions for irrigation needs on golf courses, recreational fields, or agricultural fields was also identified as a significant threat.

The complete threat analysis can be found in **Appendix 7 – Analysis of Existing Protections and Potential Gaps in Protection** and **Appendix 8 – Summary of Analysis of Management Issues and Threats to outstanding Resource Values**.

3. Existing Protections and Gaps

In order to understand potential additional protection needs for watershed hydrology a comprehensive review was completed of current protection measures planned and implemented at the local, state and federal level.

Some of the key existing protections for watershed hydrology at the local, state and federal level include:

- East Haddam uses the most current Best Management Practices (BMP's) for the design and installation of new stormwater management systems by following the Connecticut Dept. of Environmental Protection Stormwater Quality Manual.
- Local inland wetland commissions have the authority to regulate water diversions of any size.
- The State of Connecticut regulates all diversions of water over 50,000 gallons per day.
- Open space protection at the local level is keeping large tracts of forest land intact, and preventing new imperviousness or stormwater runoff from occurring.
- Inland Wetland regulations in all three towns focus on minimizing impacts to wetlands and watercourses.

A number of potential additional tools have been identified that could further advance the protection and enhancement of watershed hydrology. These additional tools are discussed below in Section F.

Two summaries of existing protection are available in the appendices. One is a comprehensive review of municipal regulations and related plans for East Haddam, Lyme and Salem (**Appendix 12 – Municipal Regulation and Policy Review**) and the second is a summary of local, state and federal protections specific to each threat category (**Appendix 7 – Analysis of Existing Protections and Potential Gaps in Protection**).

Gaps in protection were identified as a result of comparing known watershed hydrology threats with existing protection measures. Primary gaps in protecting watershed hydrology include:

- Limited ability to manage impervious surface levels
- State water quality classifications do not provide a standard for instream flow.
- Agricultural impoundments are exempt from local inland wetland regulations
- It is not clear whether existing dams within the watershed are required to operate as run-of-river operations.
- Water diversions grandfathered by the state are not reviewed or regulated regarding potential environmental impact.
- There is currently a lack of necessary scientific data to adequately assess the potential impacts of existing or new surface or groundwater withdrawals.
- Gravel extraction regulations in each community do not address hydrologic impacts of potential graveling operations.
- It is difficult to assess or manage the cumulative affects of timber harvesting on watershed hydrology.
- Local Inland Wetland Commissions have not historically regulated the impacts of surface or groundwater withdrawal activities.

4. Watershed Hydrology Protection Goal

The watershed hydrology goal for the Eightmile River Watershed is to understand, enhance and protect the surface and groundwater hydrology of the Eightmile River Watershed in order to maintain a natural hydrologic condition in the Watershed.

5. Watershed Hydrology Indicators

- a. Impervious Cover
- b. Dams and Flow Manipulation
- c. Surface or Ground Water Diversions
- d. Riparian Corridor condition
- e. Watershed Forest & Vegetative Cover
- f. Aquifer Storage and Recharge
- g. Natural Stream Flow and Ground Water Level Conditions
- h. Intact Natural Processes

6. Recommended Indicator Goals and Tools – Watershed Hydrology

6.1 Impervious Cover

Goals

- a. Future build-out results in no more than 10% impervious surface in any given local basin not already exceeding the target. For those basins already over 10%, no new increase in effective impervious area. Effective impervious area is the proportion of the total impervious area that has a direct hydraulic connection to the drainage collection system, such as through a stormwater drainage system. (See Map 7 which depicts local basins as defined by CT DEP Bulletin No. 37)
- b. Future build-out results in no more than 4% impervious surfaces for the entire Eightmile Watershed.

Recommended Tier One Tools

- a. *Local Municipal P&Z* – Each community adopts maximum impervious surface limits of 10% per local watershed and 4% for the Eightmile River Watershed as a whole.
- b. *Local Municipal P&Z and Eightmile River Committee* – Working with the Eightmile River Committee, undertake a detailed assessment of current and potential imperviousness in each local watershed for each community. Through such an analysis identify the amount of impervious cover still possible in each local watershed before the maximum impervious cover limit is reached. In some parts of the watershed imperviousness levels less than the proposed goals may be ideal to protect hydrology and other outstanding resource values, while in other areas more imperviousness may be acceptable if it can be shown degradation to resource values does not occur. The analysis should include if possible an assessment of where such areas exist and what impervious levels are most appropriate to set as targets.
- c. *Local Municipal P&Z* – Analyze the implementation of potential tools to manage impervious surface levels, including the East Haddam concept and Lyme approach. East Haddam considers using zoning to establish a potential maximum impervious cover per local watershed, while Lyme has adopted per lot maximum impervious cover requirements. (See **Appendix 9 – Tier One Tools Recommendation Details**) Other approaches to consider may include adopting stormwater design measures that result in producing no effective change in the surface water and groundwater hydrology of a given site. Such an approach may result in providing flexibility in total imperviousness levels. Determine the most effective, appropriate and realistic tool for managing impervious surfaces and pursue its adoption.
- d. See Unique Species & Natural Communities ORV Item 6.4 (and Section VII E. Land Protection Program Proposal) – Using open space conservation program for key land protection priorities.

Recommended Tier Two Tools

- a. *Local Municipal P&Z* – Consider implementation of conservation subdivision design standards or density based zoning requirements to help manage growth in impervious cover.

- b. *Local Municipal Open Space Committee and Land Trusts* – Pursue open space planning and acquisition of key parcels associated with the hydrologic well-being of the watershed, especially those associated with important aquifer and riparian areas.
- c. *Eightmile River Wild & Scenic Committee* – Implement public education and outreach initiatives on the impacts of impervious surfaces.

6.2 Dams and Flow Manipulation

Goals

- a. No new man-made dams, especially on second order or larger streams within the Eightmile River system. (It is recognized that municipalities and the state do not have the authority to prohibit dams outright. The intent of this goal is to provide a way to measure potential changes to overall quality of watershed hydrology.)
- b. Maintain or achieve “run of river” operation for all existing dams. (It is recognized this may not be feasible in all cases if future, legitimate needs for water are authorized under a state water diversion permit.)
- c. Remove man-made dams that clearly alter natural riverine hydrology causing an inconsistency with the overall hydrology goal where feasible and appropriate. The outcomes associated with the proposed Tier One tools in Item 3 Surface and Groundwater Diversions should provide guidance in making a determination of inconsistency.

Recommended Tier One Tools

None

Recommended Tier Two Tools

- a. *State, Eightmile River Wild & Scenic Committee, Landowners* – Work to identify and remove any remaining man-made dams that are clearly altering natural riverine hydrology causing an inconsistency with the overall hydrology goal where feasible and appropriate. **Note:** In some instances dam removal may not be considered the best alternative due to degradation of habitat.

6.3 Surface or Ground Water Diversions

Goals

- a. No new or expanded surface water diversions until and unless compatible with sustaining the goals of hydrology, unique species and watershed ecosystem ORVs can be shown through scientifically sound flow/habitat models. While this is the goal it is recognized no diversion can be prohibited outright. All proposed diversions have the right to be pursued through the state diversion permitting program, a process that does not just assess environmental effects but also social and economic factors as well.
- b. No new or expanded groundwater diversions until and unless it can be demonstrated that such a diversion will result in no detectable alteration in surface water flow or compatibility with sustaining the goals of Hydrology, Unique Species or Watershed Ecosystem ORVs as shown through scientifically sound flow/habitat models. See above caveat recognizing no diversion can be prohibited outright.

Recommended Tier One Tools

- a. *State and Eightmile River Wild & Scenic Committee* – ERWSCC to communicate with all appropriate bureaus, divisions and permitting programs within CT DEP to determine the types of hydrologic information that would be most beneficial to the agency when reviewing future surface and groundwater diversion permit applications. Future hydrologic research and modeling that is supported by ERWSCC should benefit the agency's ability to make scientifically sound assessments of future diversion permit applications.
- b. *Eightmile River Wild & Scenic Committee* – Complete scope of work for the instream flow and groundwater modeling research necessary to both achieve an understanding of the level of surface and groundwater needs to sustain the wetland, vernal pool, riparian and aquatic resources of the Eightmile River Watershed, and the ability to assess the impacts of potential activities that could alter surface or groundwater levels on such resources. Build upon the work already completed by the Northeast Instream Habitat Program at the University of Massachusetts.
- c. *Eightmile River Wild & Scenic Committee* – Allocate adequate funding to complete necessary instream flow and groundwater modeling research. Identify and pursue funding partners to leverage and maximize Committee funds.
- d. *State and Eightmile River Wild & Scenic Committee* – Based on research and modeling efforts establish year round target flow levels for all perennial waterbodies in the Eightmile River Watershed along with an ability to predict changes in hydrology based on changes or alterations to land use.

Recommended Tier Two Tools

- a. *Local Municipal P&Z* – Consider implementation of aquifer protection regulations to protect groundwater resources. While the Eightmile River Watershed has no aquifers that fall under state aquifer protection requirements as public water supply sources, virtually all the residents of the watershed get their drinking water from groundwater sources through their own individual wells. The purpose of this recommendation is to support protection of all aquifers important to overall public health and watershed well-being.
- b. *Local Municipal Open Space Committee and Land Trusts* – Pursue open space planning and acquisition of key parcels associated with the hydrologic well-being of the watershed, especially those associated with important aquifers.
- c. *Local Municipal IWC* – Regulate all commercial diversions under 50,000 gallons per day. Diversions over 50,000 gallons per day are regulated by the state DEP but can be regulated by the local IWC as well.

6.4 Riparian Corridor Condition

Goal

Sustain a minimum of 80% forest cover and 90% vegetative cover of native species within the 100' riparian area for the Eightmile Watershed as a whole.

Recommended Tier One Tools

See Water Quality Sec. 6.1.– Riparian Corridor Condition recommendations to establish a River Protection Overlay Zone, adopt watercourse crossing design guidance, and recognize riparian corridors as priority land conservation areas.

Eightmile River Wild & Scenic Coordinating Committee – Establish a program to provide education and encouragement to private landowners regarding the importance of riparian buffers and the best management strategies that can be implemented voluntarily to ensure riparian buffer values are sustained.

Recommended Tier Two Tools

See Water Quality Sec. 6.1 – Riparian Corridor Condition recommendations related to open space, landowner education, timber management, landscaping, road maintenance and strategies to keep structures out of riparian areas.

6.5 Watershed Forest & Vegetative Cover

Goal

Sustain a minimum of 75% forest cover and 90% natural, native vegetative cover in the watershed.

Recommended Tier One Tools

- a. *Local Municipal Open Space Committees and Land Trusts* – Prioritize land conservation efforts that support sustaining forest cover and natural vegetative cover. See Chapter VII Sec. E for details of proposed land protection program.
- b. See Hydrology Sec 6.1 Impervious Cover – Tier One Tools above to address minimizing increases in impervious cover.

Recommended Tier Two Tools

- a. *Local Municipalities & Eightmile River Wild & Scenic Committee* – Establish a capacity to map detailed landcover information and track landcover changes on a regular basis. This includes tracking changes in the amount of developed area as well as the impacts of timber cutting activities.
- b. *Local Municipal P&Z* – Establish regulations such as maximum building coverage, maximum impervious surface or minimal landscaped area to manage change in forest and vegetative cover.
- c. *Eightmile River Wild & Scenic Committee* – Develop a scope of work and implement an invasive species reconnaissance and removal program.

6.6 Aquifer Storage and Recharge

Goal

- a. Removal of surficial materials is conducted in a way to minimize any alteration of the current groundwater/surface water relationship such that there is no material effect on the base flow of any stream and/or hydrology of any wetland.
- b. Any new impervious surfaces do not alter the groundwater/surface water relationship in a way that could degrade palustrine, lacustrine or riverine species or habitat.

Recommended Tier One Tools

- a. See Hydrology Sec 6.1 Impervious Cover – Tier One Tools above to address minimizing increases in impervious cover.

Recommended Tier Two Tools

- a. *Local Municipal P&Z* – Adopt earth extraction regulations that ensure groundwater/surface water interactions are protected and aquifer storage is sustained so as to maintain natural hydrologic conditions of river, stream and wetland resources.
- b. *Eightmile River Wild & Scenic Committee* – Ensure all local land use commissions have accurate and current information regarding aquifer resources within the Eightmile River Watershed.
- c. *Eightmile River Wild & Scenic Committee* – If requested, provide technical support to towns in reviewing applications associated with earth extraction operations. Agencies that need to maintain impartiality towards certain types of applications, and are members of ERWSCC, may recuse themselves from participating in any discussions or decisions regarding providing such support.
- d. *Local Municipal Open Space Committee* – Identify important aquifers as priority land conservation areas.

6.7 Natural Stream Flow and Ground Water Level Conditions

Goal

Complete MesoHabsim Instream Flow Study to establish target flow ranges for supporting the entire target aquatic community in all seasons. In addition, complete compatible groundwater hydrology modeling to assess change in hydrology associated with land use and/or water withdrawals. These models should be used to establish flow criteria consistent with the hydrology goal. In addition to identifying target flow ranges for supporting the aquatic community as noted above, criteria should be established for maintaining a natural, unaltered hydrograph so that the abiotic characteristics of surface and groundwater hydrology are also sustained. Until such work is completed the U.S. Fish & Wildlife aquatic base flow method is referenced as the criterion for this attribute. Long-term flow management should include the installation of an adequate gauge and groundwater monitoring network to establish a baseline of surface and groundwater levels in all seasons

Recommended Tier One Tools

- a. See Watershed Hydrology Sec 6.3 Tier One Tools Above – Completing necessary instream flow and hydrologic modeling in order to establish target flow levels and an ability to predict hydrologic changes based upon changes in land use.

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee* – Identify partners, such as USGS and CT DEP, along with funding to support the installation of a stream gauge and groundwater monitoring wells within the watershed for establishment of year-round baseline data on surface and groundwater conditions.
- b. *Eightmile River Wild & Scenic Committee* – Provide necessary data and information from research and monitoring efforts to local land use commissions to support their decision-making processes and provide them with general education on the conditions within the watershed.

6.8 Intact Natural Processes

Goals

- a. Maintain existing hydrologic characteristics. See Watershed Hydrology Sec 6.3 Surface and Groundwater Diversions and Sec. 6.7 Natural Stream Flow and Groundwater Level Conditions above for details.
- b. Maintain existing channel morphology. Avoid any new channel hardening and/or restriction of natural channel migration for all perennial streams, unless there is a direct threat to public safety, existing buildings or structures.
- c. Maintain existing sediment and scour characteristics using indicators for:
 - Hydrology ORV
 - Impervious Cover (6.1 above)
 - Dam and Flow Manipulation (6.2 above)
 - Riparian Corridor Condition (6.4 above)
 - Watershed Forest & Vegetative Cover (6.5 above)
 - Natural Stream Flow & groundwater Level Conditions (6.7 above)
 - Unique Species & Natural Communities ORV
 - Presence of Large Intact habitat Blocks (6.4)
 - Water Quality ORV
 - Intact Riparian Corridor (6.1)

Recommended Tier One Tools

- a. See Hydrology Sec 6.3 Surface and Groundwater Diversions Tier One Tools above regarding completion of instream flow study and setting of target flow levels.
- b. See Water Quality Sec. 6.1.b – implementation of watercourse crossing guidelines.

Recommended Tier Two Tools

- a. See Hydrology Sec. 6.7 Tier Two Tools above – Natural Stream Flow and Groundwater level Conditions.
- b. *State and Local Municipalities* – Work with the Eightmile River Committee to develop and adopt guidance and standards for addressing stream bank repairs along roadways. Include guidance on when repairs are necessary and the preferred engineering and construction approaches to implement such repairs. Pursue implementation of such approaches where practicable and feasible.
- c. *Eightmile River Wild & Scenic Committee* – Develop and implement education materials for public and private landowners regarding stream bank conservation issues, including educational information on stream morphology and appropriate strategies to address stream bank management.
- d. See above referenced sections of Hydrology, Unique Species and Natural Communities and Water Quality ORVs for details.



Above: Fraser Brook in the winter. Photo courtesy of L. Reitz.

Below: Snow on the Eightmile. Photo courtesy of L. Reitz.



B. WATER QUALITY

1. The Importance of Water Quality

Healthy river systems can support a myriad of sustainable uses. They provide habitat for unique plants and animals, can serve as a drinking water supply, and offer recreational opportunities such as swimming, boating or fishing. The long term sustainability of such river resources is strongly tied to the quality of the water flow they rely on.

Two key factors were considered when assessing water quality conditions in the Eightmile River Watershed: (1) the status of key chemical and biological indicators; and (2) the level of current threats to water resources.

An important indicator of chemical and biological water quality is provided by the community of bottom dwelling aquatic organisms known as benthic macroinvertebrates. Because some of these organisms are highly sensitive to water pollution and habitat change, the composition of species found living in a river or stream reflects long-term water quality. Benthic macroinvertebrate surveys in the Eightmile indicate that ecological conditions are exemplary in the main stem and very good in the East Branch. The data demonstrate that water quality and aquatic habitat in the Eightmile is not only locally exemplary, but as good as the best rivers studied in the state.

In addition to having outstanding water quality, major threats to water resources that are typically seen in other watersheds are almost nonexistent in the Eightmile. The two primary threats to water quality are point source and nonpoint source pollution. Currently, there are no point source discharges in the Eightmile watershed. Point sources are generally associated with discharge pipes from industrial uses such as wastewater treatment plants or factories. Nonpoint source pollution (NPS), on the other hand, can come from any type of land use, including residential, agricultural, industrial and commercial properties. The most common types of NPS pollution are sediments, fertilizers, pesticides, oils and greases. Once contaminants accumulate on impervious surfaces (e.g., roads, parking lots, and roofs), residential lawns and agricultural fields they are carried by stormwater runoff into wetlands, rivers, streams, lakes, and ponds.

One measure of NPS impairment is the amount of impervious cover. Past scientific research has suggested that in watersheds of up to 10 square miles stream quality and aquatic health can degrade when impervious cover reaches 10% of the total watershed area. Recent research is showing that impervious cover levels as low as 4-5% can have significant effects on aquatic health. A study of over 1,000 streams in Maryland found that brook trout were never found in streams that had contributing watersheds with impervious cover over 4%.

Other key features that indicate high water quality include intact riparian corridor lands and a natural hydrologic system. Riparian corridors are upland areas directly adjacent to streams or rivers that have a biological, hydrological and physical connection to the nearby watercourse. The riparian corridor has many important ecosystem functions, including filtering sediment and other pollutants from stormwater runoff and storing flood waters during seasonal flooding events. Riparian vegetation also stabilizes stream and river banks and provides shade that helps keep water temperatures low and dissolved oxygen levels high. A natural hydrologic system includes maintaining normal stream and river flows. Stream flow affects a number of variables associated with water quality including: water temperature, dissolved oxygen, effluent dilution, effluent assimilation, sediment transport and salinity intrusion.

Recognizing these many factors, water quality in the Eightmile River Watershed can be described as follows:

- 92% of all of the Eightmile's rivers and streams and 99% of all the watershed's ground water meets the State of Connecticut Class A water quality classifications or better.
- Due to the chemical, physical and biological conditions of the water, all waterbodies in the watershed evaluated by the state fully meet their water quality use goals.
- None of the water bodies in the watershed are impaired from meeting their water quality use goals.
- Studies of the aquatic insects (benthic macroinvertebrates) within the watershed found conditions that represent the best attainable results when compared to any of the state's reference stream sites.
- There are no wastewater or industrial surface point source discharges in the watershed.
- Impervious cover in 58% of Eightmile River Watershed's subwatersheds is under 3%, with 99.7% of the subwatersheds having less than 7% impervious cover.
- Riparian corridors are essentially intact and continuous, with only 6% of the riparian land considered developed, and 25% permanently protected, within 100 feet of rivers and streams in the watershed.
- A natural hydrology and flow regime exists.
- 80% of the watershed is forested with less than 7% developed
- There are no subsurface discharges impairing water quality.



Eightmile invertebrate sampling. Photo courtesy of CRCCD.

This substantial amount of information represents data that provides direct indication of high water quality, as well as data that underscores the pristine condition in which this river system exists, remaining relatively free from water quality threats. As such it is clear the water quality of the Eightmile River Watershed is exemplary in the State of Connecticut and an outstanding resource value for the watershed ecosystem.

A complete report on water quality can be found in **Appendix 1 – Outstanding Resource Value – Water Quality**.

See Map 17: **Water Quality**

2. How Water Quality is Threatened

Surface and ground water quality can be impacted in many ways. Land use near a river has a significant impact on water quality. Forest land, farm land, residential land and industrialized land, all have the potential to impact local water quality in different ways through generating point and nonpoint pollution sources. The physical condition of the stream and whether it is dammed, diverted, or piped underground can play a key role in long-term water quality. And, pollutants such as mercury or nitrogen can be carried through the air, over the land, or through the soil ultimately being deposited in local water ways.

An assessment of water quality threats in the Eightmile River Watershed identified 19 potential activities that could cause water conditions to degrade. The greatest threats identified come from the possible impacts of new development including: increases in impervious cover causing increased polluted stormwater runoff; installation of poor stormwater management systems; destruction of riparian vegetation that buffers river and stream edges; and new suburban lawns creating polluted runoff from fertilizer and pesticide applications. In addition, the altering or filling of streams and wetlands, especially in headwater areas was also identified as a significant threat.

3. Existing Protections and Gaps

In order to understand potential additional protection needs for water quality a comprehensive review was completed of current protection measures planned and implemented at the local, state and federal level.

Some of the key existing protections for water quality at the local, state and federal level include:

- Regulations for managing activities occurring in wetlands and watercourses, including local inland wetlands and watercourse regulations and the Clean Water Act Section 404 program implemented by the Army Corps of Engineers.
- Requirements for erosion and sedimentation control for activities that could impact wetlands and watercourses. The Connecticut General Statutes Sections 8-2 and 8-25 authorize the zoning commission to adopt regulations that require erosion and sedimentation control plans for disturbances greater than 1/2 acre in size.
- One community, East Haddam, uses the most current best management practices for the design and installation of new stormwater management systems by following the Connecticut Dept. of Environmental Protection Stormwater Quality Manual.
- All three communities have inland wetland upland review areas that provide some oversight regarding activities within riparian corridors; however they do not directly regulate activities that affect riparian corridor functions.
- Lyme has adopted setback standards in their zoning regulations that protect riparian functions in the Gateway Zone , including Hamburg Cove. The regulations call for no vegetative cutting within 50 feet of the high tide line and no structures within 100 feet.
- 28% of the entire watershed is permanently protected open space as well as 25% of the land within 300 feet of the rivers and streams of the watershed.

Current local, state and federal programs apply various regulatory and non-regulatory tools to address water quality threats. Some threats are being adequately addressed through existing mechanisms, while others are not being directly addressed in any meaningful way. While it is clear the local communities have implemented a number of critical tools to help protect overall watershed health, a number of potential additional tools have been identified that could further advance the protection and enhancement of water quality. These additional tools are discussed later in this section.

Gaps in protection were identified as a result of comparing known water quality threats with existing protection measures. Primary gaps in protecting water quality were found to be associated with:

- riparian corridor protection
- stormwater design and management
- watercourse crossing design
- stormwater management associated with local and state roadways
- aquifer protection – including areas not currently associated with public drinking water supply
- septic system maintenance
- residential underground storage tank removal
- agricultural practices that are exempt from review or oversight by local commissions
- public education regarding nonpoint source pollution for landowners
- gravel extraction regulations in each community do not address the water quality impacts of potential graveling operations

4. Water Quality Protection Goal

The water quality goal for the Eightmile River Watershed is to understand, maintain and enhance the chemical, physical and biological quality of the surface and ground water of the Eightmile River Watershed, ensuring it always supports the needs of native wildlife, aquatic life, and traditional recreational uses.

5. Water Quality Indicators

- a. Riparian Corridor condition
- b. Impervious Cover
- c. Point Source Pollution Discharges
- d. Natural Flow Characteristics
- e. Chemical, Physical & Biological Characteristics
- f. Non-point Source Pollution Discharges
- g. Intact Natural Processes

6. Recommended Indicator Goals and Tools

6.1 Riparian Corridor Condition

Goal

- a. Sustain a minimum of 90% natural forest and/or shrub cover with underlying herbaceous vegetation within 100' of the edge of all perennial watercourses in the Eightmile Watershed.
- b. The repair or replacement of existing watercourse crossings should meet state-of-the-art best management practices associated with both construction and long-term functionality where prudent and feasible as established by the relevant municipal, state and/or federal agency such as the U.S. Army Corps of Engineers.
- c. 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.

Recommended Tier One Tools

- a. *Local Municipal P&Z* – Each community adopts a River Protection Overlay Area for all perennial streams and rivers in the Eightmile River Watershed that provides a 50 foot protection area from the edge of small headwater streams, and a 100 foot protection area from the edge of larger streams. The proposed overlay area is flexible, respecting pre-existing uses and providing for uses within the overlay area consistent with protection of riparian corridor function. See Chapter VII Tier One Management Tool Recommendations Part A. Riparian Corridor Protection for more details on this tool recommendation or *Appendix 9 – Tier One Tools Recommendation Details for a summary of a proposed Model River Protection Overlay Area*.
- b. *Local Municipal P&Z and IWC* – Each community adopts the University of Massachusetts River and Stream Crossing Standards: Technical Guidelines, August 6, 2004. **See Appendix 9 – Tier One Tools Recommendation Details for guidelines.**
- c. *Local Municipal Open Space Commissions and Land Trusts* – Prioritize land conservation efforts that protect riparian corridors. See Chapter VII Tier One Management Tool Recommendations Part E. Eightmile Watershed Land Protection Program for details.

Recommended Tier Two Tools

- a. *Local Municipal P&Z and Open Space Commission* – Incorporate riparian areas as a priority in open space planning and acquisition activities, as well as when identifying open space set aside in new subdivision applications.
- b. *Eightmile River Wild & Scenic Committee, Local Municipal P&Z* – Implement landowner education and outreach initiatives on the importance of riparian areas.
- c. *Local Municipal P&Z* – Establish and implement clear regulations regarding timber management activities. Lyme and East Haddam already have timber management regulations in place. In these cases review current regulations and determine if any changes would be beneficial to protection of the riparian corridor.

- d. *Local Municipal P&Z* – Establish landscaping requirements that incorporate riparian area protection.
- e. *Local Municipal DPW & CT DOT* – Implement municipal and state road construction and maintenance standards that protect riparian area function.

6.2 Impervious Cover

Goal

As per Hydrology Sec. 6.1 Impervious Cover Goals – establish desired impervious surface limits for local basins and Eightmile Watershed.

Recommended Tier One Tools

See Hydrology Sec. 6.1 Impervious Cover Tier One Tools. – adopt impervious surface limit targets, model existing and potential future impervious levels, adopt tools to manage increases in impervious cover, support land conservation as potential tool.

Recommended Tier Two Tools

See Hydrology Sec. 6.1 Impervious Cover Tier Two Tools. – consider use of conservation subdivision design, pursue open space conservation to protect important aquifer areas, implement public outreach campaign regarding the impacts of impervious cover.

6.3 Point Source Pollution Discharges

Goal

Maintain no new wastewater or industrial point source discharges that would cause an increase in the pollutant load to the watershed.

Recommended Tier One Tools

- a. *CT DEP* – Make a formal determination on whether the waters of the Eightmile River Watershed are considered “high quality” surface waters consistent with the state Water Quality Standards.
- b. *Eightmile River Wild & Scenic Committee* – Work to achieve Class A designations for all Class B waters in the watershed. (Note: It is anticipated that this will not require a change in actual water quality conditions but rather an administrative determination, as the current Class B designation is not due to any known impairments to water quality but rather the potential for an impairment from the Salem Landfill.)

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee* – Work to achieve Outstanding National Resource Water designation as described in the CT Water Quality Standards for all the waters of the Eightmile River Watershed.

6.4 Natural Flow Characteristics

Goal

As per Hydrology Sec. 6.7 Natural Stream Flow and Groundwater Level Conditions
Goal – Complete instream flow and hydrologic studies to establish flow criteria for the watershed.

Recommended Tier One Tools

- a. See Hydrology Sec. 6.3 Surface and Groundwater Diversions Tier One Tools – Completing necessary instream flow and hydrologic modeling in order to establish target flow levels and an ability to predict hydrologic changes based upon changes in land use.

Recommended Tier Two Tools

- a. See Hydrology Sec. 6.7 Natural Stream Flow and Groundwater Level Conditions Tier Two Tools – establish stream gage and groundwater monitoring wells, provide hydrologic data to land use commissions to support their decision making processes.

6.5 Chemical, Physical and Biological Characteristics

Goal

Chemical, Physical and Biological Parameters are to meet state Class A water quality criteria. If current conditions already exceed Class A standards the standard is to sustain the higher quality conditions. Water Quality criteria to be considered, but not limited to, include:

- Benthic macroinvertebrate community
- Turbidity
- Dissolved Oxygen
- Suspended and Settleable Solids
- Silt or Sand Deposits
- Odor
- Aesthetics

Recommended Tier One Tools

- a. *Eightmile Wild & Scenic Committee* – Implement a comprehensive water quality testing program to monitor water quality parameters as described above. The purpose of the monitoring will be to establish an ongoing ability to assess water quality conditions and trends over time.
- b. *All* – See criteria and tier one tools associated with Water Quality including Sec. 6.1 Riparian Corridor Condition, Sec 6.2 Impervious Cover, Sec 6.3 Point Source Discharges and Sec. 6.6 Non-point Source Pollution Discharges.

Recommended Tier Two Tools

- a. *All* – See criteria and tier two tools associated with Water Quality including Sec 6.1 Riparian Corridor Condition, Sec 6.2 Impervious Cover, Sec 6.3 Point Source Discharges and Sec 6.6 Non-point Source Pollution Discharges.

6.6 Non-point Source Pollution Discharges

Goal

- a. Minimize new sources of non-point source pollution that may derive from suburban lawns, poorly implemented agricultural and forestry practices, water course crossings and road runoff by maintaining no more than a 10% increase over existing conditions in the acreage of non-point source pollution land uses within the Eightmile River Watershed.
- b. Mitigate sources of existing non-point source pollution to ensure no degradation of existing water quality.

Recommended Tier One Tools

- a. See Water Quality Sec. 6.1 above. Riparian Corridor Condition Tier One Tools – establish river protection overlay zone, adopt water course crossing standards and prioritize land conservation efforts to conserve riparian corridors.
- b. *Local Municipal P&Z and IWC* – Require the CT DEP Stormwater Quality Manual, which is a non-regulatory guidance document, be used as the best management approach for the design, implementation and maintenance of all new and exiting stormwater systems in each community.
- c. *Local Municipal P&Z and Department of Public Works* – Complete and implement a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. See **Appendix 9** for "General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems – Section 6. Development of Stormwater Management Plan" for guidance on the development of the plan.

Recommended Tier Two Tools

- a. *Local Municipal P&Z and IWC* – Establish suburban lawn and landscape best management recommendations including minimization of lawn size, use of native/non-invasive vegetation and Integrated Pest management, that supports elimination of fertilizer and pesticide impacts to water quality
- b. *Eightmile Wild & Scenic Committee* – Implement landowner education and outreach initiatives regarding best management practices for lawns and landscaping related to minimizing non-point source pollution.
- c. *Local Municipal P&Z* – Establish or update regulations to the extent allowed by state statute to minimize non-point source pollution associated with timber management activities
- d. *Local Municipal DPW & CT DOT* – Promote municipal and state road construction and maintenance best management practices if not already in place, including salt and sand practices that minimize non-point source pollution. It is recognized that the state Dept. of Transportation presently has a draft stormwater management plan the meets the requirements of the CT DEP Phase II stormwater management MS4 general permit.

- e. *Eightmile Wild & Scenic Committee* – Support and promote household hazardous waste collection to minimize potential sources of non-point source pollution.
- f. *Local Municipal P&Z* – Adopt local aquifer protection regulations to protect water quality in groundwater aquifer systems. While the Eightmile River Watershed has no aquifers that fall under state aquifer protection requirements as public water supply sources, virtually all the residents of the watershed get their drinking water from groundwater sources through their own individual wells. The purpose of this recommendation is to support protection of all aquifers important to overall public health and watershed well-being.
- g. *Local Municipal P&Z* – Establish septic system maintenance regulation consistent with the requirements of state statute.
- h. *Local Municipal P&Z* – Establish Residential Underground Storage Tank Removal Regulation
- i. *Local Municipal Selectman* – Ensure adequate town staffing for monitoring the implementation of erosion and sedimentation controls. Emphasize the importance of not unnecessarily disturbing, harvesting or importing soils.
- j. *Local Municipal P&Z* – Establish and enforce slope limitations for all new construction to minimize potential erosion and sedimentation issues.
- k. *Local Municipal P&Z* – Promote best management practices from an agency such as the U.S. Dept. of Agriculture's Natural Resource Conservation Service, for agricultural land uses that prevent non-point source pollution
- l. *Eightmile Wild & Scenic Committee* – Promote use of U.S. Dept. of Agriculture's Natural Resource Conservation Service programs such as the Environmental Quality Incentive program (EQUIP) and the Farm and Ranch Land Protection program (FRPP).
- m. *Local Municipal P&Z and IWC* – Consider the potential water quality affects of activities allowed under the state agricultural exemption and determine potential strategies to minimize water quality degradation from such impacts.



Beautiful close up. Photo courtesy of L. Reitz.

6.7 Intact Natural Processes

Goal

Maintain existing energy regime and organic matter inputs using indicator goals for the following ORVs:

- Hydrology
 - Sec. 6.1 Impervious Cover.
 - Sec. 6.2 Dams & Flow Manipulation.
 - Sec. 6.4 Riparian Corridor Condition.
- Unique Species & Natural Communities
 - Sec. 6.4 Presence of Large Intact Habitat Blocks.
 - Sec. 6.6 Aquatic and Upland Habitat.

Recommended Tier One Tools

Utilize above referenced sections of Hydrology and Unique Species and Natural Community ORVs for recommended tier one tools.

Recommended Tier Two Tools

Utilize above referenced sections of Hydrology and Unique Species and Natural Community ORVs for recommended tier two tools.



Eightmile River below Moulsons Pond. Photo courtesy of N. Frohling.

C. UNIQUE SPECIES AND NATURAL COMMUNITIES

1. Outstanding Resource Value

The rarity, diversity and abundance of species and natural communities in the Eightmile River Watershed tell a significant amount about the quality of the watershed ecosystem and its biological diversity. The size and quality of habitat, along with the physical, biological, chemical and hydrologic conditions of the water all interrelate with and influence the species and communities that are found in the Watershed. The species and communities, whether rare or common, are important to overall ecosystem function. From insects to birds to mammals they all play a role in ecosystem health and their presence or absence can cause significant effects to overall ecosystem quality.

A number of different research analyses were completed over the course of the Study to understand the species and natural communities of the Eightmile River Watershed. All were led by William H. Moorhead. A summary of his findings and reports follows.

A three week field survey of the botany and natural communities in the watershed performed by Moorhead, in the summer of 2003 approximately doubled the number of extant occurrences of state-listed rare plants known in the Eightmile watershed, bringing the total of known extant State-listed plant occurrences in the watershed to 54 occurrences. Eleven of these species are also New England regional rare species, and several of these occurrences are of regional significance.

Moorhead also surveyed for natural communities and reported that approximately 100 occurrences of natural communities in the watershed were "significant". Communities were deemed significant on the basis of rarity, uncommonness or restricted occurrence (factoring in threats, and rate and magnitude of decline over the last century), high native-species-richness (often including multiple rare and uncommon plant species), and/or exemplary character and/or condition (especially with respect to relative prominence of exotic and/or invasive species). Eighteen of the communities were ranked as being exemplary for biodiversity significance.

Potentially the most important biodiversity features of the Eightmile River watershed are the extensive meta-occurrence of so-called "warm-season" grasslands, which include, more frequently, little bluestem dominated grasslands, and, less frequently, big bluestem dominated "prairies". These dry to seasonally wet/dry grasslands, which require periodic anthropogenic disturbance (fire or mowing) to persist as open-canopy communities, represent among other things an important reservoir of native genotypes of grass species whose seeds of non-local origin are purchased and planted at considerable expense by land managers in efforts to create warm-season grassland habitat around New England. There appears to be a strong positive correlation between the occurrence and prominence of the tall-grass prairie species and the occurrence of rare and uncommon herbaceous species, and a similar, but somewhat weaker, positive correlation between little bluestem dominated grasslands and the occurrence of rare and uncommon herbaceous species.

The quantity of “at-risk” plant and animal species known from the Eightmile River watershed is substantial. A summary of species considered to be “rare”, “threatened”, or “endangered”, in a state, regional, and/or global context, and species that have been identified by various organizations as of special concern for conservation, due to documented declines and threats, such as loss of habitat, shows a total of 155 such species in the watershed. This list is comprised of 32 vascular plants, 6 amphibians, 81 bird species, 8 fish species, 12 invertebrate species, 7 reptiles and turtles, and 9 mammals.

In addition to the information provided above, there are several ways in which the regional biodiversity significance of the Eightmile River Watershed may be assessed. One way is to compare the number of rare species found in the Eightmile to other watersheds of comparable scale in the region. Toward this end, in late 2004, Natureserve.org was commissioned by the Eightmile River Wild & Scenic Study Committee to create a tally of extant rare species for all of the drainage basins of similar size in New England. This analysis was a first of its kind in New England.

The Eightmile River main stem watershed, a sub-watershed of the entire Eightmile River Watershed, ranks among New England regional and sub-regional basins as having one of the highest concentrations of extant rare species. When the Eightmile mainstem watershed is ranked among the 417 New England regional basins in terms of number of extant rare species per unit basin area, it ranks in the 96th percentile in terms of extant total rare species/unit basin area, and in the 99th percentile, in terms of extant globally rare species/unit basin area. Other analyses of the Eightmile mainstem basin found similar results.

Overall the combination of species and natural communities offer the rarity, abundance and diversity that support a biologically diverse Eightmile River Watershed ecosystem. This combination is something that is clearly unique and exemplary not only within Connecticut but throughout New England, and as such qualifies as an outstanding resource value for the Eightmile River Watershed.

Two reports on the unique species and natural communities of the Eightmile River Watershed can be found in **Appendix 4: Outstanding Resource Value Report and Unique Species and Natural Communities** and **Appendix 6: Outstanding Resource Value Report – The Watershed Ecosystem**.

See Map 4: **Habitat Diversity** and
Map 5: **Rare Species Areas and Significant Natural Communities**



Scutellaria inegrifolia in Lyme.
Photo courtesy of W Moorehead.

2. How Unique Species and Natural Communities are Threatened

An analysis of potential threats to the species and natural communities of the Eightmile River Watershed identified 16 activities that could significantly degrade this outstanding resource value. Most of the threats identified to potentially impact the quality of unique species and natural communities were ranked as "highly likely" for causing an impact making this outstanding resource value the most vulnerable of all to degradation, with water quality and the watershed ecosystem close behind.

As with other outstanding resource values, impacts from development activities were identified as a major source of potential degradation. Activities including increases in impervious surfaces, the spread of suburban lawns, degrading riparian corridors, altering or filling small streams and wetlands, and fragmentation of habitat caused by new development activity all have great potential to impact the diversity, rarity and abundance of unique species and natural communities in the Eightmile River Watershed.

The large unfragmented blocks of land, from 500 to over 2,500 acres in size, are a critically important asset for the Eightmile River Watershed. Habitat fragmentation occurs when a large region of habitat has been split into a collection of smaller patches. This happens typically when land is converted from one type of use to another. For example, a forest habitat may become fragmented when a road is built across it. The road divides the single large continuous patch of forest into two smaller disconnected patches.

Fragmentation can cause, among other things: a reduction of total habitat area; vulnerability for species forced to migrate to other habitat patches; the isolation of populations leading to a decline in population size and quality; and edge effects altering habitat, species composition, microclimates, and vulnerability to predation.

Invasive species are another substantial threat to the abundance, diversity and rarity of species and communities currently in the Eightmile River Watershed. Species such as purple loosestrife, multiflora rose, phragmites and Japanese barberry, which already dominate in certain areas, have the potential to cause significant degradation of species and natural community habitat if not managed appropriately. Also, water chestnut, a very aggressive aquatic invasive plant was discovered in Hamburg Cove. Water chestnut like other aquatic invasive plants has the potential to infest waterbodies and critical environmental habitats. The single plant that was found was removed, however water chestnut seed may be able to produce new plants for up to 12 years. Deer were also identified as a nuisance species that are causing significant damage to plants and trees across the watershed.

3. Existing Protections and Gaps

In order to understand potential additional protection needs for unique species and natural communities a comprehensive review was completed of current protection measures planned and implemented at the local, state and federal level.

Some of the key protection tools currently in place include:

- Each community has local inland wetland regulations, including upland review areas, to protect wetland functions and values.
- Open space planning and acquisition is occurring, especially in Lyme, to help prevent habitat fragmentation and protect important habitats.

- East Haddam requires conservation subdivision design that calls for identifying wildlife habitats and state-listed rare species.
- East Haddam inland wetland regulations include a 400-foot review area around vernal pools.
- East Haddam requires new stormwater systems to be designed following the state stormwater quality manual.
- Net buildable area calculations are required for determining lot density of subdivisions for all three towns, supporting areas more suitable for building and protecting areas more sensitive to development.
- The State endangered species act helps protect state threatened and endangered species associated with state funded, conducted or permitted projects.
- The Gateway Zone in Lyme includes protection of riparian areas through a zoning setback requirement of 50 feet for no vegetative cutting and 100 for no structures.
- The Eightmile River is an officially-designated state greenway.

Gaps in protection were identified as a result of comparing known threats to unique species and natural communities with existing protection measures. Primary gaps in protecting unique species and natural communities were found to be associated with:

- New as of right agricultural uses affecting wetlands and watercourses
- Suburban lawns
- A lack of current and comprehensive unique species and natural community information
- Watercourse crossings
- Regulating timber cutting operations
- Limited powers of state endangered species act
- Assessment and control of invasive species
- Limitation of public and private funds for protecting key parcels of land
- The impact of poorly planned development affecting intact habitat areas and causing habitat fragmentation

4. Unique Species and Natural Communities Protection Goal

The unique species and natural communities goal for the Eightmile River Watershed is to recognize and protect the unique, rare, declining and common plants, animals and natural communities of the Eightmile River Watershed that are vital to the area's rich biodiversity.

5. Unique Species and Natural Communities Indicators

- a. Species and Natural Community Rarity
- b. Species and Natural Community Diversity
- c. Species and Natural Community Abundance
- d. Presence of large, contiguous habitat blocks
- e. Natural Hydrology and Unimpaired Water Quality
- f. Aquatic and Upland Habitat Connectivity
- g. Natural Cover
- h. Invasive Nuisance Species

6. Recommended Indicator Goals and Tools

6.1 Species and Natural Community Rarity

Goal

Maintain and enhance the existence within the Watershed of all rare species and communities.

Recommended Tier One Tools

- a. See Water Quality Sec. 6.1 – Riparian Corridor Condition Tier One Tools – establish a River Protection Overlay Zone, adopt watercourse crossing design guidance, and recognize riparian corridors as priority land conservation areas.
- b. See Hydrology Sec. 6.1 Impervious Cover Tier One Tools. – adopt impervious surface limit targets, model existing and potential future impervious levels, adopt tools to manage increases in impervious cover, support land conservation as potential tool.
- c. See Unique Species and Natural Communities Sec 6.4 below – *Presence of Large Intact Habitat Blocks*
- d. See Water Quality Sec. 6.6 Non-point Source Pollution Discharges Tier One Tools – riparian corridor protection, municipalities adopt CT DEP Stormwater Quality Manual, municipalities complete municipal stormwater management plan.
- e. See Unique Species and Natural Communities Sec. 6.8 below – *Invasive Nuisance Species*

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee* – complete a comprehensive assessment and mapping of all rare species and communities within the Eightmile River Watershed. Establish a set of indicator species representing rare and potentially declining common species and natural communities throughout the watershed as discussed in sec. 6.2 below.
- b. *Eightmile River Wild & Scenic Committee* – offer local towns technical support regarding the protection and management of rare species and communities
- c. *Eightmile River Wild & Scenic Committee* – Establish a monitoring program to assess change in the abundance, rarity and diversity of species and natural communities in the Eightmile River Watershed using the indicator species defined in item C.1 above.
- d. *Local Municipal P&Z* – Adopt conservation subdivision design standards to support conservation of known rare species and communities.
- e. *Local Conservation Commission* – Complete natural resource inventory for the community.

6.2 Species and Natural Community Diversity

Goal

Establish a subset of rare and potentially declining common species and natural communities to be used as indicators of overall diversity. Maintain and enhance the existence within the Watershed of all indicators. The indicators will include:

- Keystone species where possible;
- Species and natural communities that are statistically and ecologically sufficient to represent overall diversity, including:
- Aquatic species and natural communities
- Riparian species and natural communities
- Upland species and natural communities

Recommended Tier One Tools

See Sec 6.1 Species and Natural Community Rarity Tier One Tools above.

Recommended Tier Two Tools

See Sec 6.1 Species and Natural Community Rarity Tier Two Tools above .

6.3 Species and Natural Community Abundance

Goal

Maintain and enhance the existing level of abundance of indicators as identified in Sec. 6.2 Species and Natural Community Diversity above.

Recommended Tier One Tools

See Sec. 6.1 Species and Natural Community Rarity Tier One Tools above

Recommended Tier Two Tools

See Sec. 6.1 Species and Natural Community Rarity Tier Two Tools above.

6.4 Presence of Large Intact Habitat Blocks

Goals

- a. Maintain 80% or more unfragmented acreage of all identified blocks. (See **Appendix 14 – Eightmile River Watershed Project Land Resources Inventory and data Analysis document** and Map 7 Eightmile River Watershed Unfragmented Areas) Maintain 90% or more for priority blocks and/or a minimum of 3,000 acres where possible to support interior nesting birds.
- b. No new roads, power lines, or other fragmenting infrastructure which completely divides any priority block (Blocks 1 through 7 and 9 of the 16 blocks identified in the above referenced map) into two or more blocks. Exceptions for instances where fragmented areas of up to 5 acres occur.
- c. Maintain all natural, native vegetative cover within habitat blocks that is greater than 500 feet from the existing block borders. For priority blocks, maintain all natural native vegetative cover within the blocks that is greater than 250' from the existing borders. Activities within the 500/250 foot areas should be compatible with sustaining existing habitat block functions.

Recommended Tier One Tools

- a. *Local Municipal Open Space and Conservation Commissions* – Endorse the remaining unfragmented habitat blocks as high priority open space conservation areas through pertinent town planning documents such as the Town Plan of Conservation and Development and the Town Open Space Plan.
- b. *Local Municipal Open Space and Conservation Commissions* – Establish a land protection goal for each community and the watershed as a whole. See Land Protection Program in Chapter VII Tier One Management Tool Recommendations Part E. Eightmile Watershed Land Protection Program for details.
- c. *Local Municipal Open Space and Conservation Commissions* – Commit to working with other partners, such as local land trusts, the Nature Conservancy and the State to leverage resources and collaborate when opportunities arise to protect priority lands. See Land Protection Program Chapter VII Tier One Management Tool Recommendations Part E. Eightmile Watershed Land Protection Program for details.
- d. *Local Municipal Open Space and Conservation Commission* – Endorse support for federal funding assistance to help support such open space conservation actions. While the federal government will not own or manage any land associated with a Wild & Scenic designation, a designation may create an opportunity to access federal funds that local agencies could use to support open space conservation. Clearly stating such an interest in the Management Plan will be helpful in pursuing such funding resources. See Land Protection Program Chapter VII Tier One Management Tool Recommendations Part E. Eightmile Watershed Land Protection Program for details.

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee* – Establish an up-to-date and comprehensive map of unfragmented habitat blocks.
- b. *Eightmile River Wild & Scenic Committee* – Establish an ability to monitor changes in habitat block size.
- c. *Eightmile River Wild & Scenic Committee* – Work with local land use commissions to provide up-to-date information on habitat blocks, especially priority blocks, and the status of changes in block sizes.
- d. *Local Municipal P&Z* – Adopt conservation subdivision design standards to support conservation of important habitat blocks.
- e. *State Dept. of Environmental Protection, Eightmile River Wild & Scenic Study Committee* – Work together with CT DEP to identify opportunities to implement pertinent component's of Connecticut's Comprehensive Wildlife Conservation Strategy in the Eightmile River Watershed.
- f. *Eightmile River Wild & Scenic Committee* – work with USDA Natural Resources Conservation Service to identify opportunities to leverage funding and technical resources from NRCS wildlife programs such as the Wildlife Habitat Enhancement Program (WHIP), the Environmental Quality Incentives Program (EQIP), as well as the CT DEP Landowner Incentive Program (LIP).

6.5 Natural Hydrology and Unimpaired Water Quality (Consistent with Watershed Hydrology Sec. 6.6).

Goal

See all the Goals supporting the Watershed Hydrology ORV

Recommended Tier One Tools

See all the Tier One Tools supporting the Watershed Hydrology ORV.

Recommended Tier Two Tools

See all the Tier Two tools supporting the Watershed Hydrology ORV.

6.6 Aquatic and Upland Habitat Connectivity

Goal

- a. Avoid, minimize or mitigate new river crossings on second order or larger streams in the Watershed to the maximum extent possible. Minimize additional river crossings on first order streams. Follow best management practices for aquatic life support, water quality and stream flow if a new crossing or reconstruction of an existing crossing must occur.
- b. As per Hydrology ORV, Sec. 6.2 Dams and Flow Manipulation, Goal a. – , no new dams, especially on second order or larger streams within the Watershed.
- c. As per Hydrology ORV, Sec. 6.2 Dams and Flow Manipulation, Goal c. As per Hydrology ORV (Sec 2. c.) – remove certain man-made dams.
- d. See Unique Species Sec. 6.4 above “Presence of Large, Intact Habitat Blocks” criteria for upland connectivity.
- e. Restore 90% of the connectivity throughout the watershed of instream aquatic habitats as well as aquatic/upland habitat relationships.
- f. Maintain connectivity between aquatic and upland habitats for all wetlands and perennial streams in the watershed. Specifically sustain at least a 90% open connection between upland areas and each wetland or perennial stream boundary.
- g. Sustain a minimum of 95% natural vegetative cover within the 200' riparian zone for all wetlands and watercourses in the overall watershed comprised of forest and underlying herbaceous vegetation and/or native shrub or naturalized grassland.



Harris Brook in the spring. Photo courtesy of L. Reitz.

Recommended Tier One Tools

- a. *Local Municipal P&Z and IWC and the State DOT* – Adopt The University of Massachusetts guidance for watercourse crossings, an approach that is used by Army Corps of Engineers (New England Region). See **Appendix 9 – Tier One Tools Recommendations** for a copy of the “Massachusetts River and Stream Crossing Standards: Technical Guidelines”.
- b. See Water Quality Sec. 6.1. – Riparian Corridor Condition Tier One Tools – establish a River Protection Overlay Zone, adopt watercourse crossing design guidance, and recognize riparian corridors as priority land conservation areas.
- c. See Unique Species and Natural Communities Sec. 6.4 Tier One Tools above – Presence of Large Intact Habitat Blocks

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee* – Survey all watercourse crossings in the watershed to determine quality of connectivity. Establish a prioritized list of connectivity needs within the watershed. Work with local communities and the state to restore connectivity where practical and feasible.

6.7 Natural Cover

Goal

See Watershed Hydrology Sec. 6.5 Watershed Forest and Vegetative Cover Goal – sustain a minimum of 75% forest cover and 90% natural, native vegetative cover within the Watershed.

Recommended Tier One Tools

See Water Quality Sec. 6.1.– Riparian Corridor Condition Tier One Tools – establish a River Protection Overlay Zone, adopt watercourse crossing design guidance, and recognize riparian corridors as priority land conservation areas.

Recommended Tier Two Tools

See Watershed Hydrology Sec. 6.5 Watershed Forest and Vegetative Cover Tier Two Tools item c – develop a scope of work and implement an invasive species reconnaissance and removal program.

6.8 Invasive Nuisance Species

Goals

- a. Prevent, or remove if discovered, invasions of serious non-native nuisance species such as Zebra mussel and Water chestnut; identify others as appropriate.
- b. Have 0% increase in invasives in areas identified as being in pristine condition.
- c. Where feasible restore areas that have been degraded by invasive species.
- d. Where restoration is not feasible allow no net increase in invasive area coverage.
- e. Limit deer to no more than 25 per square mile within the Watershed. (Note: CT DEP 2003 estimates show approximately 21 deer per square mile in Lyme and East Haddam with pockets of higher density. DEP goal is to not exceed 25 per square mile).

Recommended Tier One Tools - None**Recommended Tier Two Tools**

- a. *Eightmile River Wild & Scenic Committee* – Complete a detailed inventory of invasive species in the Eightmile River Watershed.
- b. *Eightmile River Wild & Scenic Committee* – Create and implement an Invasive Species management plan following the goals established above.
- c. *Local Municipal P&Z* – Implement appropriate regulations that require all landscaping, planting, and ground-cover materials to be non-invasive species and prohibit all non-native invasive species from being used in any new activity.

6.9 Intact Natural Processes**Goal**

Maintain existing biotic interactions including population, structure and composition, and recruitment: See Sections 4, 5 and 6 above for related goals.

Recommended Tier One Tools

See Unique Species and Natural Communities Sections 6.4, .5 and .6 Tier One Tools above.

Recommended Tier Two Tools

See Unique Species and Natural Communities Sections 6.4, .5 and .6 Tier Two Tools above.



Slow waters of the Eightmile River. Photo by D. Bingham.

D. GEOLOGY

1. The Unique Geology of the Eightmile River Watershed

Many aspects of the geology in the Eightmile River Watershed stand out as being regionally and locally significant. Following is a summary of the components of the geologic features of the Eightmile River Watershed which make geology stand out as an outstanding resource value. A glossary of select terms is provided for your convenience.

An Exceptional Assemblage of Bedrock

Bedrock is the solid rock that underlies soil or other unconsolidated surface material. In 1966, Lundgren described the bedrock of the Eightmile River Watershed as "an exceptionally varied suite of rocks that includes representatives of nearly all of the major stratigraphic and granitic units known in eastern Connecticut."

The exceptional variation in the Eightmile's bedrock assemblage has its origin in New England's plate tectonic history. This history includes the closing of the Iapetus Ocean between 480 and 250 million years ago when the African and North American tectonic plates converged and ultimately collided. Eleven bedrock units representing the remnants of the Iapetus Ocean were crushed together with units once part of western Morocco (North Africa). Heating and metamorphism then formed what is now the bedrock foundation of the Eightmile River Watershed.

For most of New England the closing of the Iapetus Ocean resulted in a general north-south alignment of terrane boundaries and their attendant bedrock units. This is not the case for a small area of Southeastern Connecticut, including the Eightmile. In this region, a small crinkle in the bedrock fabric produced an anomalous east-west alignment. As a result, rocks from two major players in the New England-wide plate tectonic history are found in the watershed. The east-west trending Honey Hill fault is a terrane boundary that delineates the contact of oceanic affinity Iapetus-Terrane bedrock units to the north, and African affinity Avalonian-Terrane bedrock units to the south.

Also unique to the Eightmile is the occurrence of basic or "sweet" soils. Most metamorphic bedrock in Connecticut is acidic, which over time breaks down (weathers) to acidic soil. Five of the eleven metamorphic bedrock units underlying the Eightmile have basic, calc-silicate or marble members. Mapped in the Eightmile near Cedar Lake and at the south end of Moulsons Pond, the basic bedrock members will likely weather to basic soils. These basic soils are ecologically significant to a region generally dominated by acidic soils.

Atypical Local Topography

Stream erosion over the past 250 million years coupled with the erosive power of two known Pleistocene glaciations has sculpted the bedrock surface into New England's rolling, north-south orientated topography. The north-south landscape pattern in Connecticut was caused by selective weathering of less resistant bedrock units as well as north-south aligned fault/fracture zones that developed when rifting formed the Atlantic Ocean. Ridge systems running north-south drained by south-flowing streams are typical throughout most of Southern New England – except for a small area in and around the Eightmile.

The anomalous alignment of bedrock units in the Eightmile creates a series of east-west trending strike ridges (bedrock alignments) which are cut by valleys that mirror the regional pattern of north-south fractures. The result is a rectangular or "blocky" local topography that is uncharacteristic in Connecticut and the region as a whole. The drainage pattern of the Eightmile River and its tributaries reflects the east-west bias of the strike ridges and the north-south bias of the crosscutting fractures.

Glacial Evidence Remains

The pattern of glacial deposition in the Eightmile is similar to other areas of Southern New England that are underlain by metamorphic bedrock. Blanketed by thin till, uplands are punctuated by patches of thicker till, drumlins and bedrock outcrops. Associated with exposed upland bedrock are striations, polished surfaces, roche moutonnée and evidence of relict glacial spillways. The valleys in the Eightmile are filled with stratified drift deposits of sands, gravels and lake/pond deposits left by the last glacier during its northward retreat. Five former ice positions are marked by ice-contact stratified drift deposits that lie in the valley between Hamburg Cove and Route 82. Eskers and Kettles occur in several locations, and there are exemplary examples of these passive ice features in the Pleasant Valley Preserve in Lyme. Open fields just north of Hamburg Cove, in the Pleasant Valley area, and in the North Plains area are nice examples of an "eggs in basket" topography that compelled the Scottish to invent the very popular game of golf.

The watershed's geology plays a critical role in overall watershed quality affecting resources from hydrology to biodiversity to the cultural landscape. The combination of an exceptional assemblage of bedrock, unique atypical local topography and exemplary glacial evidence remains all provide a distinct representation of geology in Connecticut and as such is considered an outstanding resource value for the Eightmile River Watershed.

See Map 6: **Bedrock Geology**

GLOSSARY

ge-ol-o-gy (j - l' - j) n.

The scientific study of the origin, history, and structure of the earth, a specific region of the earth's crust, or the solid matter of a celestial body.

gran-ite (gr n' t) n.

A common, coarse-grained, light-colored, hard igneous rock consisting chiefly of quartz, orthoclase or microcline, and mica, used in monuments and for building.

met-a-mor-phic (m t' -môr'f k) adj.

Changed in structure or composition as a result of metamorphism, a process by which rocks are altered in composition, texture, or internal structure by extreme heat, pressure, and the introduction of new chemical substances.

roche mou-ton-née (rôsh' m t'-n-, m 'tô- n') n.

An elongate mound of bedrock worn smooth and rounded by glacial abrasion.

stra-tig-ra-phy (str -t g'r -f) n.

The study of rock strata, especially the distribution, deposition, and age of sedimentary rocks.

stri-a-tion (str - 'sh n) n.

One of a number of parallel lines or scratches on the surface of a rock that were inscribed by rock fragments embedded in the base of a glacier as it moved across the rock.

tectonic plates (tek-ton-ik) n.

The dozen or so plates that are about 30 miles thick that makes up the surface of the Earth. Their motion is studied in the field of plate tectonics. The plates are not the same as the continents. The North American plate, for example, extends from the middle of the Atlantic Ocean to the west coast of the United States and Canada.

ter-rane also ter-rain (t -r n', t r' n) n.

A series of related rock formations.

2. How Geology is Threatened

An assessment of threats to the geology of the Eightmile River Watershed identified two potential activities that could cause geological quality to degrade. Earth material extraction, such as gravel mining operations or quarrying, was identified as one threat that could alter the bedrock and surficial geological features within the watershed. In addition, the threat of development activities causing changes to the slope and topography of the landscape, including glacial features was also identified (e.g. development activities altering or removing distinct eskers or filling in kettle holes). It should be noted that both of these threats were ranked to have a small potential impact to the overall quality of the features that qualified geology as an outstanding resource value in the watershed.

3. Existing Protections and Gaps

In order to understand potential additional protection needs for geology a comprehensive review was completed of current protection measures planned and implemented at the local, state and federal level.

There were few tools found that would address the threats to geology. They include:

- East Haddam and Lyme do not permit bedrock quarrying.
- All three communities have gravel extraction regulations. Lyme's have just been revised to further minimize impacts caused by gravel extraction operations.
- East Haddam and Salem require new streets to follow natural contours wherever possible.

Gaps in protection were identified as a result of comparing known geology threats with existing protection measures. Primary gaps in protecting geological features include:

- All three towns require net buildable area calculations for determining the number of lots allowed in a new subdivision. While the buildable area calculations require eliminating areas of steep slopes or exposed rock they do not prevent structures or activity from occurring in those areas.
- Slope requirements for restoration of sites after gravel has been removed do exist; however, there is no mention of trying to restore a natural topographic condition.
- Local regulations do not identify glacial features as important to conserve.
- There is no comprehensive summary and map available to towns identifying significant geological features for use in land use and open space planning.

4. Geology Protection Goal

The geology goal for the Eightmile River Watershed is to promote the distinct geology of the Eightmile River Watershed and work to protect the features that best exemplify the area's geologic uniqueness.

5. Geology Indicators

- a. Natural Topographic Condition
- b. Intact Bedrock Geology
- c. Intact Glacial Features

6. Recommended Indicator Goals and Tools

6.1 Natural Topographic Condition

Goal

Maintain natural topographic conditions for any gradients of 20% or more (ratio of vertical distance to horizontal distance).

Recommended Tier One Tools – none

Recommended Tier Two Tools

- a. *Local Municipal P&Z and Eightmile River Wild & Scenic Committee* – Work together to develop accurate slope information for the watershed. With such information identify priority areas for protecting natural topographic features such as ridgelines.
- b. *Local Municipal P&Z* – Adopt clear slope limitations in subdivision regulations that will provide for maintaining natural topographic conditions to the greatest extent feasible.
- c. *Local Municipal P&Z* – Adopt gravel extraction regulations that require site restoration conditions to be consistent with maintaining a natural topographic appearance.
- d. *Local Municipal Open Space Committee* – Identify exceptional topographic features, e.g. ridgelines, as an important conservation priority in open space planning guidance.

6.2 Intact Bedrock Geology

Criteria

All new development activities in the watershed are consistent with protecting the geological features that exemplify the watershed's exceptional assemblage of bedrock types.

Recommended Tier One Tools – none

Recommended Tier Two Tools

- a. *Local Municipal P&Z, Eightmile River Wild & Scenic Committee* – Work together to create an up to date map of exceptional bedrock features within each community to be used in land use decision making and open space planning activities.
- b. *Local Municipal P&Z* – Modify local regulations to recognize the importance of protecting exceptional bedrock features when reviewing applications for activities including gravel extraction and subdivisions.
- c. *Local Municipal Open Space Committee* – Identify exceptional bedrock features as an important conservation priority in open space planning guidance.

6.3 Intact Glacial Features

Criteria

All new development activities in the watershed, including gravel extraction, are consistent with protecting the unique glacial features found in the watershed.

Recommended Tier One Tools – none

Recommended Tier Two Tools

- a. *Local Municipal P&Z, Eightmile River Wild & Scenic Committee* – Work together to create an up to date map of unique glacial features within each community to be used in land use decision making and open space planning activities.
- b. *Local Municipal P&Z* – Modify local regulations to recognize the importance of protecting unique glacial features when reviewing applications for activities including gravel extraction and subdivisions.
- c. *Local Municipal Open Space Committee* – Identify unique glacial features as an important conservation priority in open space planning guidance



The intact landscape of the Eightmile River watershed. Photo courtesy of the Study Committee..

E. THE WATERSHED ECOSYSTEM

1. The Eightmile River Watershed – A Whole Greater Than the Sum of Its Parts

The Eightmile River Watershed ecosystem reflects the sum of the many interacting ecological features found throughout the watershed. The fact that each of these features are generally in excellent condition means that their sum at the ecosystem level is synergistic – “greater than the sum of the parts” - and that an outstanding overall ecosystem is the result. This quality can be summarized by looking at the condition of the Eightmile’s structure, function and landscape context.

Regarding structure, the Eightmile contains all of the critical components of a high quality watershed ecosystem and these components are in excellent condition. These include rare, diverse and abundant species and natural communities, extensive habitat which is intact and connected, limited presence of invasive species, high water quality, stream connectivity throughout most of the watershed, natural channel morphology, and extensive forest and vegetative cover throughout the watershed including riparian areas. Regarding function, the quality of key ecological processes is also excellent. The hydrology of the watershed is as natural and unimpaired as any in Connecticut. Sediment and scour characteristics are natural. Nutrient and energy cycles reflect an undisturbed system. The size of intact habitat and low level of system manipulation allows natural disturbance regimes such as flooding, hurricanes, and ice storms to occur within their natural range of variability where the system can respond and recover naturally.

The landscape context for the Eightmile is very good. Because the ecosystem is the watershed itself, it has by definition sufficient size to incorporate the full range of the system. Furthermore, immediately outside of the Eightmile Watershed, the landscape remains largely intact providing a good buffer for the Eightmile and greater overall ecological integrity. The Connecticut River meets and interacts with the mouth of the Eightmile River by providing generally high quality water during daily tidal cycles.

In short, each of the previous natural resource ORV's (water quality, hydrology, geology, and unique species and natural communities) all contribute to making the watershed ecosystem an outstanding resource value. Below is a more detailed summary of some of the most significant features which make the Eightmile River Watershed ecosystem an Outstanding Resource Value.

Naturally functioning hydrologic system

One over-arching component of a functioning watershed ecosystem is a naturally functioning hydrologic cycle. Un-natural perturbations of a watershed's hydrology include dams, water diversions, stream channel encroachment and channelization, point source and non-point source discharges, and many other human actions. It was determined that the Eightmile River watershed has an essentially natural intact flow, a few minor impediments, a single known consumptive water diversion, the impact of which is currently not known to be significant. In the Eightmile watershed, there are a low percentage of impervious surfaces (3%), a low percentage of developed area, and a high percentage of forested land. These values for these parameters are in the ranges that are correlated empirically with high ground and surface water quality.

High Water Quality

Available chemical and biotic data indicate that surface water quality is high in Eightmile Watershed streams. Biotic data collected by the CT-DEP 1998-1999 indicate "exemplary ecological conditions" for the Eightmile River [mainstem] and very good conditions for the East Branch Eightmile River (Beauchene 2003). In the context of Connecticut, and especially in the context of coastal Connecticut, a high percentage of the watershed is forested. This is undoubtedly the primary reason for the high surface water quality and high ecological integrity of these rivers.

Presence of large unfragmented forest blocks

The high percentage of forested habitat in the Eightmile River is comparable in Connecticut only to watersheds in the northwest corner of Connecticut and the southeast border of Connecticut with Rhode Island, both areas that are recognized as having the highest known biodiversity in New England. Similarly, in a Connecticut context, a low percentage of Eightmile watershed is developed, and it has a low density of roads (2.62 mi/mi^2), and percentage of watershed occupied by large roadless blocks (72% occupied by roadless blocks greater than 1000 ac). All three parameters are strong indicators of the high level of habitat connectivity and intactness. These values are exceeded only by watersheds in the two areas of highest diversity in New England.

A large portion of the Eightmile watershed's forested portion occurs as large, unfragmented blocks (e.g., 33% in blocks greater than 1000 ac, 17% in blocks greater than 500 ac). The Eightmile watershed also comprises the greatest part of a major New England concentration of the Cerulean Warbler, a forest interior species that is considered to be the most area-sensitive bird in North America, and which is experiencing a rapid range wide decline. The high densities of the Cerulean Warbler centered in the Eightmile Watershed are attributed to the combination of the Eightmile watershed's near-coastal (therefore warmer climate) position, its high proportion of large forest blocks, and the type and maturity of its forests. The Cerulean Warbler, besides being identified by multiple conservation organizations as a continental conservation priority, is both an indicator species and an umbrella species in the Eightmile watershed ecosystem. Its high densities indicate that the system has adequate resources, in this case forest blocks of adequate quantity and quality, to support a species with high sensitivity to both parameters. The Cerulean Warbler is an umbrella species in this system, because if habitat quality is such that there are high densities of Cerulean Warblers, we can expect that a large number of other area-sensitive forest species should thrive as well.

Nutrient cycling

Excellent surface water quality is a strong indicator of intact, well-functioning nutrient cycling processes in an ecosystem, and streams in the Eightmile watershed have been shown to meet this criterion.

Level of impairment due to invasive species

One parameter often used to assess ecosystem integrity, function, and stress is the relative abundance of non-native and/or invasive species. Extensive displacement of native species by invasive species, and loss especially of the rarer, more sensitive native species are considered indicators of an impaired, stressed ecosystem. Regarding the relative importance of invasive species in the Eightmile watershed, inadequate scientific data does not permit a rigorous comparison of this watershed to others, but the opinion of many naturalists and scientists familiar with the area is that the Eightmile watershed has relatively low levels of invasive species. Field observations (2003-2005) support this view, especially considering the vast acreage of dry to mesic, relatively acidic forest in the watershed, which is invasive-free or nearly so, and naturally inhospitable to all or most invasive plants. If one uses the presence/abundance of extant rare species as an indicator of ecosystem impairment due to invasives, the Eightmile watershed ecosystem's integrity appears rather high. The density of extant rare species in the Eightmile watershed (.08 sp/mi²) is substantially higher than all other regional watersheds in Connecticut except for those in the northwest corner and along the Rhode Island border that have the highest numbers of rare species in New England. Thus, both subjective professional impressions and data on extant rare species indicate that the Eightmile watershed ecosystem is currently relatively unimpaired by invasives.

Disturbance regimes

Among the many important intact natural disturbance regimes in the Eightmile watershed is the seasonal high flow/low flow cycle, overlain by the lower frequency very high flows associated with catastrophic storms, of the larger streams in the system. The Eightmile streams are free of flood control structures, and the larger streams, especially, have relatively little bank stabilization. Thus, there exist along the streams in abundance various riparian communities that are maintained by and dependent upon periodic flooding and natural scouring. Also, this allows natural changes in channel configuration that produce riparian habitat diversity.

See Map 7: Intact Ecosystem

2. How the Watershed Ecosystem is Threatened

The watershed ecosystem is an intact functioning system because its component parts including the ORVs of water quality, watershed hydrology and unique species and natural communities are of such high quality. Therefore as would be expected, all of the threats that pertain to the above mentioned ORVs would also affect the quality of the watershed ecosystem as a whole. As a result, the assessment of threats to the watershed ecosystem concluded that all of the 24 distinct threats considered in the comprehensive threat analysis exercise would have an impact on the watershed ecosystem.

The highest threats again were found to derive from the impacts of development activities including: impervious surface increases, suburban lawns, habitat fragmentation, poor stormwater management, loss of riparian function, altering or filling of wetlands or watercourses, and habitat fragmentation.

Invasive species was another high ranking threat. A number of invasive plant species are established in the watershed, and a number of these, such as burning bush (*Euonymus alatus*) and autumn olive (*Elaeagnus umbellata*), are considered capable of causing significant degradation of existing intact natural communities within the next 10 years. They may be expected to increase stress on at least certain elements of the Eightmile ecosystem. Among these in particular are the less common and rare habitats that occupy a relatively small portion of the watershed, but harbor a large portion of the biodiversity.

One continually present theme in performing the threat analysis was the need for further information on the location, quality and vulnerability of resources. Such regularly updated information shared with local land use commissions in performing application reviews and land use planning activities is essential for the long-term well-being of the many parts of the watershed ecosystem.

3. Existing Protections and Gaps

As with the threats to the watershed ecosystem the existing protections and gaps associated with protecting the watershed ecosystem is a combination of all that has been identified in previous ORVs.

Some of the key protections currently being employed that are most beneficial to protecting the watershed ecosystem include:

- Open space conservation efforts by local land trusts, towns, the state and The Nature Conservancy.
- Implementation of net buildable area requirements in all three towns for new subdivisions reducing the density of housing and targeting areas most appropriate for new development to occur.
- Inland wetland and watercourse regulatory protections as well upland review areas ensure upland activities are not impacting wetland and watercourse functions and values.
- A 400 foot upland review area around vernal pools in East Haddam.
- Protection of the riparian area for upper and lower Hamburg Cove associated with the Gateway Zone in Lyme.
- Implementation of the State Stormwater Quality Manual in East Haddam.
- Implementation of Conservation Subdivision design in East Haddam.

Gaps in overall watershed ecosystem protection include:

- Lack of riparian corridor protection
- Limited ability to control the growth or impacts of impervious cover
- No comprehensive invasive species inventory or management plan established
- Lack of ongoing biological and ecological inventorying and monitoring
- Lack of management strategy for open and semi-open habitats in the watershed
- Limited resources to purchase open space or conservation easements
- Inconsistent management of stormwater quality among communities

4. The Watershed Ecosystem Protection Goal

To understand, promote and protect a watershed ecosystem that integrates exemplary water quality and hydrologic conditions with high quality, intact and unfragmented wetland, riparian and upland habitats, in order to support diverse and robust populations of native plant, animal and fish species.

5. Watershed Ecosystem Indicators

The indicators for the Watershed Ecosystem are a compilation of all the Indicators for the Hydrology, Water Quality and Unique Species and Natural Communities ORVs identified for the Eightmile River Watershed and include:

- a. Impervious Cover
- b. Dams and Flow Manipulation
- c. Surface and Ground Water Diversions
- d. Riparian Corridor Condition
- e. Forest and Vegetative Cover
- f. Aquifer Storage and Recharge
- g. Channel Morphology
- h. Sediment and Scour Characteristics
- i. Energy Regime/Organic Matter Inputs
- j. Biotic Interactions: Structure, Composition, Recruitment
- k. Species and Natural Community Rarity, Diversity and Abundance
- l. Presence of Large, Contiguous Habitat Blocks
- m. Aquatic and Upland Habitat Connectivity
- n. Nuisance Species
- o. Point Source Pollution Discharges
- p. Non-point Source Pollution Discharges
- q. Chemical, Physical and Biological Characteristics (of Water Quality)



Mosaic of preserved forest and agricultural lands in Salem. Photo courtesy of A. Irving.

6. Recommended Criteria and Tools

The identity of the Watershed Ecosystem is unique relative to the other ORVs and its significance greater than the sum of its component parts. However, the criteria and recommended tools for the hydrology, water quality and unique species ORV's are deemed sufficient to serve as the criteria and recommended tools for the Watershed Ecosystem.



Eightmile River in Devils Hopyard State Park. Photo courtesy of J. Rozum.

F. THE CULTURAL LANDSCAPE

1. Defining a Sense of Place: The Cultural Landscape of the Eightmile River Watershed

Cultural landscapes are special places created by human interaction with the environment. They are comprised of the cultural and natural resources associated with historic events, activities, or persons, and serve to both define the current character of a community and reflect its past.

Quantifiable features of a cultural landscape include structures such as houses, churches, and public buildings, as well as cemeteries, stone walls, views and vistas, vegetation and topography, and the distribution of transportation systems and land uses. Also considered is the spatial organization of features across the landscape, for example the location of hamlets such as the Eightmile's Millington Green or Hamburg.

In the fall of 2004 an Eightmile River Watershed Cultural Landscape Assessment was completed by the University of Massachusetts's Department of Landscape Architecture and Regional Planning. The cultural landscape assessment included: a narrative of human settlement and the history of landscape change; descriptions of the features and characteristics of three distinct cultural landscape areas in the Eightmile – an agricultural area, a town center, and an industrial center; and a comprehensive analysis of the integrity and significance of the Eightmile cultural landscape as an outstanding resource value.

Overall, the watershed remains a rural place, full of small settlements, winding roads and hiking trails. There are no large commercial developments and convenience stores are outnumbered by general stores and farm stands. Small dispersed hamlets and farmsteads, as well as town greens and 18th and 19th century buildings, are connected by a pattern of circulation dating originally to the Colonial era. The overall historic pattern of settlement and human circulation within the watershed still exists today.

Nearly 300 archaeological and historic architectural sites have been identified for the towns and villages of the Eightmile River watershed, 23 of these are located within 1/2 mile of the Eightmile River and the East Branch. The historic sites, nine of which are listed on the National Register of Historic Places, include many existing buildings, bridges, mills, dams, cemeteries and wharfs, as well as historic districts. (See **Appendix 13 – Assessment of the Archaeological Resources of the Eightmile River Watershed**)

Many individual cultural landscapes within the watershed such as Hamburg Bridge, Sterling City, Millington Green and the Bingham family properties, can be traced to their 18th or 19th century origins. They exhibit great historic integrity in terms of patterns of settlement, circulation, and architecture.

The Eightmile River watershed landscape is a significant example of a successional agrarian landscape in southern New England that is relatively undisturbed by 20th century urbanization or other modern development. There are several reasons why the watershed has seen less change than other comparable areas. The hydrology of the estuary at the mouth of the Connecticut River caused sand bars to accumulate, preventing the river from becoming a major transportation corridor. A major harbor never developed at the mouth of

the Connecticut, inhibiting population growth within the watershed and surrounding area. In addition, the distance of the watershed from metropolitan areas and the lack of easy access to major roads made it less desirable to settle in the Eightmile River Watershed. For those who did settle within the watershed, agricultural practices were limited by the rocky and steep topography. These factors have limited the amount of development within the watershed so today the overwhelming footprint of settlement, circulation and even land use patterns can be traced to 17th, 18th and 19th century origins.

Overall, the cultural landscape of the Eightmile River Watershed has a number of unique features. The watershed is a rural landscape, largely undeveloped with open meadows and fields amidst hills, bedrock outcrops, extensive woodlands, stream corridors and inland wetlands. Lands bordering the Eightmile River have a high potential for intact archaeological resources. The topography, past land use, and lack of modern development contribute to a unique watershed landscape allowing for the possibility of many additional intact archaeological sites to exist. Many of the 17th, 18th and 19th century buildings, structures, and sites analyzed as cultural landscape study areas demonstrate the high degree of historic integrity that remains, particularly in architectural form. As well, the patterns of settlement, circulation, and vegetation add to the overall significance of the landscape. When compared to other watersheds of similar size in Connecticut all of these features combine to make the Eightmile River cultural landscape exemplary as an outstanding cultural resource value.

The full Cultural Landscape Study of the Eightmile River Watershed can be found in **Appendix 5 – Outstanding Resource Value Report – the Cultural Landscape**.

2. How the Cultural Landscape is Threatened

An assessment of threats to the cultural landscape identified 13 potential activities that could degrade the cultural landscape values of the Eightmile River Watershed. A large reason the cultural landscape and its related archaeological resources were found to be of such high quality is because of the lack of development. As a result it is clear the most significant threat to these resources comes from the effects of development including: increases in housing and population; poorly planned development patterns and roads; impervious surfaces from new roadways and other sources; filling and altering wetlands; watercourse crossings; destruction of riparian corridor vegetation; and increases in suburban lawns. All of these activities have the potential to significantly change the character and quality of the landscape as well as damage possibly significant archaeological sites.

A second major threat identified was the general lack of information about the cultural resources, what makes them unique and valuable, where they may be found in the watershed and what can be done to protect them. All this information may be very important to local land use commissions and town staff in land use planning and permitting activities.

3. Existing Protections and Gaps

In order to understand potential additional protection needs for the cultural landscape a comprehensive review was completed of current protection measures planned and implemented at the local, state and federal level. Existing protections include:

- East Haddam requires an archaeological review for new subdivisions to ensure potential sites are not destroyed before they can be analyzed for significance
- Use of the National Register of Historic Places has been used to recognize important resources and obtain possible support to preserve and protect them.
- Active open space conservation work, especially in Lyme, has helped preserve significant landscape characteristics.
- East Haddam's use of the conservation subdivision approach provides the opportunity to place potential new development in a way that minimizes impacts to the landscape and archeological values of a site.
- Inland wetlands and watercourses regulations are in place to protect wetland resources that may potentially also protect important water-related archaeological resources.
- The State Plan of Conservation & Development identifies much of the land in the Eightmile Watershed to be sustained in a way consistent with rural character and the conservation values of the landscape.
- The state scenic road program ensures any changes to state roads are done in a way that is consistent with conserving the characteristics that made the road eligible for "scenic" status. Rt. 156 in Lyme was designated a state scenic road during the Wild & Scenic Study process.
- East Haddam and Lyme have local scenic road programs to recognize unique town roads.
- Some towns utilize local historic districts such as Millington Green in East Haddam to conserve the cultural values of a particular area.
- The Eightmile River is an officially designated state greenway.

Gaps in protection were identified as a result of comparing known cultural landscape threats with existing protection measures. Primary gaps in protecting cultural landscape features include:

- There are no comprehensive maps showing significant landscape features, historic buildings and landmarks or current and potential archaeological resources available to local communities for land use and open space planning activities.
- Lyme and Salem do not require archaeological review of a site during a subdivision application process.
- Towns are currently limited in their ability to manage increases in impervious cover or impacts to riparian corridors possibly affecting potential archaeological sites and historic transportation patterns.
- A town scenic road program is not established for Salem.
- Lyme and Salem do not require use of a conservation subdivision design process.

4. The Cultural Landscape Protection Goal

The cultural landscape goal for the Eightmile River Watershed is to recognize and conserve the scenic, historic and unique features of the cultural landscape within the Eightmile River Watershed, for the quiet enjoyment and recreational use of present and future generations.

5. Indicators of the Cultural Landscape

- a. Natural Topographic Condition
- b. Intact Riparian Corridor
- c. Impervious Surfaces
- d. The Types, Patterns and Degree of Development



Bailey Barn 1947 painting. Photo courtesy of D Bingham.



1700's Bailey Barn today. Photo courtesy of D. Bingham.

6. Recommended Indicator Goals and Tools

6.1 Natural Topographic Condition

Goal

See Geology Sec. 6.1 Goal Natural Topographic Condition – Maintain natural topographic conditions for any gradients of 20% or more

Recommended Tier One Tools –

Local Open Space Committee and Local Land Trusts – Prioritize and pursue conservation of the important topographic features of the Eightmile River Watershed.

Recommended Tier Two Tool

See Geology Sec. 6.1. Natural Topographic Condition Recommended Tier Two Tools – develop data and maps regarding priority slopes and topographic features in the watershed, adopt clear slope limitations for new subdivisions, and establish gravel extraction regulations that include requirements to sites to be restored to reflect a natural topographic appearance.

6.2 Riparian Corridor Condition

Goal

As per Water Quality ORV Sec. 6.1. Riparian Corridor Condition Goal a. Sustain a minimum of 90% natural forest and/or shrub cover with underlying herbaceous vegetation within the 100' riparian zone for the Eightmile Watershed as a whole.

Recommended Tier One Tools

See Water Quality Sec. 6.1. – Riparian Corridor Condition Recommended Tier One Tools – establish a River Protection Overlay Zone, adopt watercourse crossing design guidance, and recognize riparian corridors as priority land conservation areas.

Recommended Tier Two Tools

- a. See Water Quality Sec. 6.1. Riparian Corridor Condition Recommended Tier Two Tools – Identify riparian areas as open space priorities, landowner education regarding the importance of riparian buffers, timber management activities, landscaping requirements, municipal and state road best management practices, subdivision regulations excluding placement of new structures in the riparian corridor.
- b. *Eightmile River Wild & Scenic Committee working with resource professionals* – Identify, map and describe exiting and potential archaeological sites within the riparian corridor for use in open space prioritization efforts and land use application reviews among other things.

6.3. Impervious Cover

Goal

As per Watershed Hydrology ORV Sec. 6.1 Impervious Cover Goal – Future build-out produces no more than 10% impervious surface in any given local basin not already exceeding the target. And future build-out produces no more than 4% impervious surface for the entire Eightmile Watershed.

Recommended Tier One Tools

See Watershed Hydrology ORV Sec. 6.1 Impervious Cover Recommended Tier One Tools – adopt maximum impervious surface limits of 10% per local watershed and 4% for the Eightmile River Watershed as a whole, assess current and potential imperviousness, analyze the implementation of different tools to manage impervious surface levels, determine best for managing impervious surfaces and pursue its adoption, and open space conservation.

Recommended Tier Two Tools

See Watershed Hydrology ORV Sec. 6.1 Impervious Cover Recommended Tier Two Tools – conservation subdivision design or density based zoning, open space planning and acquisition, and public education and outreach.

6.4 Types, Patterns and Degree of Development Patterns of Development

Goal

That new development does not alter or degrade the traditional transportation patterns, historic structures and districts, views or vistas, or potentially significant archaeological resources.

Recommended Tier One Tools - none

See Unique Species & Natural Communities Sec. 6.4 - Presence of Large Intact Habitat Blocks – Recommended Tier One Tools – establishing an open space strategy that prioritizes key resource values such as the cultural landscape, work on open space opportunities in partnership with other interests and pursue federal funding support if feasible

Recommended Tier Two Tools

- a. *Eightmile River Wild & Scenic Committee working with Town Commissions and Resource Specialists* – Create an up-to-date map of the cultural, scenic and archaeologically significant resources of the Eightmile River Watershed. This should include current and potential resources.
- b. *Local Municipal P&Z* – Adopt the cultural and archaeological features map as a guidance document when reviewing potential impacts of new developments.
- c. *Local Municipal P&Z* – Adopt regulations to perform archaeological reviews associated with new development activities.
- d. *Local Municipal Open Space Committee* – Identify exceptional cultural landscape or archaeological features as an important conservation priority in open space planning guidance.
- e. *Landowners, Eightmile River Wild & Scenic Committee, Local Historical Societies* – Identify and pursue opportunities to add significant cultural and archaeological resources to the National Register of Historical Places, as well as pursue opportunities where appropriate to establish National or Local historic districts.
- f. *Eightmile River Wild & Scenic Committee* – Identify and pursue opportunities to add unique state roadways to the state scenic road program.
- g. *Eightmile River Wild & Scenic Committee and Local Municipal P&Z* – Establish local scenic road programs if not already in place. Identify and pursue opportunities to add unique local roadways to the town scenic road program.
- h. *Local Municipal P&Z* – Adopt conservation subdivision design standards if not already in place.



East Branch Eightmile Mumford Farm Crossing. Photo courtesy of L. Todd.

Tier One Management Tool Recommendations

Tier one tools are the highest priority actions proposed in the management plan. Six tools have been proposed for implementation by local municipalities working with the Eightmile River Wild & Scenic Coordinating Committee and other stakeholders. Following is a brief description of the background and rationale for the tools as well as a description of the tool itself. Greater details are provided in the appendices.

Note: These are only recommendations. The actual implementation of these recommendations will require all the formal procedures the local commissions must follow especially in considering and potentially adopting any new regulations, including public notice, public hearings, and commission deliberation prior to making a final determination.

A. RIPARIAN CORRIDOR PROTECTION

Background

The riparian corridor is typically defined as a vegetative upland area (determined by soils, topography and vegetation) directly adjacent to a wetland or watercourse with ecological, hydrologic and physical connections to the wetland or watercourse.

The riparian corridor functions include:

- Preserving water quality by filtering sediment and other pollutants from runoff before it enters a river, stream or shallow groundwater
- Protecting stream banks from erosion by maintaining an intact root structure along the banks
- Providing a storage area for flood waters
- Providing food and habitat for fish and wildlife – riparian areas provide more biologically productive functions in proportion to their area than do uplands
- Providing shade for rivers and streams to keep water temperatures lower and dissolved oxygen levels in the water higher.

Activities in the riparian corridor that remove or alter the functionality of the natural, native vegetative cover can substantially degrade its ability to perform the many ecosystem functions listed above.

Extensive research was done looking at other riparian corridor protection efforts including:

- The Massachusetts River Protection Act, established in 1996, which requires a 200 foot resource protection area along all perennial streams in the state (except for 14 highly urbanized communities where the area is reduced to 25 feet)
- The Farmington River Protection Zoning Overlay District, adopted in 1992, establishes a 100 foot overlay protection area along the Wild & Scenic Farmington River in four communities in Connecticut
- The new CT River Gateway Standards which establish a 50 foot no activity zone and a 100 foot no structure area along waterbodies in the Gateway Zone. The Town of Lyme in June 2005 adopted these standards for their Gateway area that includes Hamburg Cove.

Recommendations

Each community adopts a River Protection Overlay Zone for all perennial streams and rivers in the Eightmile River Watershed that provides a 50 foot protection area on small headwater streams, and a 100 foot protection area on larger streams. The proposed Overlay zone is flexible, respecting pre-existing uses and providing for uses within the overlay area consistent with protection of riparian corridor function.



Habitat fragmentation in the watershed. Photo courtesy of A. Irving.

The effect of this proposal on property owners is very small. Only 5 % of all the lands in the watershed would be within the proposed overlay. Of that, 97% of the overlay protection area is already regulated by local Inland Wetlands Commissions as either wetland or upland review area. The proposal is sensitive to ensuring landowners are not unduly burdened through its potential implementation. Details of the proposal, its purpose and its limitations can be found in the appendices.

See Maps 8, 9 and 10: Proposed River Protection Overlay Zone, Existing Municipal Upland Review Areas and Wetlands and Watercourses

B. HABITAT FRAGMENTATION

Background

The Eightmile River Watershed has substantial unfragmented areas – 26% of the unfragmented blocks are greater than 500 acres in size, 15% are greater than 1,000 acres in size and 5% are greater than 2,500 acres in size.

Habitat size directly affects species distribution, migration and population size, and is critical for achieving overall biological diversity and ecosystem function. Habitat fragmentation occurs when a large region of habitat has been split into a collection of smaller patches. For example, a forest habitat may become fragmented when a road is built across it causing the single, large, continuous patch of forest to become two smaller disconnected patches.

Fragmentation can cause, among other things: a reduction of total habitat area; the loss of habitat for species requiring large uninterrupted blocks; vulnerability for species needing to migrate to other habitat patches; the isolation of populations leading to a decline in population size and quality; and edge effects altering habitat, species composition, microclimates, and vulnerability to predation.

Recommendation

Commit to making protection of important habitat blocks an open space conservation priority and be a partner in pursuing federal funding to support such types of acquisitions. The most effective strategy to protect key habitat blocks in the watershed is though working with willing landowners on a voluntary basis to achieve open space conservation of important habitat areas.

Details of a Land Protection Program approach for the Eightmile River Watershed are at the end of this chapter in Section E.

1. Endorse the remaining unfragmented habitat blocks as high priority open space conservation areas through pertinent town planning documents such as the Town Plan of Conservation and Development and the Town Open Space Plan.
2. Establish a land protection goal for each community and the watershed as a whole.
3. Commit to working with other partners, such as local land trusts, the Nature Conservancy and the State to leverage resources and collaborate when opportunities arise to protect priority lands.
4. Endorse support for federal funding assistance to help support such open space conservation actions. While the federal government will not own or manage any land associated with a Wild & Scenic designation, a designation may create an opportunity to access federal funds that local agencies could use to support open space conservation. Clearly stating such an interest in the Management Plan will be helpful in pursuing such funding resources.

See Maps 11, 12 and 13:
Habitat Blocks with Current Buildings, Open Space and Projected Buildout

C. INCREASES IN IMPERVIOUS SURFACES

Background

Impervious surfaces, including rooftops and parking lots, can affect overall water quality and hydrology in the watershed as well as block rainfall from infiltrating into the soil, increasing surface runoff and decreasing groundwater infiltration. This disruption of the water cycle leads to a number of changes, including: increased volume and velocity of runoff; increased frequency and severity of flooding; peak flows many times greater than in natural basins; loss of natural runoff storage capacity; and reduced groundwater recharge causing a decreased base flow, in turn potentially causing streams to become intermittent or dry. Water quality as well can be affected as impervious surfaces increase polluted stormwater runoff impacting nutrient levels, temperature, bacteria and heavy metals, among other things. This combination of factors has been shown to degrade aquatic life and habitat quality when imperviousness is as low as 4%.

The Eightmile River Watershed is currently estimated to have an impervious surface level or approximately 3%. This level is a key reason why the Eightmile River Watershed is still an intact and functioning watershed ecosystem, the key outstanding resource value for the Wild & Scenic Study. Various scenarios of how the watershed could be built-out show that impervious cover could increase to over 11% causing substantial degradation to overall watershed health.

Recommendation

Each community sets a maximum impervious surface goal of 10% for any local watershed and 4% for the Eightmile River Watershed as whole. This approach asks each community to work with the Eightmile River Committee to undertake a detailed assessment of current and potential imperviousness in each local watershed for each community. Through such an analysis the amount of impervious cover still possible can be determined for each local watershed. From the assessment determine the most effective, appropriate and realistic tool for managing impervious surfaces and pursue its adoption.

See Maps 14 and 15:
Impervious Cover

D. STORMWATER MANAGEMENT

Background

Poor stormwater management can affect a host of issues associated with overall watershed quality including impacts to: overall hydrology; stream channel morphology; floodplain function; water quality; habitat; and overall ecological function. The CT Dept. of Environmental Protection reports in the state's 2004 Stormwater Quality Manual that approximately one-quarter of the state's major rivers and streams are impaired and not meeting Clean Water Act standards due to stormwater issues.

The proposed actions are some of the most current best management practices available to provide communities guidance in how to effectively manage stormwater runoff and minimize its impacts.

Recommendations

Adopt a series of actions that will provide better guidance and apply state-of-the-art approaches to managing stormwater runoff. Specific proposed actions include:

1. Require the 2004 CT DEP Stormwater Quality Manual be used as guidance for the design, implementation and maintenance of all new and existing stormwater systems in each community.
2. Complete and implement a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems.
3. Adopt The University of Massachusetts guidance for watercourse crossings, an approach that is used by Army Corps of Engineers (New England Region).



Storm low impact design in a local subdivision. Photo courtesy of CRCCD.

E. EIGHTMILE WATERSHED LAND PROTECTION PROGRAM

The role voluntary open space conservation can still play in the Eightmile River Watershed is substantial. All of the outstanding resource values include open space conservation as an important management recommendation. All the communities recognize open space conservation is important and in different degrees have been working on open space issues from undertaking open space planning to dedicating town funding to implementing specific land conservation actions.

This Plan recommends establishing an Eightmile River Watershed Land Protection Program that takes a cooperative approach to implementing an open space conservation strategy for the Watershed. It is recommended that a Land Protection Program include a number of components including:

- Understanding which lands within the watershed are most important for consideration for potential conservation. Findings from the Wild and Scenic River Study and previous studies are recommended to support such an exercise. Specifically, it is recommended that each town review the “buildable lands” map produced during the study and recognize that the fate of these lands (how and whether these lands are developed, conserved or otherwise utilized) will be significant to the ultimate outcome of the outstanding resource values (and other town priorities as well).
- Working in collaboration, the towns establish a collective vision and goal for open space conservation in the watershed. Specifically, it is recommended that each town identify its vision and/or goals for the outcome of the “buildable lands” within the watershed – to produce a “plan” for these areas which establish not only conservation goals but other town priorities which these areas may need to help support.
- As part of the above bullet, establishing criteria for setting open space conservation priorities for the watershed that include specifics regarding the protection and enhancement of the Watershed’s outstanding resource values. It is suggested that priority be given to the unfragmented habitat blocks and riparian areas identified previously in this plan.
- Identification of the diverse set of tools available for accomplishing open space conservation including but not limited to traditional tools such as willing seller acquisition of properties. Other tools include but are not limited to donation or purchase of conservation easements which allow continued private ownership, use and fulfillment of private goals for the land while also allowing for achievement of community open space goals. Additionally, development projects that towns may wish to support on behalf of economic development and/or other community goals can potentially be compatibly structured with open space and conservation goals depending on where and how they are approached and designed.
- Integration of this work into each town’s Plan of Conservation and Development and associated mapping.
- Towns work collaboratively with other partners such as local land trusts, the State, The Nature Conservancy and the Eightmile River Wild and Scenic Coordinating Committee to achieve land protection goals.

- Proactively, collaboratively and explicitly seeking federal funding assistance for land protection as part of Eightmile Wild and Scenic River designation. This likely involves working with the Eightmile River Wild and Scenic Coordinating Committee, each town, the National Park Service and some or all of the Connecticut Congressional delegation among others to advocate for a special federal funding assistance element to future federal funding under and for the Eightmile Wild and Scenic River designation.
- Supporting and advocating in a collaborative way for access to other land conservation funding resources.
- Recognizing all planning and implementation of land protection efforts should be flexible and tailored to each individual community.

See Map 16: **Remaining Buildable Land** and
Map 7: **Intact Ecosystem** (with unfragmented habitat blocks).

See **Appendix 14**
Eightmile River Watershed Project Land Resources Inventory
and Data Analysis



Example of road runoff in the watershed. Photo courtesy of CRCCD.



Summary of Tools

Organized By Proposed Implementing Entity

LOCAL PLANNING & ZONING – TIER ONE

Water Quality

- Each community adopts a River Protection Overlay Area for all perennial streams and rivers in the Eightmile River Watershed that provides a 50 foot setback from the edge of small headwater streams, and a 100 foot setback from the edge of larger streams.
- Each community adopts the University of Massachusetts River and Stream Crossing Standards: Technical Guidelines, August 6, 2004.
- Require the CT DEP Stormwater Quality Manual, which is a non-regulatory guidance document, be used as the best management approach for the design, implementation and maintenance of all new and existing stormwater systems in each community.
- Work with the local Dept. of Public Works to complete and implement a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems.

Watershed Hydrology

- Each community adopts maximum impervious surface limits of 10% per local watershed and 4% for the Eightmile River Watershed as a whole.
- Working with the Eightmile River Committee, undertake a detailed assessment of current and potential imperviousness in each local watershed for each community.
- Analyze the implementation of different potential tools to manage impervious surface levels, including the East Haddam concept and the Lyme approach. Determine the most effective, appropriate and realistic tool for managing impervious surfaces and pursue its adoption.

Unique Species & Natural Communities

- Adopt the University of Massachusetts River and Stream Crossing Standards: Technical Guidelines, August 6, 2004.

LOCAL PLANNING & ZONING COMMISSION – TIER TWO

Cultural Landscape

- Work with ERWSC as lead to create an up-to-date map of the culturally and archaeologically significant resources of the Eightmile River Watershed. This should include current and potential resources.
- Adopt the cultural and archaeological features map as a guidance document when reviewing potential impacts of new developments.
- Adopt regulations to perform archaeological reviews associated with new development activities.
- Establish local scenic road programs if not already in place. Identify and pursue opportunities to add unique local roadways to the town scenic road program.
- Adopt conservation subdivision design standards if not already in place.

Geology

- Work with the detailed slope information developed by ERWSC to identify priority areas for protecting natural topographic features such as ridgelines.
- Adopt clear slope limitations in subdivision regulations that will provide for maintaining natural topographic conditions to the greatest extent feasible.
- Adopt gravel extraction regulations that require site restoration conditions to be consistent with maintaining a natural topographic appearance.
- Support ERWSCC in the creation of an up to date map of exceptional bedrock and glacial features within each community to be used in land use decision making and open space planning activities.
- Implement use of the up to date map of exceptional bedrock features developed by ERWSC to help protect unique geologic features during the permitting process.
- Modify local regulations to recognize the importance of protecting exceptional bedrock and glacial features when reviewing applications for activities including gravel extraction and subdivisions.

Water Quality

- Support ERWSC in implementing landowner education and outreach initiatives on the importance of riparian buffers.
- Incorporate riparian areas as a priority in open space planning and acquisition activities, as well as when identifying open space set aside in new subdivision applications.
- If not already in place, establish and implement clear regulations regarding timber management activities.
- Establish landscaping requirements that incorporate riparian area protection
- Implement subdivision regulations that excludes placement of new structures in the riparian corridor.
- Establish suburban lawn and landscape best management recommendations that minimize fertilizer and pesticide impacts to water quality.
- Establish (or update) and implement regulations to minimize non-point source pollution associated with timber management activities.
- Adopt local aquifer protection regulations to protect water quality in groundwater aquifer systems.
- Establish septic system maintenance regulation.
- Establish a Residential Underground Storage Tank Removal Regulation.
- Establish and enforce slope limitations for all new construction to minimize potential erosion and sedimentation issues.
- Promote best management practices for agricultural land uses that prevent non-point source pollution .
- Support ERWSCC in implementing landowner education and outreach initiatives on the importance of riparian buffers.
- Work with Inland Wetlands Commissions to consider the potential water quality affects of activities allowed under the state agricultural exemption and determine potential strategies to minimize water quality degradation from such impacts.

Watershed Hydrology

- If not already implemented, consider implementation of conservation subdivision design standards or density based zoning requirements to help manage growth in impervious cover.
- Consider implementation of aquifer protection regulations to protect groundwater resources.
- Support ERWSC in establishing and implementing a capacity to map detailed landcover information and track changes on a regular basis.
- Establish regulations such as maximum building coverage, maximum impervious surface or minimal landscaped area to manage change in forest and vegetative cover.
- Adopt earth extraction regulations that ensure groundwater/surface water interactions are protected and aquifer storage is sustained so as to maintain natural hydrologic conditions of river, stream and wetland resources.
- Support ERWSCC in establishing a capacity to map detailed landcover information and track landcover changes on a regular basis.

Unique Species and Natural Communities

- Adopt conservation subdivision design standards to support conservation of known rare species and communities and important habitat blocks.
- Implement appropriate regulations that require all landscaping, planting, and ground-cover materials be a non-invasive species and prohibit all non-native invasive species from being used in any new activity.
- *Local Municipal P&Z* – Adopt conservation subdivision design standards to support conservation of important habitat blocks.



Pleasant Valley Preserve. Photo courtesy of W. Moorehead.

LOCAL INLAND WETLANDS COMMISSION – TIER ONE

Water Quality

- Each community adopts the University of Massachusetts River and Stream Crossing Standards: Technical Guidelines, August 6, 2004.
- Require the CT DEP Stormwater Quality Manual, which is a non-regulatory guidance document, be used as the best management approach for the design, implementation and maintenance of all new and exiting stormwater systems in each community.
- Establish suburban lawn and landscape best management recommendations that minimize fertilizer and pesticide impacts to water quality.

LOCAL INLAND WETLANDS COMMISSION – TIER TWO

Watershed Hydrology

- Regulate all commercial diversions under 50,000 gallons per day.

Water Quality

- Work with P&Z to consider the potential water quality affects of activities allowed under the state agricultural exemption and determine potential strategies to minimize water quality degradation from such impacts.
- Work with local P&Z to establish suburban lawn and landscape best management requirements that minimize fertilizer and pesticide impacts to water quality.

LOCAL CONSERVATION COMMISSION (WORKING WITH LOCAL OPEN SPACE COMMITTEE) – TIER ONE

Unique Species and Natural Communities

- Endorse the remaining unfragmented habitat blocks as high priority open space conservation areas through pertinent town planning documents such as the Town Plan of Conservation and Development and the Town Open Space Plan.
- Establish a land protection goal for each community and the watershed as a whole.
- Commit to working with other partners, such as local land trusts, the Nature Conservancy and the State to leverage resources and collaborate when opportunities arise to protect priority lands.
- Endorse support for federal funding assistance to help support such open space conservation actions. While the federal government will not own or manage any land associated with a Wild & Scenic designation, a designation may create an opportunity to access federal funds that local agencies could use to support open space conservation. Clearly stating such an interest in the Management Plan will be helpful in pursuing such funding resources.

TIER TWO

- Complete natural resource inventory for the community..



Historic Woodbridge Cemetery.
Photo courtesy of D. Bingham.



March 23, 2006

To Whom it may concern:

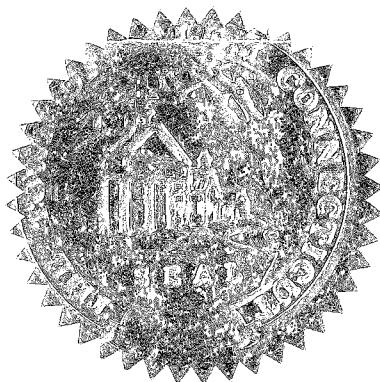
At a special Town Meeting held at Gardner Lake Volunteer Fire Company, 429 Old Colchester Road, Salem, Connecticut on February 1, 2006 the electors of the town of Salem, Connecticut **endorsed** the Eightmile River Watershed Management Plan and the recommendation that "Wild and Scenic" status be adopted by the United States Congress in a vote of 108 Ayes to 8 Nays.

Certified to be a true reporting of a resolution passed at the town meeting specified above in Salem, Connecticut.

ATTEST:



Patricia J. Crisanti CCTC
Town Clerk of Salem



Special Town Meeting
January 23, 2006

Town Clerk, Debra H. Denette, called the Special Town Meeting to Order at 8:01 p.m. at the auditorium of the Nathan Hale Ray High School. The Pledge of Allegiance was recited. Approximately 450 people were in attendance, including many high school students. Brad Parker motioned to nominate Deb Denette as Moderator. Pete Govert seconded the motion.

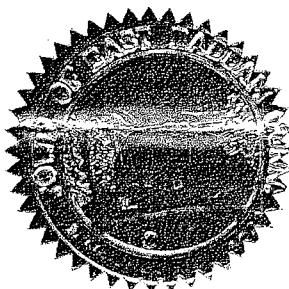
The Town clerk called for other nominations from the floor. None were offered. Brad Parker motioned to close nominations. Said motion was duly seconded and carried unanimously via voice vote. A vote was called for regarding the nomination of Deb Denette as Moderator. It passed unanimously via voice vote.

The Moderator briefly explained the rules of conduct for Town meeting. The call of the meeting was read by the Town Clerk, Bradley Parker motioned to accept the call of the meeting as read. The motion was duly seconded by Joe Albuquerque and carried unanimously via voice vote.

Item 1: Laurie Alt motioned that the legislative body herein assembled act upon the recommendation of the Board of Selectmen, Inland Wetlands and Watercourse Commission, and Planning and Zoning Commission to endorse the Eightmile River Watershed Management Plan developed by the Eightmile River Wild and Scenic River Study Committee, together with its recommendation to seek Wild and Scenic River Designation through an act of the United States Congress. Said Eightmile River Watershed Management Plan is on file with the Town Clerk of the Town of East Haddam for public inspection. Said motion was duly seconded. A presentation was made by members of the Wild & Scenic study committee. Comments and questions were raised and where appropriate answered. After approximately an hour of discussion, upon a motion to call the question made by Laurie Alt and duly seconded, and unanimously approved a voice vote was called for. The Moderator being unable to determine the outcome of the voice vote called for a vote via a show of hands. The motion carried with the following results:

435 voted 295 yes 140 no

United States Senator Christopher Dodd briefly addressed the audience and the significance of the motion that was just adopted.



Item 2: Laurie Alt motioned that the legislative body herein assembled act upon the recommendation of the Board of Selectmen and the Board of Finance to accept a grant from the Department of Homeland Security and the Office for Domestic Preparedness entitled "FY 05 Assistance to Firefighters Grant" in the amount of \$53,153.00; and to appropriate said funds to line #841 Fire Department Equipment; and to appropriate matching funds in the amount of \$2,797.00 from Contingency to line #841 Fire Department Equipment; for a total grant amount of \$55,590.00. Said motion was duly seconded. Opportunity for discussion was offered, there were no comments. Said motion carried unanimously via voice vote.

Item 3: Pete Govert motioned that the legislative body herein assembled act upon the recommendation of the Board of Finance and the Board of Selectmen to accept a grant in the amount of \$7,000.00 from the State of Connecticut, State Library, for the purpose of historic document preservation; and to appropriate said grant to the Historic Document Preservation Fund. Said motion was duly seconded. The Town Clerk advised that these funds will be used to microfilm older meeting records that have yet to be preserved. Opportunity for discussion was offered, several questions were asked and answered. The Town clerk called for a vote, the motion carried unanimously via voice vote.

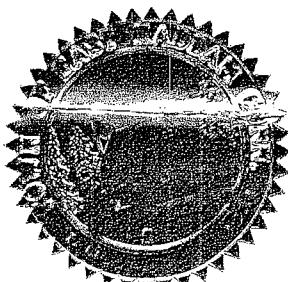
Item 4: Jim Ventres motioned that the legislative body herein assembled act upon the recommendation of the Board of Finance to appropriate \$130,000.00 from the Undesignated Fund Balance to line #890 Board of Education CIP - High School Field Lighting Project. Said motion was duly seconded. Mr. Parker made a few brief comments explaining the project. Opportunity for discussion was offered. Comments were offered and questions were asked and answered. John Blaschik moved the question, which action was duly seconded and carried via unanimous voice vote. The Moderator called for a vote. Dick Everett voted in opposition, the remainder of the votes were unanimously in favor. Motion carried.

There being no further business, upon a motion made by Richard Parker and seconded by Ruth Ziobron, the meeting adjourned at 9:20 p.m.

ATTEST:

Debra H. Denette
Town Clerk of East Haddam

February 2, 2006



WARNING SPECIAL TOWN MEETING
JANUARY 13, 2006

139

ELECTORS AND CITIZENS QUALIFIED TO VOTE IN TOWN MEETING ARE HEREBY WARNED THAT A SPECIAL TOWN MEETING WILL BE HELD ON FRIDAY, JANUARY 13, 2006, AT THE LYME CONSOLIDATED SCHOOL, HAMBURG ROAD, LYME, CONNECTICUT AT 8:00 P.M. FOR PRESENTATION OF THE FOLLOWING AGENDA:

1. CONSIDER AND ACT UPON A RESOLUTION BY WHICH THE TOWN OF LYME WOULD ENDORSE THE EIGHTMILE RIVER WATERSHED MANAGEMENT PLAN DEVELOPED BY THE EIGHTMILE RIVER WILD AND SCENIC RIVER STUDY COMMITTEE, TOGETHER WITH ITS RECOMMENDATIONS TO SEEK WILD AND SCENIC RIVER DESIGNATION THROUGH AN ACT OF THE UNITED STATES CONGRESS.
2. CONSIDER AND ACT UPON A RESOLUTION REQUIRING THE BOARD OF SELECTMEN TO CONSIDER THE DEVELOPMENT OF A NOISE ORDINANCE FOR THE TOWN OF LYME.

DATED AT LYME, CONNECTICUT THIS 6th DAY OF JANUARY 2006.

WILLIAM T. KOCH, JR.
PARKER H. LORD
STEVEN MATTSON

RECORDED BY: TOWN CLERK

SPECIAL TOWN MEETING MINUTES JANUARY 13, 2006

MEETING CALLED TO ORDER BY FIRST SELECTMAN, WILLIAM T. KOCH, JR. AT 8:00 P.M.. THE MEETING WAS THEN ORGANIZED BY THE SELECTION OF ROWLAND BALLEK AS MODERATOR. THE CALL OF THE MEETING WAS READ BY RUTH PERRY, TOWN CLERK.

THE FIRST ITEM TO COME BEFORE THE MEETING WAS A RESOLUTION CONCERNING THE EIGHTMILE RIVER WATERSHED MANAGEMENT PLAN.

RESOLUTION:

WHEREAS: THE 62 SQUARE MILE EIGHTMILE RIVER WATERSHED IS AN EXCEPTIONAL NATURAL AND CULTURAL RESOURCE IN THE TOWN OF LYME.

AND WHEREAS: ON NOVEMBER 6, 2001, PUBLIC LAW NO. 107-65, SUPPORTED BY CONGRESSMAN ROB SIMMONS AND SENATOR CHRISTOPHER DODD WAS PASSED AUTHORIZING THE COMMENCEMENT OF A WILD AND SCENIC RIVER STUDY TO BE FUNDED BY THE UNITED STATES CONGRESS.

AND WHEREAS: IN 2005, GOVERNOR RELL SIGNED INTO LAW PUBLIC ACT=05-18 WHICH PROCLAIMED THE STATE OF CONNECTICUT'S SUPPORT FOR CONGRESSIONAL WILD AND SCENIC DESIGNATION OF THE EIGHTMILE RIVER WATERSHED:

AND WHEREAS: THERE ARE MANY BENEFITS TO A WATERSHED APPROACH TO MANAGEMENT OF THE EIGHTMILE RIVER AND WILD AND SCENIC DESIGNATION:

NOW THEREFORE:

BE IT RESOLVED BY THE TOWN OF LYME IN TOWN MEETING CONVENED THAT THE TOWN OF LYME ENDORSES THE EIGHTMILE RIVER WATERSHED MANAGEMENT PLAN DEVELOPED BY THE EIGHTMILE RIVER WILD AND SCENIC RIVER STUDY COMMITTEE, TOGETHER WITH ITS RECOMMENDATION TO SEEK WILD AND SCENIC RIVER DESIGNATION THROUGH AN ACT OF THE UNITED STATES CONGRESS.

MOVED

SECONDED

DISCUSSION

ANTHONY OPENED THE DISCUSSION WITH A HISTORY OF WHAT THE EIGHT MILE RIVER STUDY GROUP HAS BEEN DOING OVER THE PAST FOUR YEARS MR. IRVING EMPHASISED THE AREAS NATURAL UNIQUENESS AND A NEED TO PROTECT THIS AREA AS BEING ONE OF THE FEW LEFT IN THE NATION. THE MANAGEMENT PLAN WOULD PROTECT THE AREA AND COST THE TOWN NOTHING. THIS PROTECTION GOAL FORMALLY DECLARIES THE IMPORTANCE WITH LOCAL CONTROL WHILE HAVING THE FUNDING SOURCE FROM THE GOVERNMENT. (ALSO SEE ATTACHED FACT SHEET).

NATHAN FROLING FROM THE NATURE CONSERVANCY ALSO SPOKE CONCERNING THE IMPORTANCE OF THIS PROPOSAL AND CONFIRMED THAT THE SELECTMEN, THE LOCAL LAND USE BOARDS AND OTHERS HAVE ENDORSED THIS LOCAL CONTROL PLAN. THE MANAGEMENT PROVIDES GUIDELINES AND RECOMMENDATIONS WITH NO NEW AUTHORITY. THERE IS NO FEDERAL REGULATION, NO FEDERAL MANDATES.

QUESTIONS: MR. FURGESON QUESTIONED THE ADMINISTRATIVE BURDEN ON THE TOWN WHICH WOULD BE IMPOSED. WHAT HAPPENS TO PROPERTY OWNERS ON THE RIVER?

6 Pages
CERTIFIED TO BE A TRUE COPY
DATE 3/23/06 TIME 9:00 AM
ATTEST: *[Signature]*
TOWN CLERK, LYME, CONN.

AGAIN NO FINANCIAL COST TO TOWN. IMPACT ON LOCAL LANDOWNERS WOULD BE THE SAME AS ANY PRESENT REGULATIONS SUCH AS PLANNING AND ZONING. THERE WOULD BE A PUBLIC PROCESS INVOLVED.

CARTER COURTNEY FEELS THAT THERE WILL BE NEW REGULATIONS EMPOSED ON LANDWONERS ON THE RIVERS. HIS CONCERN FOR UNDO HARDSHIP.

ANTHONY IRVING RESPONDED WITH THERE WOULD BE NO HARDSHIPS FOR LANDOWNERS. PLEADS FOR KEEPING THE RIVERS CLEAN. A REGIONAL APPROACH TO PROTECT THE RIVER.

MR. ORZACK WHAT AREA OF THE TOWN WOULD BE EFFECTED?

ANSWER: 28 MILES OF RIVERS AND PRIMARY STREAMS. EAST HADDAM AND SLAEM NEEDS TO SUPPORT.

JOHN LEONARD LANDWONERS ARE UP AGAINST THE REST OF THE VOTING COMMUNITY WHEN IT COMES TO CONTROL OF LAND ON THE WATERFRONT. MR. LEONARD DOES NOT FEEL COMFORTABLE AS TO WHAT NEW REGULATIONS MIGHT EFFECT THESE LANDOWNERS.

MRS. WILKINS DESCRIBED THE FEDERAL PLAN TO CONTROL RIVERS IN THE FUTURE TO BE A WATER SOURCE FOR THE LOWER PART OF CONNECTICUT. THIS PLAN KEEPS CONTROL OF THE RIVERS HERE.

MR. WOODY SPOKE AS A LANDOWNER ON THE RIVER AND FEELS THAT THERE ARE NOT ENOUGH REGULATIONS AND WELCOMES THIS IDEA.

MR. THACH INDICATED THAT IT WAS OUR DUTY TO DEFEND AND PROTECT THE TOWN'S NATURAL RESOURCES WITH NO COST AND LOCAL CONTROL

THE NATIONAL PARK SERVICE WOULD BE THE OVERSIGHT FEDERAL AGENCY.

THERE BEING NO FURTHER DISCUSSION THE MODERATOR CALLED FOR THE VOTE:

VOTED STRONGLY AFFIRMATIVE

SOME NAYS

RESOLUTION #2

CONCERNING THE DEVELOPMENT OF A NOISE ORDINANCE

WHEREAS: A PETITION WAS RECEIVED BY THE BOARD OF SELECTMEN REQUESTING THAT THE BOARD OF SELECTMEN "CONSIDER THE DEVELOPMENT OF A NOISE ORDINANCE FOR THE TOWN OF LYME."

AND WHEREAS: THE BOARD OF SELECTMEN HAS ALREADY CONSIDERED A NOISE ORDINANCE FOR THE TOWN OF LYME AND UNANIMOUSLY DETERMINED THAT A NOISE ORDINANCE IS NOT APPROPRIATE FOR THE TOWN OF LYME AT THIS TIME

NOW THEREFORE:

BE IT RESOLVED BY THE TOWN OF LYME IN TOWN MEETING CONVENED THAT THE BOARD OF SELECTMEN SHOULD NOT CONSIDER A NOISE ORDINANCE FOR THE TOWN OF LYME AT THIS TIME.

MOVED

SECONDED

DISCUSSION: MR. KOCH TURNED OVER THE MEETING TO CHRISTINE SEMENZA WHO BROUGHT THE PETITION TO THE BOARD OF SELECTMEN. MRS. SEMENZA SPOKE ABOUT CONSERVATION AND HOW PEACE AND TRANQUILITY ARE A PART OF THAT. SHE SAYS THE RURAL, QUIET CHARACTER OF THE TOWN IS RUINED BY NOISE QUALITY NOT CONSISTANT WITH THIS ATMOSPHERE AND SUGGESTS A STUDY COMMITTEE BE FORMED TO RESEARCH FURTHER A NOISE ORDINANCE.

THERE WAS A SUGGESTION OF PLACING SOMETHING IN THE PLANNING AND ZONING REGULATIONS CONCERNING CONSTRUCTION. MRS. SEMENZA DOES NOT FEEL THAT THIS ENOUGH

SHE URGES A COMMITTEE BE FORMED TO INVESTIGATE JUST WHAT THE ORDINANCE COVERS HOW IT WOULD BE ENFORCED and THEN BE BROUGHT TO ANOTHER TOWN MEETING FOR A VOTE.

MR. KOCH SAID THAT THE BOARD OF SELECTMEN INVESTIGATED NOISE ORDINANCES IN OTHER TOWNS. TOWN ATTORNEY WHO LIVES IN OLD LYME WAS NOT AWARE OF THE NOISE ORDINANCE IN OLD LYME BUT DETERMINED THAT TOWNS WOULD NEED EQUIPMENT TO MEASURE NOISE AS WELL AS AN ENFORCEMENT AGENCY SUCH AS A LOCAL POLICE DEPARTMENT.

MR. ORZECH FELT NEIGHBORS SHOULD SPEAK TO ONE ANOTHER AND WORK THINGS OUT.

MR. TIFFANY FELT THE SAME WAY AND GAVE AN EXAMPLE OF AN EVENT IN HIS CHILDHOOD WHERE NEIGHBORS HELPED AND AGAIN SPOKE TO WHAT KIND OF COMMUNITY LYME WAS AND HAS BECOME.

HADLYME HISTORICAL DISTRICT REPRESENTATIVE SPOKE OF THE NOISE FROM MOTORCYCLES AT THE FERRY LANDING AND LAWN MOWING AT UNREASONABLE HOURS AND WOULD LIKE TO SEE A NOISE ORDINANCE.

MRS. CRITES HAS A PROBLEM ON BEAVERBROOK ROAD WITH DIRT BIKES ON A NEIGHBORING PROPERTY. SHE HAS CALLED THE NEIGHBOR AND HAS NOT HAD ANY LUCK. SUGGESTED SHE CONTACT THE STATE POLICE.

MRS. IRVING SPOKE OF THE NOISE ON RT.156. TOWN ORDINANCE COULD NOT REGULATE STATE ROADS.

MR. KOCH INDICATED THAT THE STATE POLICE WOULD RESPONDE TO BREACH OF PEACE.
DOGS :

MAUREEN GRIFFIN INDICATED THAT THERE ARE STATE LAWS REGARDING BARKING DOGS AND THE LOCAL DOG WARDEN WOULD ENFORCE THESE LAWS.

NORMAN CAINE SUGGESTED A COMMITTEE BE FORMED.

THE MODERATOR CALLED FOR A VOTE AFTER CLAIRFIYING JUST WHAT YES AND NO MEANT.
MOTION VOTED YES

SOME NAYS

A MOTION TO ADJOURN THE MEETING WAS CALLED BY ANTHONY IRVING. SECONDED
MEETING ADJOURNED AT 8:50 p.m.

THERE WAS A LARGE TURNOUT AT THIS MEETING ON A VERY FOGGY NIGHT.

RECORDED BY: TOWN CLERK *Rick Perry*

Bradley P. Parker
First Selectman

Randolph W. Dill
Peter T. Govert
Selectmen

Office: 860-873-5020
Fax: 860-873-5025
Email: admin@easthaddam.org

Selectmen's Office

TOWN OFFICE BUILDING
EAST HADDAM
CONNECTICUT
06423



April 4, 2006

Eightmile River Wild and Scenic Study Committee
c/o Anthony Irving, Chairman
P.O. Box 1002
Lyme, CT 06371

Dear Anthony,

I am writing on behalf of the East Haddam Board of Selectmen to confirm the Selectmen's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the selectmen at their meeting on September 27, 2005.

A copy of the endorsement is included with this letter.

Sincerely,

Brad Parker
First Selectman



SAMPLE OF FULL
LAND USE DEPARTMENT
ENDORSEMENT

CERTIFIED RESOLUTION

Eightmile River Wild & Scenic River Study
Management Plan Endorsement

Certified a true copy of a resolution adopted by the Town of East Haddam, CT at a meeting of its Board of Selectmen on September 27, 2005 and which has not been rescinded or modified in any way whatsoever.

October 25, 2005

Debra H. Denette

(Debra H. Denette, Town Clerk)

At a meeting of the Board of Selectmen held on September 27, 2005, a motion was made by Board Member Brad Parker and seconded by Board Member Randolph Dill, to endorse the following management plan as presented:

WHEREAS, the Town of East Haddam Board of Selectmen recognizes that the Eightmile River Watershed provides outstanding resource values including water quality, watershed hydrology, unique species and natural communities, geology, the cultural landscape and the watershed ecosystem that are important for the well-being and quality of life of the Town of East Haddam; and

WHEREAS, the Town of East Haddam Board of Selectmen recognizes the Eightmile River Watershed Management Plan, that has been developed in partnership with local communities and will be implemented in partnership with the local communities, will provide an important mechanism to protect and enhance the outstanding resource values of the Eightmile River Watershed; and

WHEREAS, the *Eightmile River Wild & Scenic Study Committee* recognizes that full implementation of the Watershed Management Plan will require human and financial resources that may be beyond the capacity of the Town of East Haddam to provide and that full implementation of the Plan will require funding and technical support that may become available as a result of Wild & Scenic Designation; and

WHEREAS, the National Park Service was authorized, at the request of the local communities, to determine if the Eightmile River Watershed is eligible and suitable for inclusion in the National Wild & Scenic Rivers System; and

WHEREAS, the National Park Service will not own or manage any lands, will not create any new regulatory powers and will not have any control over local municipal boards and commission activities and actions associated with a Wild & Scenic designation.

NOW, THEREFORE, BE IT RESOLVED

1. The Town of East Haddam Board of Selectmen endorses designation of the Eightmile River Watershed as a component of the National Wild & Scenic Rivers System.
2. The Town of East Haddam Board of Selectmen endorses the purposes and goals of the Draft Eightmile River Watershed Management Plan.
3. The Town of East Haddam Board of Selectmen commits to being a partner and participant in the implementation of the Draft Eightmile River Watershed Management Plan.
4. The Town of East Haddam Board of Selectmen agrees that within 6-12 months of achieving an affirmative vote of support for Wild & Scenic designation at a town meeting they will begin the process of implementing Tier one tools and will establish a timeline in which to complete such a process. The commission will do this to the best of their ability however, the implementation of tools that require funding outside the normal expenditures of the town may not be pursued until or unless outside funding is secured. These proposed tier one tools include:
 - Adopting a River Protection Overlay Zone for all perennial streams and rivers in the Eightmile River Watershed that provides a 50 foot setback on small headwater streams, and a 100 foot setback on larger streams.
 - Making protection of important habitat blocks an open space conservation priority and being a partner in pursuit of federal funding to support such types of acquisitions.
 - Working with the Eightmile River Committee to establish local management tools that will support maintaining less than 4% impervious cover for the entire Eightmile River Watershed.
 - Requiring the CT DEP Stormwater Quality Manual to be used as guidance for the design, implementation and maintenance of all new and existing stormwater systems in each community.

- Completing and implementing a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems.
 - Adopting the University of Massachusetts guidance for watercourse crossings.
5. The Town of East Haddam Board of Selectmen will work on implementing the Draft Eightmile River Watershed Management Plan to the best of its abilities regardless of a Wild & Scenic Designation being achieved, recognizing that the implementation of tools that require funding outside the normal expenditures of the town may not be pursued until or unless outside funding is secured.

**INLAND/WETLANDS AND WATERCOURSES COMMISSION
TOWN OF EAST HADDAM
LAND USE OFFICE
(860) 873-5031
HOURS: Mon., Wed., & Thurs. 9AM-4PM / Tues. 9AM-7PM / Fri. 9AM-12 NOON**

April 4, 2006

Damon Hearne
Eightmile River Wild and Scenic Study Committee
Middlesex County Extension Center
P.O. Box 70
Haddam, CT 06438

Dear Mr. Hearne,

I am writing on behalf of the East Haddam Inland Wetlands and Watercourses Commission to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the Commissioners at their meeting on December 20, 2005.

Sincerely,



Randolph Dill, Chairman
East Haddam Inland Wetlands and Watercourses Commission

RD/jl

**East Haddam Conservation Commission
7 Main Street
P.O. Box K
East Haddam, CT 06423**

April 4, 2006

Damon Hearne
Eightmile River Wild and Scenic Study Committee
Middlesex County Extension Center
P.O. Box 70
Haddam, CT 06438

Dear Mr. Hearne,

I am writing on behalf of the East Haddam Conservation Commission to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the Commissioners at their meeting on March 7, 2006.

Sincerely,



John Gibson, Chairman
East Haddam Conservation Commission

**TOWN OF EAST HADDAM
PLANNING AND ZONING COMMISSION**

Town Office Building - P. O. BOX K
EAST HADDAM, CONN. 06423
HOURS: Mon., Weds. & Thurs. - 9AM - 4PM; Tues. - 9AM - 7PM; Fri. - 9AM - Noon
(860) 873-5031 - Fax (860) 873-5042

April 4, 2006

Damon Hearne
Eightmile River Wild and Scenic Study Committee
Middlesex County Extension Center
P.O. Box 70
Haddam, CT 06438

Dear Mr. Hearne,

I am writing on behalf of the East Haddam Planning and Zoning Commission to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the Commissioners at their meeting on January 10, 2006.

Sincerely,

Harvey Thomas

Harvey Thomas, Chairman
East Haddam Planning and Zoning Commission

JV/jl

CONSERVATION
COMMISSION

INLAND
WETLANDS
AGENCY



LYME TOWN HALL
480 HAMBURG ROAD
LYME, CT 06371
(860) 434-7733

April 19, 2006

Eightmile River Wild and Scenic Study Committee
c/o Anthony Irving
P.O. Box 1002
Lyme, CT 06371

Dear Anthony:

I am writing on behalf of the Lyme Conservation and Inland Wetlands Agency to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the Commissioners at their meeting on October 19, 2005.

Sincerely,

Paul Armond

Chairman, Conservation Commission and Inland Wetlands Agency

PLANNING AND ZONING
COMMISSION



LYME TOWN HALL
480 HAMBURG ROAD
LYME, CT 06371
(860) 434-7733

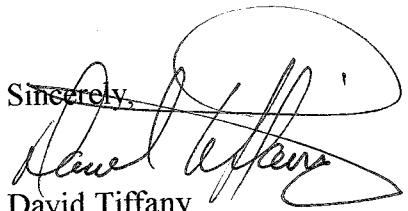
April 11, 2006

Eightmile River Wild and Scenic Study Committee
c/o Anthony Irving, Chairman
P.O. Box 1002
Lyme, CT. 06371

Dear Anthony,

I am writing on behalf or the Lyme Planning and Zoning Commission to confirm the Commissions support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by formal vote of the Commissioners at their meeting on October 11, 2005.

Sincerely,


David Tiffany

Chairman, Planning and Zoning Commission



May 22, 2006

Eightmile River Wild and Scenic Study Committee

Anthony Irving, Chairman

PO Box 1002

Lyme CT 06371

Dear Anthony,

I am writing on behalf of the Salem Inland Wetlands and Conservation Commission to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by a formal vote of the Commission at their meeting on December 12, 2005. Enclosed is a copy of the motion from that meeting.

Very truly yours,

George Ziegra, Chairman

Salem Inland Wetlands and Conservation Commission

Encl.

GZ:dm

270 HARTFORD ROAD • SALEM, CONNECTICUT 06420-3809



May 22, 2006

Eightmile River Wild and Scenic Study Committee
Anthony Irving, Chairman
PO Box 1002
Lyme CT 06371

Dear Anthony,

I am writing on behalf of the Salem Planning and Zoning Commission to confirm the Commission's support for the Eightmile River Watershed Management Plan and its recommendation to seek Wild and Scenic Designation. This position was taken by a formal vote of the Commission at their meeting on December 13, 2005. Enclosed is a copy of the motion from that meeting.

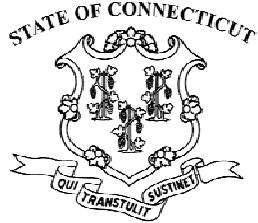
Very truly yours,


Hugh McKenney, Chairman
Salem Planning and Zoning Commission

Encl.

HM:dm

270 HARTFORD ROAD • SALEM, CONNECTICUT 06420-3809



House Bill No. 6414

Public Act No. 05-18

***AN ACT CONCERNING DESIGNATION OF THE EIGHTMILE RIVER
WATERSHED WITHIN THE NATIONAL WILD AND SCENIC RIVER
SYSTEM.***

Be it enacted by the Senate and House of Representatives in General Assembly convened:

Section 1. (NEW) (*Effective October 1, 2005*) (a) It is declared to be the policy of the state of Connecticut that the portion of the Eightmile River watershed which is the subject of the authorized study by the Eightmile River Wild and Scenic River Study Committee for purposes of designation as a national wild and scenic rivers system be preserved as provided for in the federal Wild and Scenic Rivers Act, Public Law 90-542, as amended.

(b) The Commissioner of Environmental Protection shall cooperate with all relevant federal, state and local agencies to provide for such designation and to implement any management plan developed in accordance with the federal Wild and Scenic Rivers Act. Upon the designation of the river watershed by Congress, the commissioner shall notify the joint standing committee of the General Assembly having cognizance of matters relating to the environment regarding any statutory changes necessary to implement the preservation and conservation of the river watershed in accordance with the federal Wild and Scenic Rivers Act. The commissioner shall cause a copy of

House Bill No. 6414

this section to be delivered to all United States Representatives and Senators representing Connecticut in the Congress of the United States.

Approved May 9, 2005

EIGHTMILE RIVER WILD & SCENIC COMMITTEE – TIER ONE

Water Quality

- Work to achieve Class A designations for all Class B waters in the watershed
- Implement a comprehensive water quality testing program to monitor key water quality parameters.

Watershed Hydrology

- Working with the local P&Z commissions, undertake a detailed assessment of current and potential imperviousness in each local watershed for each community.
- Establish a program to provide education and encouragement to private landowners regarding the importance of riparian buffers and the best management strategies that can be implemented voluntarily to ensure riparian buffer values are sustained.
- Complete scope of work for completion of all instream flow and groundwater modeling research.
- Work with the State to ensure surface and groundwater research and modeling approaches will benefit the agency's ability to make scientifically sound assessments of future diversion permit applications and support local land use commissions work when needed.
- Allocate adequate funding to complete necessary instream flow and groundwater modeling research. Identify and pursue funding partners to leverage and maximize Committee funds.
- Based on research and modeling efforts, work with the State to establish year round target flow levels for all perennial waterbodies in the Eightmile River Watershed.

EIGHTMILE RIVER WILD & SCENIC COMMITTEE – TIER Two

Cultural Landscape

- Create an up-to-date map of the culturally and archaeologically significant resources of the Eightmile River Watershed. This should include current and potential resources.
- Identify and pursue opportunities to add significant cultural and archaeological resources to the National Register of Historical Places, as well as pursue opportunities where appropriate to establish National or Local historic districts.
- Identify and pursue opportunities to add unique state roadways to the state scenic road program.
- Encourage local P&Z commissions to establish local scenic road programs if not already in place. Identify and pursue opportunities to add unique local roadways to the town scenic road program.
- Identify, map and describe exiting and potential archaeological sites within the riparian corridor for use in open space prioritization efforts and land use application reviews among other things.

Geology

- Develop accurate slope information for the watershed. Work with local P&Z to identify priority areas for protecting natural topographic features such as ridgelines.

- Create an up-to-date map of exceptional bedrock and glacial features within each community to be used in land use decision making and open space planning activities.

Water Quality

- Implement landowner education and outreach initiatives on the importance of riparian buffers
- Work to achieve Outstanding National Resource Water designation as described in the CT Water Quality Standards for all the waters of the Eightmile River Watershed.
- Implement landowner education and outreach initiatives regarding best management practices for lawns and landscaping related to minimizing non-point source pollution.
- Support and promote household hazardous waste collection to minimize potential sources of non-point source pollution.
- Promote use of U.S. Dept. of Agriculture's Natural Resource Conservation Service programs such as the Environmental Quality Incentive program (EQIP) and the Farm and Ranch Land Protection program (FRPP).

Watershed Hydrology

- Implement public education and outreach initiatives on the impacts of impervious surfaces.
- Prioritize land conservation efforts that support sustaining forest cover and natural vegetative cover.
- Work with the State, Landowners and other partners to identify and remove any remaining man-made dams that are clearly altering natural riverine hydrology causing an inconsistency with the overall hydrology goal where feasible and appropriate.
- Work with local P&Z commissions to establish and implement a capacity to map detailed landcover information and track changes on a regular basis.
- Develop a scope of work and implement an invasive species reconnaissance and removal program.
- Ensure all local land use commissions have accurate and current information regarding aquifer resources within the Eightmile River Watershed.
- If requested, provide technical support to towns in reviewing applications associated with earth extraction operations.
- Identify partners, such as USGS and CT DEP, along with funding to support the installation of a stream gauge and groundwater monitoring wells within the watershed for establishment of year-round baseline data on surface and groundwater conditions.
- Provide necessary data and information from research and monitoring efforts to local land use commissions to support their decision making processes and provide them with general education on the conditions within the watershed.
- Develop and implement education materials for public and private landowners regarding stream bank conservation issues, including educational information on stream morphology and appropriate strategies to address stream bank management.
- Establish a capacity to map detailed landcover information and track landcover changes on a regular basis. This includes tracking changes in the amount of developed area as well as the impacts of timber cutting activities.

Unique Species and Natural Communities

- Complete a comprehensive assessment and mapping of all rare species and communities within the Eightmile River Watershed. Establish a set of indicator species representing rare and potentially declining common species and natural communities throughout the watershed.
- Offer local towns technical support regarding the protection and management of rare species and communities
- Establish a monitoring program to assess change in the abundance, rarity and diversity of species and natural communities in the Eightmile River Watershed using the indicator species
- Establish an up-to-date and comprehensive map of unfragmented habitat blocks.
- Establish an ability to monitor changes in habitat block size.
- Work with local land use commissions to provide up-to-date information on habitat blocks, especially priority blocks, and the status of changes in block sizes.
- Work with CT DEP to identify opportunities to implement pertinent component's of Connecticut's Comprehensive Wildlife Conservation Strategy in the Eightmile River Watershed.
- Work with USDA NRCS to identify opportunities to leverage funding and technical resources from NRCS wildlife programs such as the Wildlife Habitat Enhancement Program (WHIP), the Environmental Quality Incentives Program (EQIP) and the CT DEP Landowner Incentive Program (LIP).
- Survey all watercourse crossings in the watershed to determine quality of connectivity. Establish a prioritized list of connectivity needs within the watershed. Work with local communities and the state to restore connectivity where practical and feasible.
- Complete a detailed inventory of invasive species in the Eightmile River Watershed.
- Create and implement an Invasive Species management plan following the goals established in Unique Species and Natural Communities Section 6.8.

LOCAL MUNICIPAL OPEN SPACE COMMITTEES – TIER ONE

Unique Species and Natural Communities

- Endorse the remaining unfragmented habitat blocks as high priority open space conservation areas through pertinent town planning documents such as the Town Plan of Conservation and Development and the Town Open Space Plan.
- Establish a land protection goal for each community and the watershed as a whole.
- Commit to working with other partners, such as local land trusts, the Nature Conservancy and the State to leverage resources and collaborate when opportunities arise to protect priority lands.
- Endorse support for federal funding assistance to help support such open space conservation actions. While the federal government will not own or manage any land associated with a Wild & Scenic designation, a designation may create an opportunity to access federal funds that local agencies could use to support open space conservation. Clearly stating such an interest in the Management Plan will be helpful in pursuing such funding resources.

Cultural Landscape

- Prioritize and pursue conservation of the important topographic features of the Eightmile River Watershed.

Water Quality

- Prioritize land conservation efforts that protect riparian corridors.

Watershed Hydrology

- Prioritize land conservation efforts that support sustaining forest cover and natural vegetative cover.

LOCAL MUNICIPAL OPEN SPACE COMMITTEES – TIER TWO

Cultural Landscape

- Identify exceptional cultural landscape or archaeological features as an important conservation priority in open space planning guidance.

Geology

- Identify exceptional topographic features, e.g. ridgelines, as an important conservation priority in open space planning guidance.
- Identify exceptional bedrock and glacial features as important conservation priorities in open space planning guidance.
- Implement use of the up to date map of exceptional bedrock and glacial features developed by ERWSC to help identify unique geologic features when planning open space conservation priorities.

Watershed Hydrology

- Pursue open space planning and acquisition of key parcels associated with the hydrologic well-being of the watershed, especially those associated with important aquifer and riparian areas.
- Identify important aquifers as priority land conservation areas.

LOCAL MUNICIPAL DEPT. OF PUBLIC WORKS – TIER ONE

Water Quality

- Complete and implement a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems.

LOCAL MUNICIPAL DEPT. OF PUBLIC WORKS – TIER TWO

Water Quality

- Implement municipal and state road construction and maintenance standards that protect riparian buffer function.
- Promote municipal and state road construction and maintenance standards, including salt and sand practices that minimize non-point source pollution.

Watershed Hydrology

- Work with the Eightmile River Committee to develop and adopt guidance and standards for addressing stream bank repairs along roadways. Includes guidance on when repairs are necessary and the preferred engineering and construction approaches to implement such repairs.

STATE DEPT. OF ENVIRONMENTAL PROTECTION – TIER ONE

Water Quality

- Make a formal determination on whether the waters of the Eightmile River Watershed are considered "high quality" surface waters consistent with the state Water Quality Standards.

Watershed Hydrology

- Work with the State to ensure surface and groundwater research and modeling approaches will benefit the agency's ability to make scientifically sound assessments of future diversion permit applications and support local land use commissions work when needed.
- Based on research and modeling efforts, work with the State to establish year round target flow levels for all perennial waterbodies in the Eightmile River Watershed.

STATE DEPT. OF ENVIRONMENTAL PROTECTION – TIER TWO

Watershed Hydrology

- Work with ERWSCC, Landowners and other partners to identify and remove any remaining man-made dams that are clearly altering natural riverine hydrology causing an inconsistency with the overall hydrology goal where feasible and appropriate.

Unique Species and Natural Communities

- Work with ERWSC to identify opportunities to implement pertinent component's of Connecticut's Comprehensive Wildlife Conservation Strategy in the Eightmile River Watershed

STATE DEPT. OF TRANSPORTATION – TIER ONE

Unique Species and Natural Communities

- Adopt The University of Massachusetts guidance for watercourse crossings, an approach that is used by Army Corps of Engineers (New England Region).

STATE DEPT. OF TRANSPORTATION – TIER TWO

Water Quality

- Implement municipal and state road construction and maintenance standards that protect riparian buffer function.
- Promote municipal and state road construction and maintenance standards, including salt and sand practices that minimize non-point source pollution.

Watershed Hydrology

- Work with the Eightmile River Committee to develop and adopt guidance and standards for addressing stream bank repairs along roadways. Includes guidance on when repairs are necessary and the preferred engineering and construction approaches to implement such repairs.

OTHER - TIER ONE

None

OTHER - TIER TWO

Cultural Landscape

- **Local Historical Societies** – Identify and pursue opportunities to add significant cultural and archaeological resources to the National Register of Historical Places, as well as pursue opportunities where appropriate to establish National or Local historic districts.

Water Quality

- **Local Municipal Selectman** – Ensure adequate town staffing for monitoring the implementation of erosion and sedimentation controls Emphasize the importance of not unnecessarily disturbing, harvesting or importing soils.

Watershed Hydrology

- **Landowners** – Work with the State and ERWSC to identify and remove any remaining man-made dams that are measurably altering natural riverine hydrology and/or are inconsistent with the overall hydrology goal where feasible and appropriate.



Outreach & Education

1. GOAL

The outreach and education goal for the Eightmile River Wild and Scenic Coordinating Committee is to engage the public including landowners, recreational users, towns and the state to be continually involved and active in protecting and enhancing the outstanding resource values of the Eightmile River Watershed.

2. THE IMPORTANCE AND PURPOSE OF OUTREACH & EDUCATION

Outreach and education plays a critical role in successfully achieving the goals of the Watershed Management Plan. Because this is an advisory plan, it can only be successful with the voluntary support and engagement of many stakeholders including landowners, municipalities, local land use commissions, state agencies and recreational users. Getting such stakeholders involved and active requires they care about the issue, they are motivated to participate and they know what actions to take. As such outreach and education efforts can be successful when it is made clear why the local resources are important to protect, specifically what actions need to be taken and ultimately what long-term benefits will accrue as a result of their efforts.

3. ACTIONS

The actions identified below are those to be taken by the Eightmile River Wild & Scenic Coordinating Committee and will provide a strong foundation for achieving the Outreach & Education goal. This action list will evolve. Opportunities to pursue and implement other actions or activities that are clearly effective in achieving the goal are strongly encouraged.

Periodic Newsletters/Publications

Publish a brief newsletter on a semi-annual basis to provide educational information on the Eightmile River Watershed's outstanding resource values, keep all stakeholders informed of committee activities, and report on the current quality and conditions of the Eightmile River Watershed. Publish other brochures or information books as necessary to support promotion of subjects such as key watershed management issues or unique natural, cultural or recreational aspects of the watershed.

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 a status of protection efforts.

Website

Establish and maintain a website that could include information such as background on the Wild & Scenic Rivers System, The Eightmile River Wild & Scenic Designation and access to related pertinent study documents, the Eightmile River Wild & Scenic Coordinating Committee, The Eightmile River Watershed Management Plan, opportunities to get involved, maps and images, related links, and key contacts.

Workshops/training

Offer 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 watershed management issues such as riparian corridor management and preventing polluted stormwater runoff.

Volunteer Opportunities

Create volunteer opportunities when practical such as vernal pool monitoring, invasive plant removal or stream walk surveys. Such opportunities are excellent ways to engage members of the local communities in discrete projects that provide an important service to the watershed ecosystem and a significant sense of accomplishment to the volunteers.

Publicity/Media

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 watershed's outstanding resource values and the management challenges it faces.

Local Schools

Engage local primary and secondary schools with place-based multi-disciplinary opportunities to promote the resources of the Eightmile River Watershed. 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 Eightmile and its resources as subject matter.

Land Use Commissions

As membership on local Planning and Zoning, Inland Wetlands and Conservation Commissions typically changes, regular communications from the ERWSCC will be key to keeping the partnership strong. Information regarding commission's roles and responsibilities, updates on management plan implementation, new resource management strategies and the status of outstanding resource value quality are some of the topics that should be shared with commissions on a regular basis.



Bumper sticker. Photo courtesy of C. Geise.

END NOTES/CLARIFICATION

NOTE: The following comments on the Watershed Management Plan were received from the Connecticut Department of Environmental Protection after the plan had been officially endorsed by the numerous land use commissions. While the Study Committee does endorse these comments, it was not able to incorporate them directly into the body of the report due to the timing issues and must state that these comments were not voted on by town boards and commissions or the town citizens.

Under Hydrology 6.2 Goals a. (p.39), please **substitute**: “**It is recognized that only DEP has the authority to regulated dams which by breaking away or otherwise might endanger life or property. Those dams not regulated by the State are subject to the local inland wetlands and watercourses commission’s jurisdiction.**” for “It is recognized that municipalities and the state do not have the authority to outright prohibit dams.”; and suggest changing “The intent of this goal is to provide a way to measure potential changes to overall quality of watershed hydrology.” to “*The intent of this goal is to use the absence of any new dams as an indicator as to the measure of hydrology intactness.*”

Under Hydrology 6.2 Goals c. (p.39), please **repeat or move up** the note under Hydrology 6.2.Tier Two Tools a. (p.39): “**Note: In some instances dam removal may not be considered the best alternative due to the potential degrading effects on established wetland systems outweighing the potential benefits associated with riverine habitat restoration.**”

Under Hydrology 6.2 Goals a. (p.39), **include** synonymous language used under Hydrology 6.3 Goals a. (i.e. surface or ground water diversions) (p.38) like: “**While this is the goal it is recognized no dam can be outright prohibited, except if regulated by FERC. All proposed dams have the right to be pursued through the appropriate regulatory process.**”

Under Hydrology 6.3 Goals b. (re: groundwater diversions) (p.40), **change**: “no detectable alteration” to “**no significant alteration**”

Under Water Quality 6.1 Tier Two Tools c. (p.49) AND Water Quality 6.6 Tier Two Tools c. (re: timber management regulations) (p.52), **change** “Local Municipal P&Z” to “**Local Municipality**”, **deleting** “P&Z”.

Under Water Quality 6.6 Tier Two Tools a. (re: fertilizers and pesticides) (p. 52), **insert** “**reduction and**” before “elimination of”.

Under Water Quality 6.6 Tier Two Tools h. (p.53), **delete** “**Removal**” from “Residential Underground Storage Tank Removal Regulation” and **make** “**Regulation**” plural.

Under Water Quality 6.6 Tier Two Tools l. (p.53), **change** “EQUIP” to “**EQIP**”; also make “Ranch Land” one word - “Ranchland”, and capitalize “program” as in “Farm and Ranchland Protection Program”.

Under Water Quality 6.6 Tier Two Tools m. (re: agriculture) (p.53), **change** “from such impacts” to “**from such practices**”.

Under Water Quality 6.6 Tier Two Tools d. (p.52), “**It is recognized that the state Dept. of Transportation currently has a draft stormwater management plan submitted to CT DEP for review in preparation of pursuing a Phase II Stormwater Management Permit.**”, in **substitution** of “It is recognized that the state Dept. of Transportation presently has a draft stormwater management plan the [that] meets the requirements of the CT DEP Phase II stormwater management MS4 general permit.”

Under Administrative Framework - Responsibilities 3. (re: notice of permit applications) (p.29), add "and watercourses" after "inland wetlands" (the complete name), and delete "and stream channel encroachment", because there are none in the Eightmile Watershed.

NOTE: The following footnotes were added to address questions regarding specific points of the management plan. As in the above DEP comments, these questions and requests for clarification arrived too late to include in the officially endorsed document but are included here for the sake of clarity and transparency. While the Study Committee does endorse these endnotes, the additions were not endorsed by the land use commissions or town citizens.

Page 6 & 26 (first paragraph) – *Management Plan partners, including local communities and the state, while not expected to implement all the recommended tools if a designation does not occur are strongly encouraged to implement those parts of the plan that can be done without undue stress on human or financial resources.*

Endnote = This is not intended to imply that if designation does occur partners are to implement all recommended tools.

Page 27 Responsibilities – **1. Implement the Eightmile River Watershed Management Plan** – *ERWSCC will be the lead organization in ensuring the implementation of the plan occurs and the outstanding resource value goals are achieved.*

Endnote = It is recognized ERWSCC has no formal authority and cannot guarantee the implementation of the management plan or achievement of the outstanding resource value goals.

Page 38 – *Recommended Tier One Tools - a. Local Municipal P&Z – Each community adopts maximum impervious surface limits of 10% per local watershed and 4% for the Eightmile River Watershed as a whole.*

Endnote = It is recognized that local communities cannot influence impervious cover in portions of local basins or areas of the Eightmile River Watershed that are located in neighboring communities. The effectiveness of this tool relies on the voluntary cooperation of the Eightmile communities working together to achieve implementation.

Page 38 – *Recommended Tier One Tools – b. Local Municipal P&Z and Eightmile River Committee - Working with the Eightmile River Committee, undertake a detailed assessment of current and potential imperviousness in each local watershed for each community.*

Endnote = ERWSCC will lead the coordination for pursuing the implementation of this tool and with the guidance and support of the local land planning & zoning commission be responsible for undertaking the assessment component.

Page 52 – *6.6 Tier One Tool c. Local Municipal P&Z and Department of Public Works – Complete and implement a Stormwater Management Plan for each municipality's stormwater system as described in the State's General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. See enclosed "General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems – Section 6. Development of Stormwater Management Plan" for guidance on the development of the plan.*

Endnote = It is recognized the financial resources needed to implement this tool would be provided by ERWSCC based on availability and as such will dictate the timeframe in which this tool can be accomplished.

Page 60 – *4.b No new roads, powerlines, or other fragmenting infrastructure which completely divides any priority block (Blocks 1 through 7 and 9 of the 16 blocks identified in the above referenced map) into two or more blocks. Exceptions for instances here fragmented areas of up to 5 acres occur.*

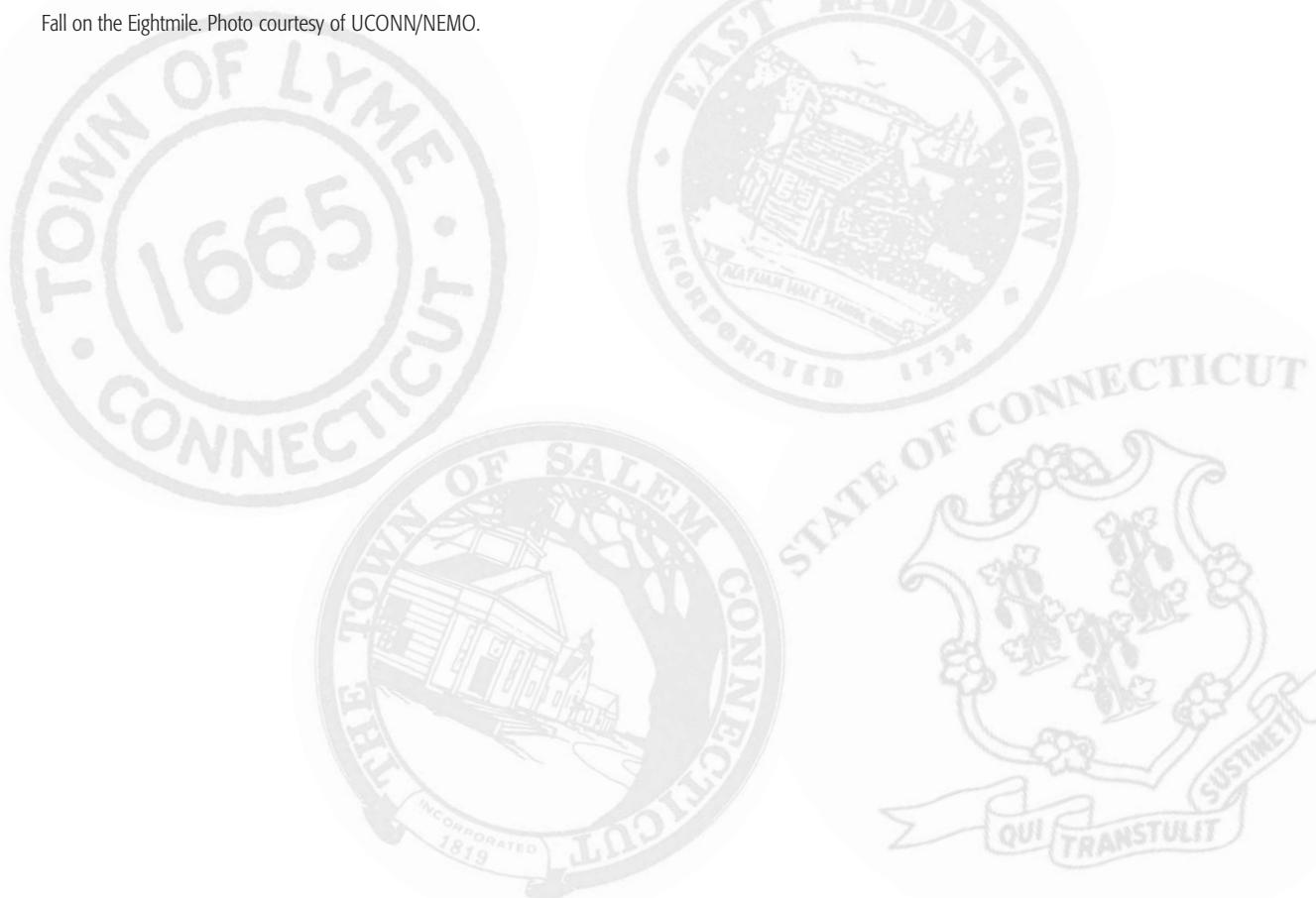
Endnote = No priority blocks are located in the proposed route (as of December 2005) for the extension of Route 11.



Endorsements for the Eightmile River Watershed Management Plan and Wild & Scenic Designation



Fall on the Eightmile. Photo courtesy of UCONN/NEMO.

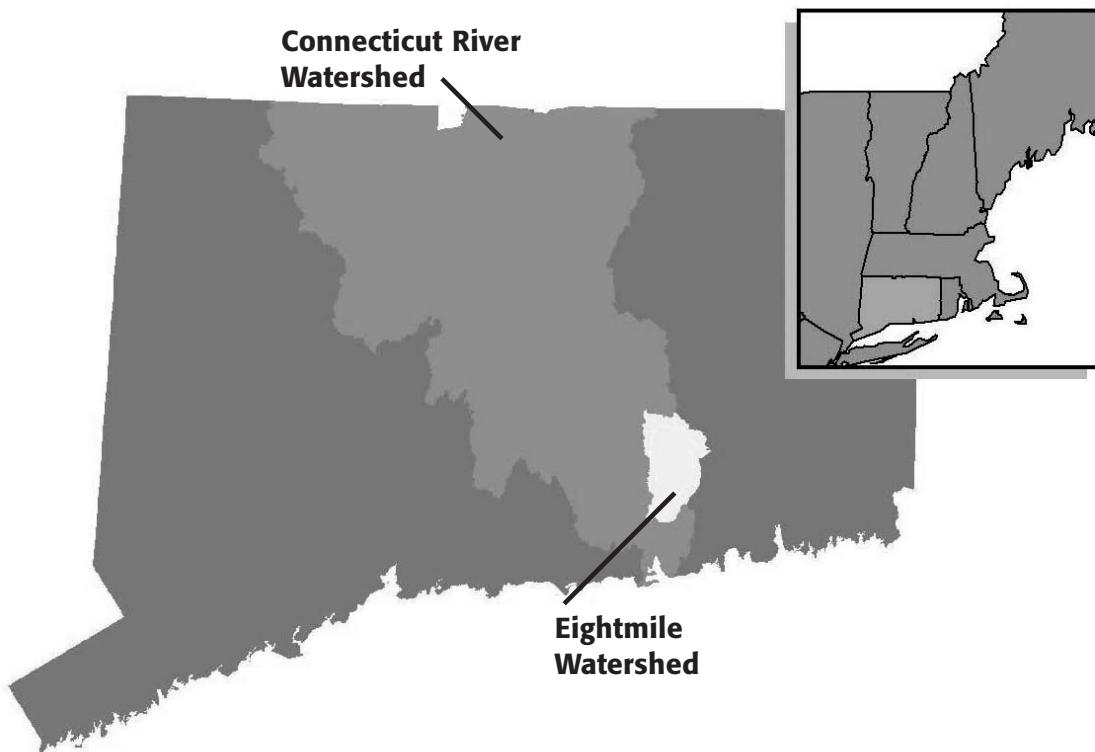




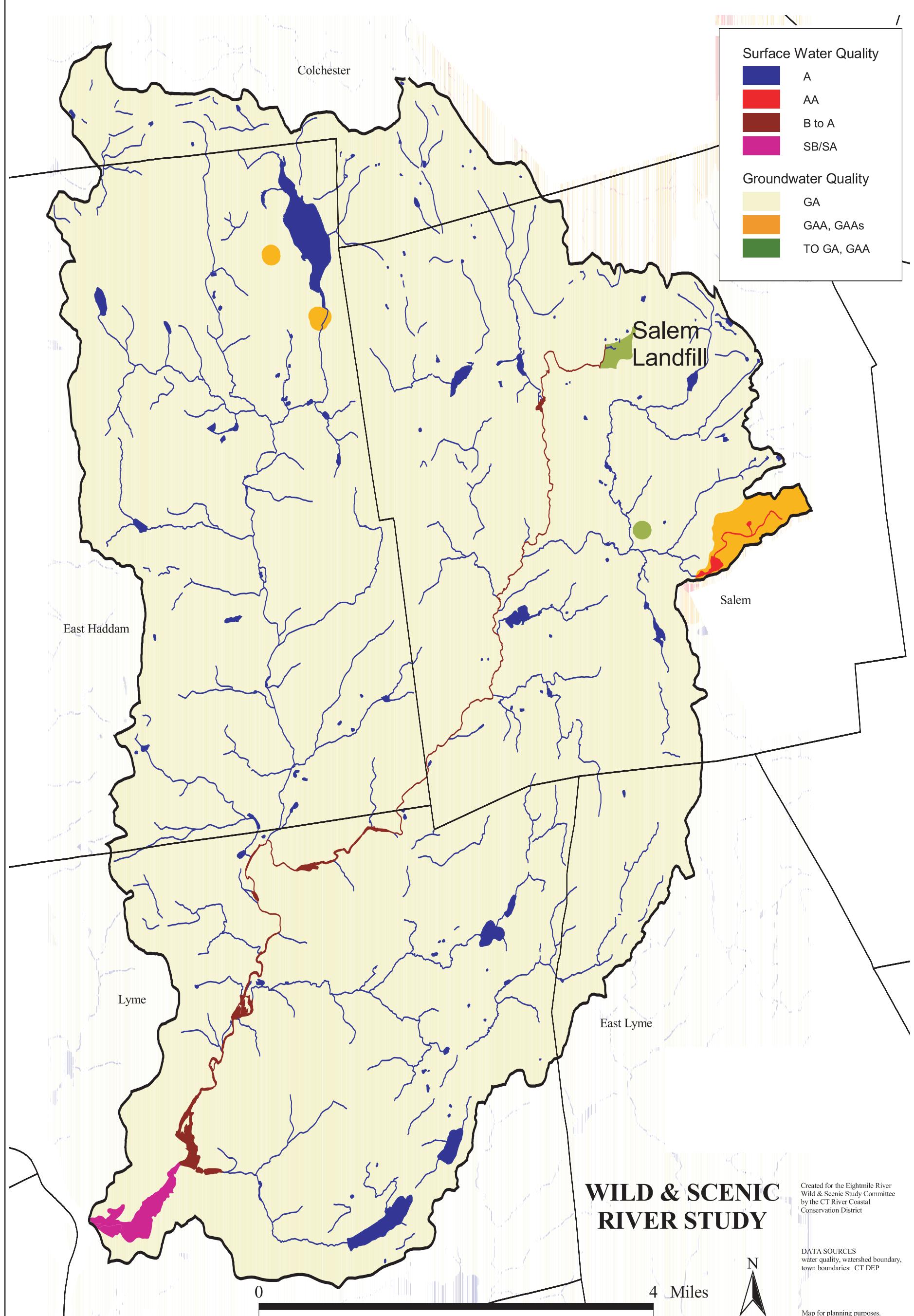
Eightmile Watershed Maps

These maps were created by the Connecticut River Coastal Conservation District (CRCCD) in Middletown, CT under direction of the Eightmile River Wild and Scenic Study Committee. In addition to the primary data and analysis created for this study, data for these maps were provided by various entities including but not limited to: CT DEP, The Nature Conservancy, Natural Resource Conservation Service, US Geological Survey, Center for Land Use Education and Research at UCONN, and the towns of East Haddam, Lyme and Salem.

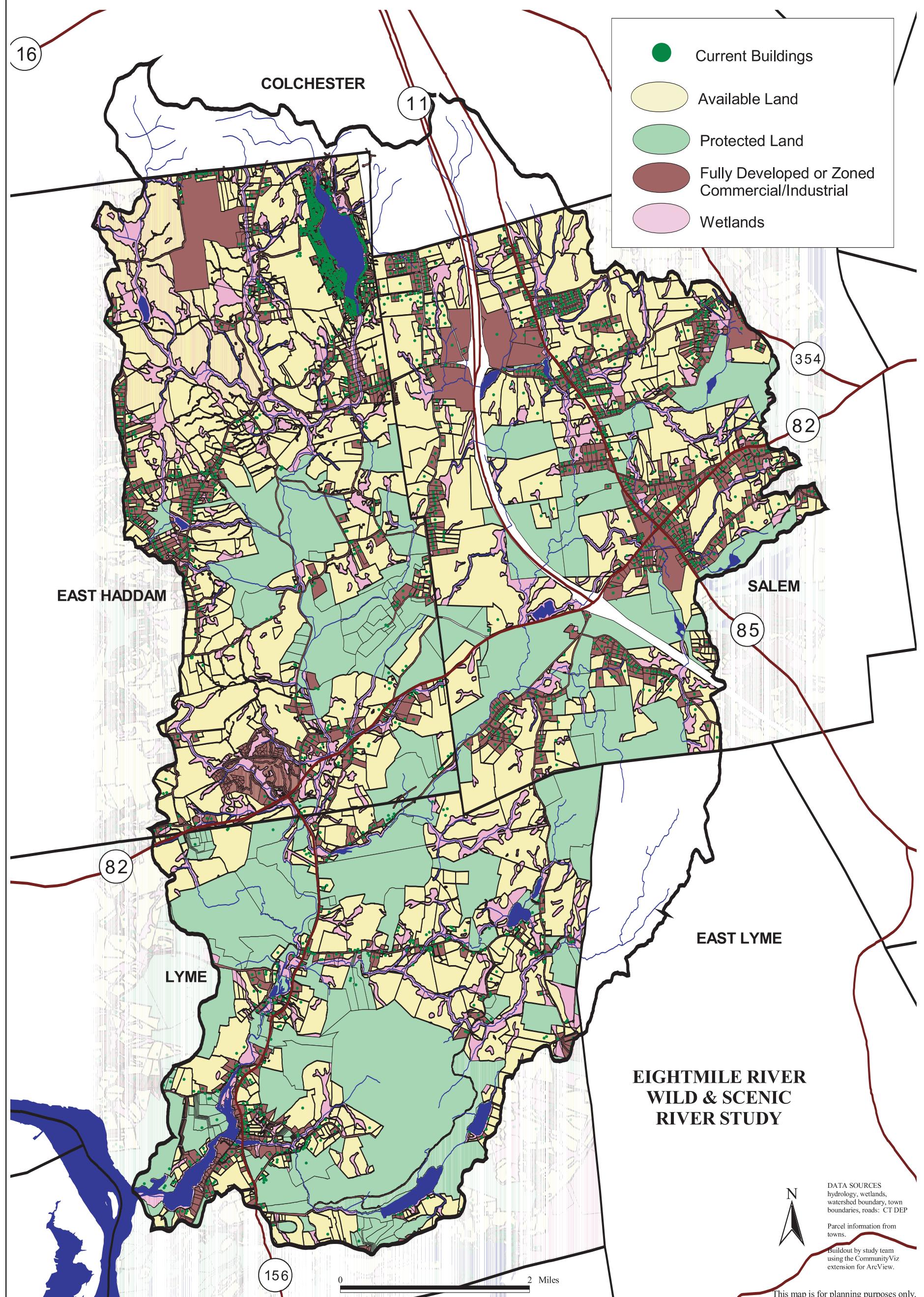
The location of feature boundaries shown on these maps are approximate and are intended for planning purposes only. This map is not intended for legal, engineering or survey purposes.



Water Quality Classifications



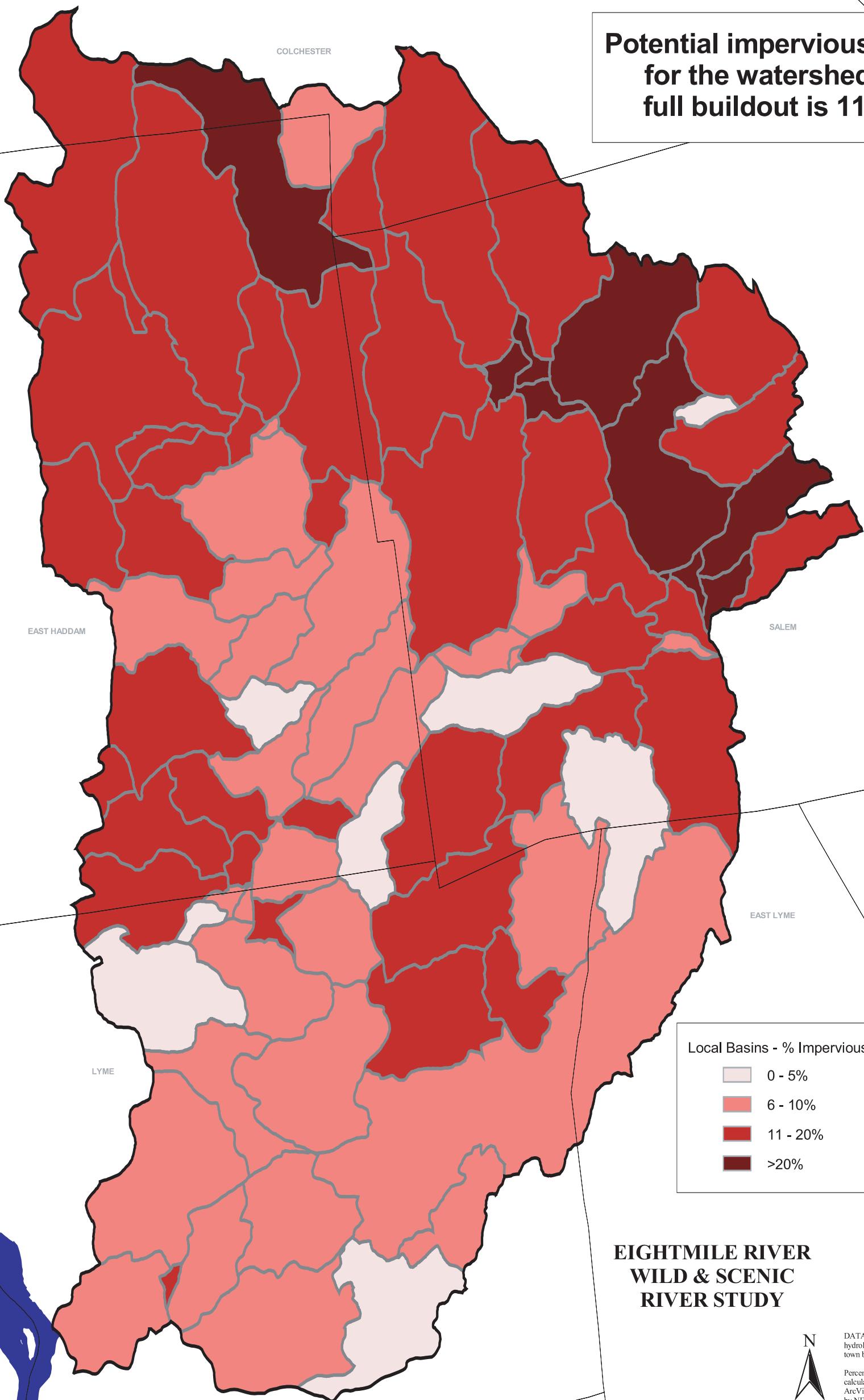
Remaining Buildable Land



MAP 16

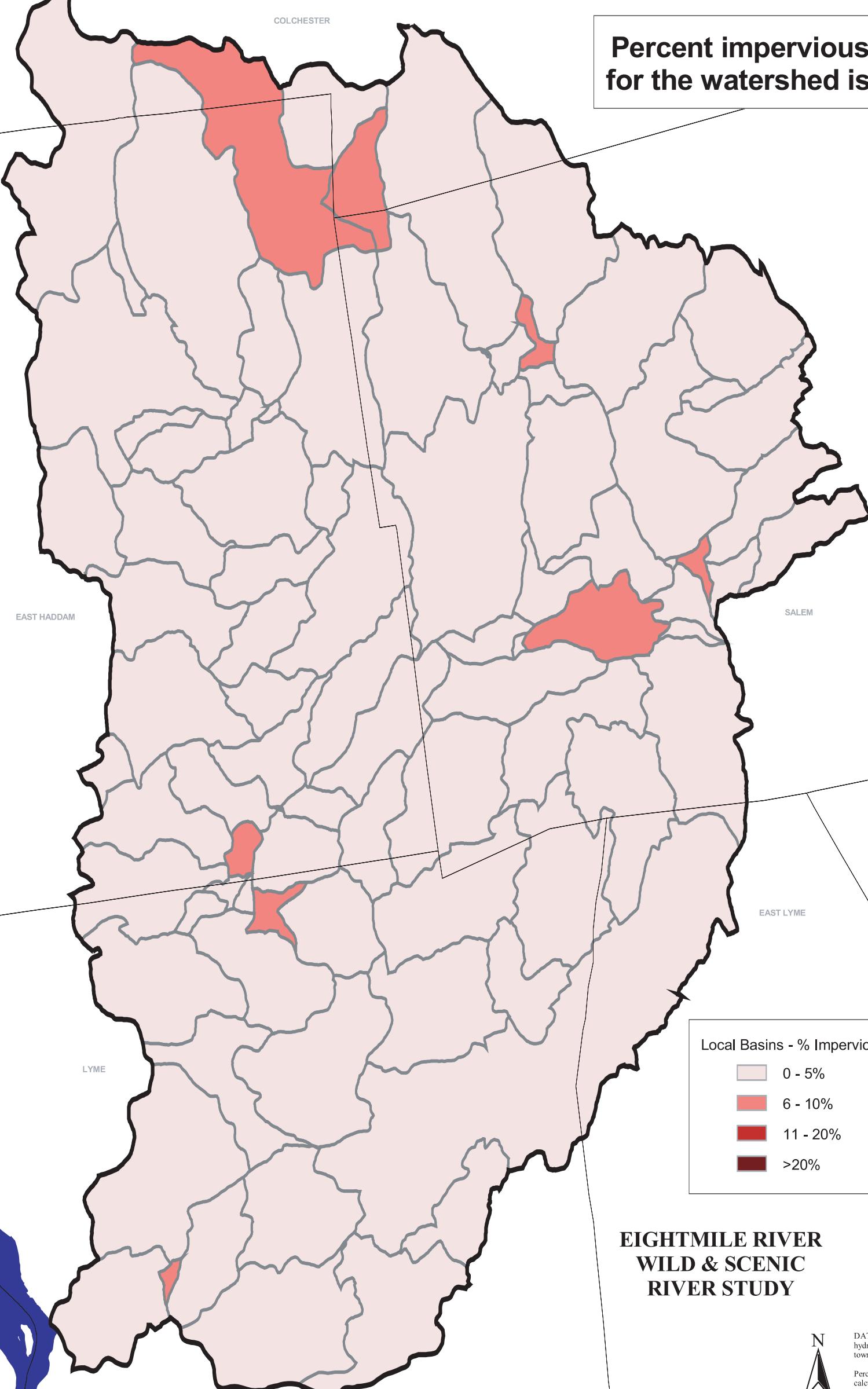
Potential Impervious Cover at Full Buildout

Potential impervious cover
for the watershed at
full buildout is 11.8%



Current Impervious Cover

Percent impervious cover
for the watershed is 2.97%



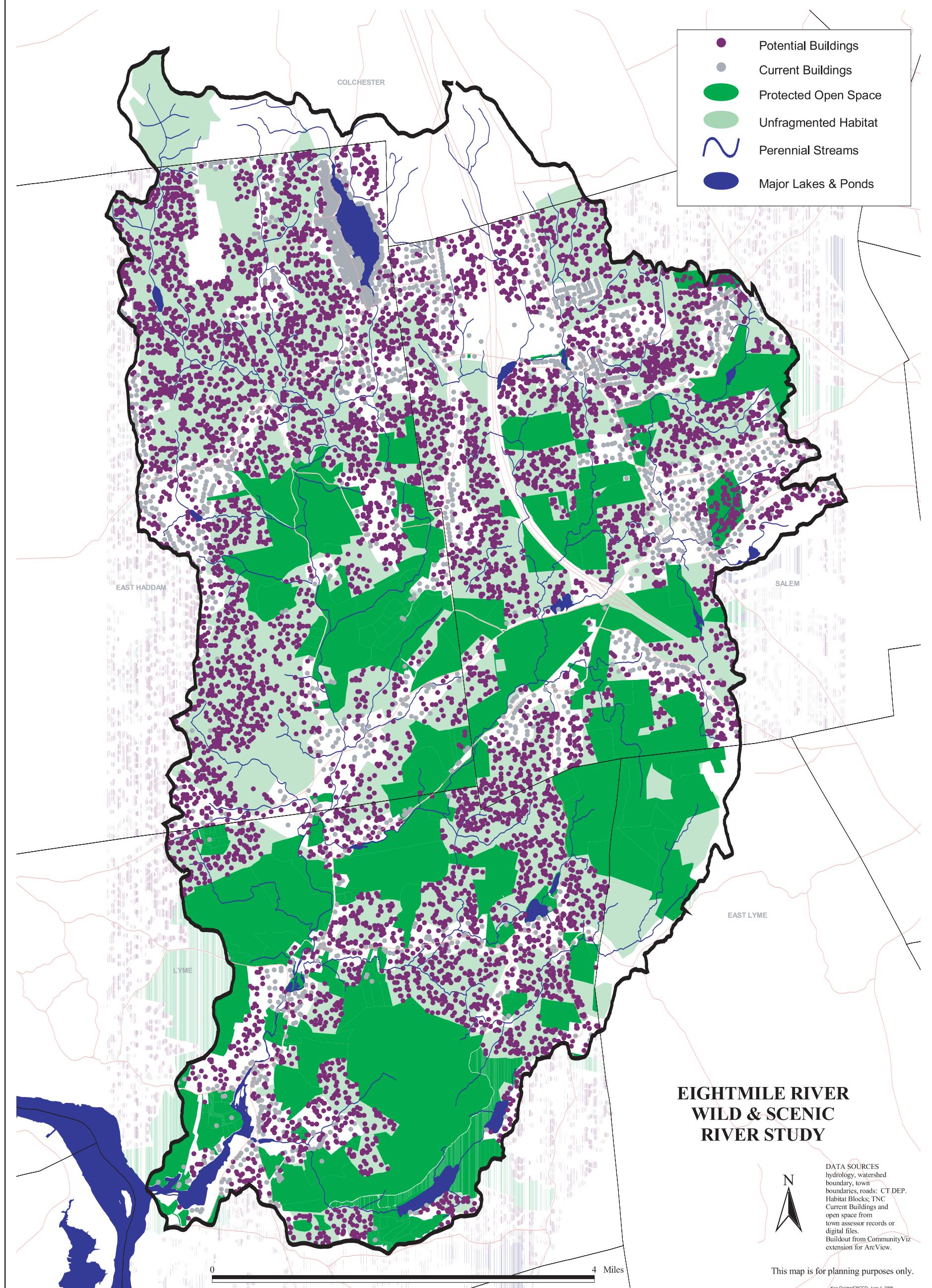
EIGHTMILE RIVER WILD & SCENIC RIVER STUDY

N
DATA SOURCES
hydrology, watershed boundary,
town boundaries: CT DEP

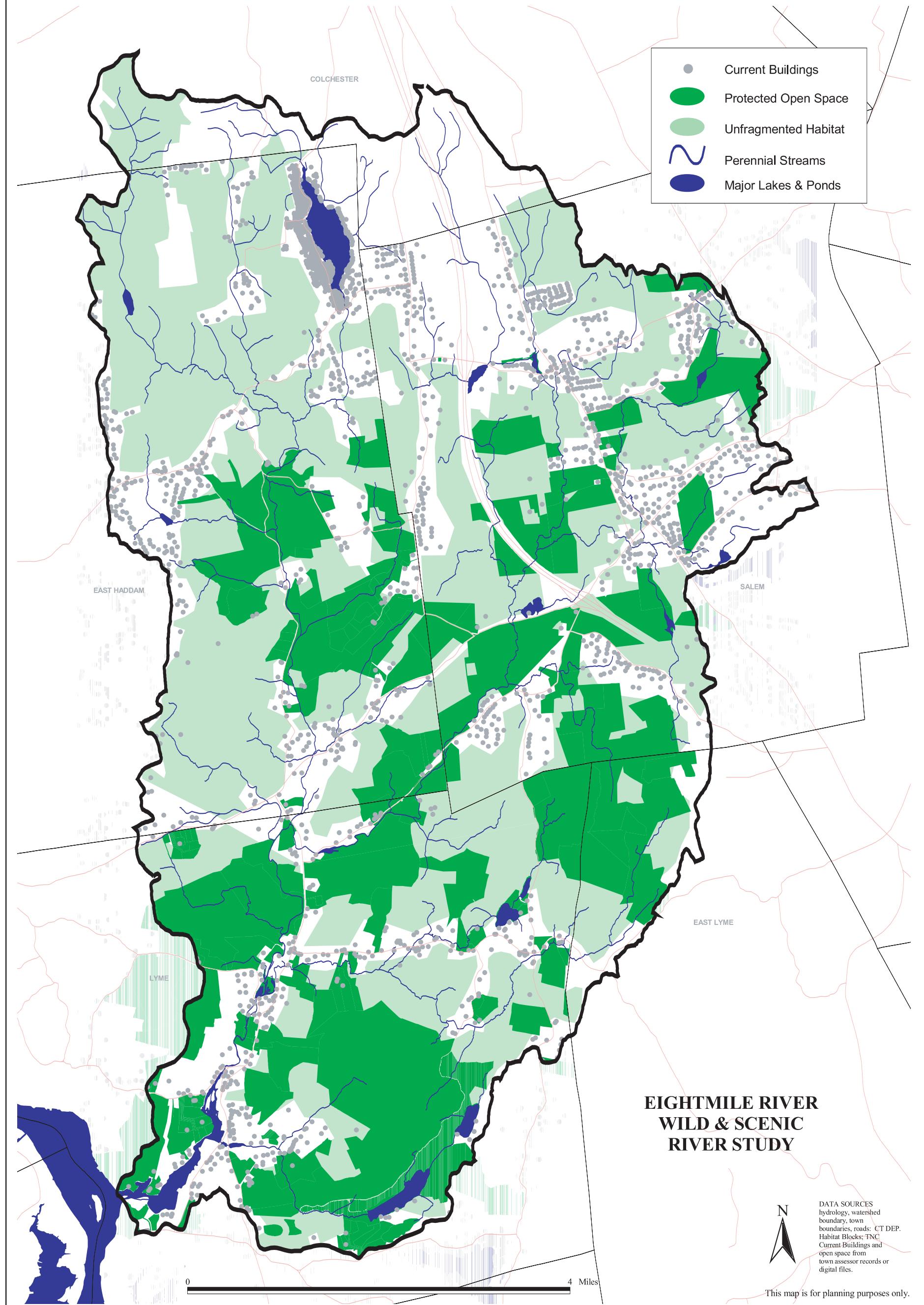
Percent of impervious surface
calculated with ISAT extension for
ArcView 3.3. Coefficients revised
by NEMO for the 2002 Land Cover.

This map is for planning purposes only.
Ken Geiser/CRCCD: June 1, 2006

Habitat Blocks and Protected Open Space with Current Buildings and Potential Buildings at Full Buildout

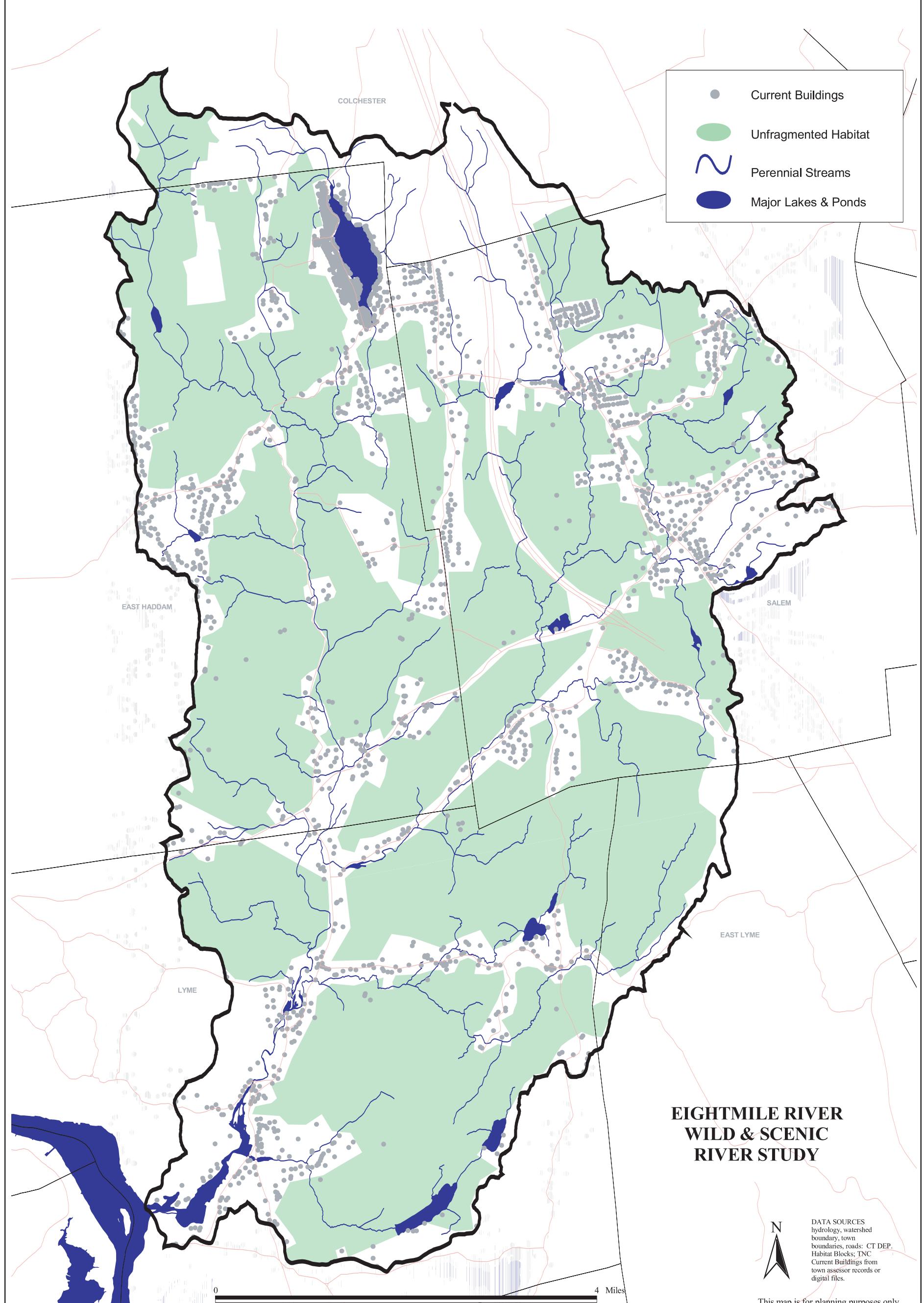


Habitat Blocks and Protected Open Space with Current Buildings



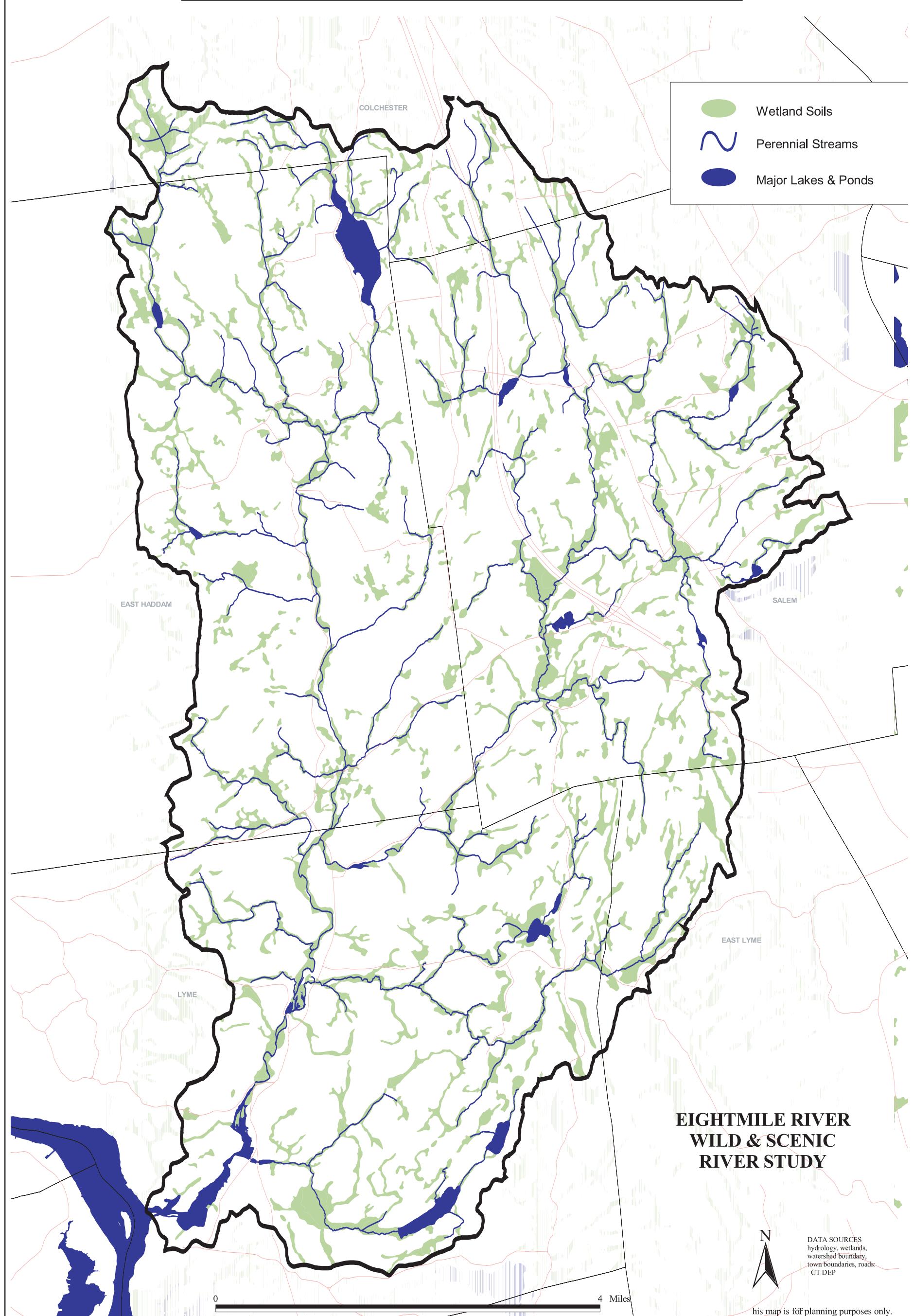
MAP 12

Habitat Blocks and Current Buildings

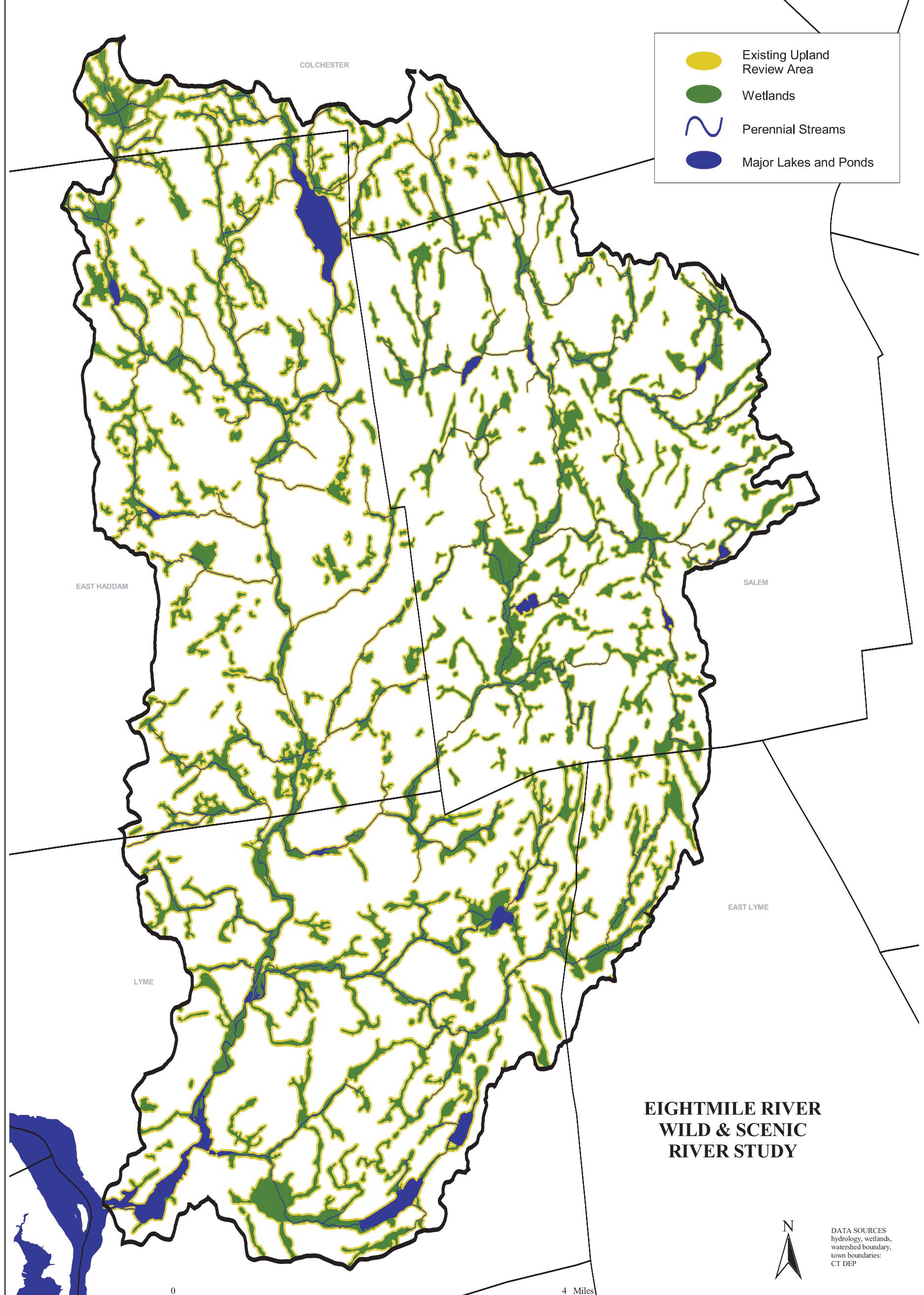


MAP 11

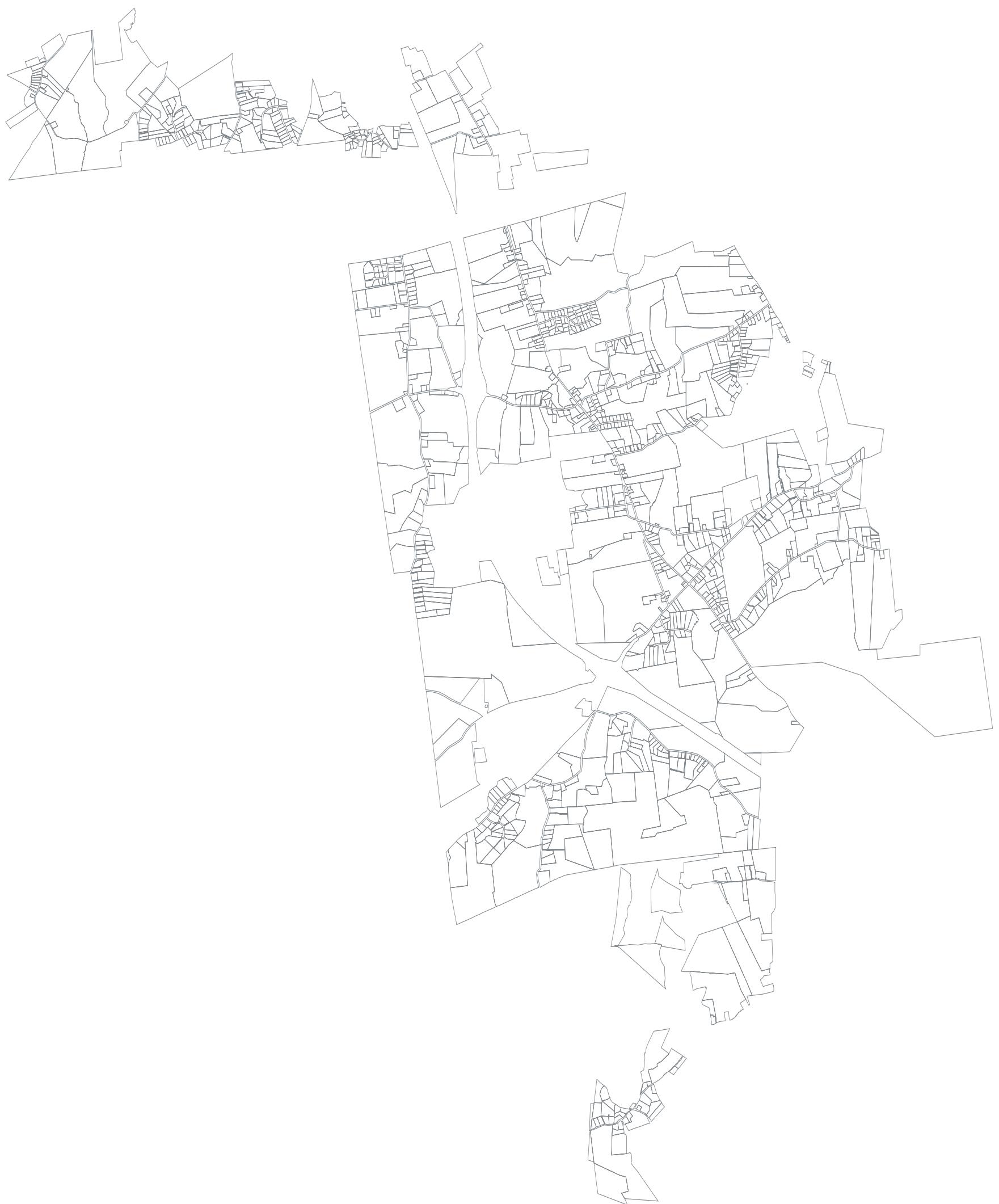
Wetlands and Watercourses



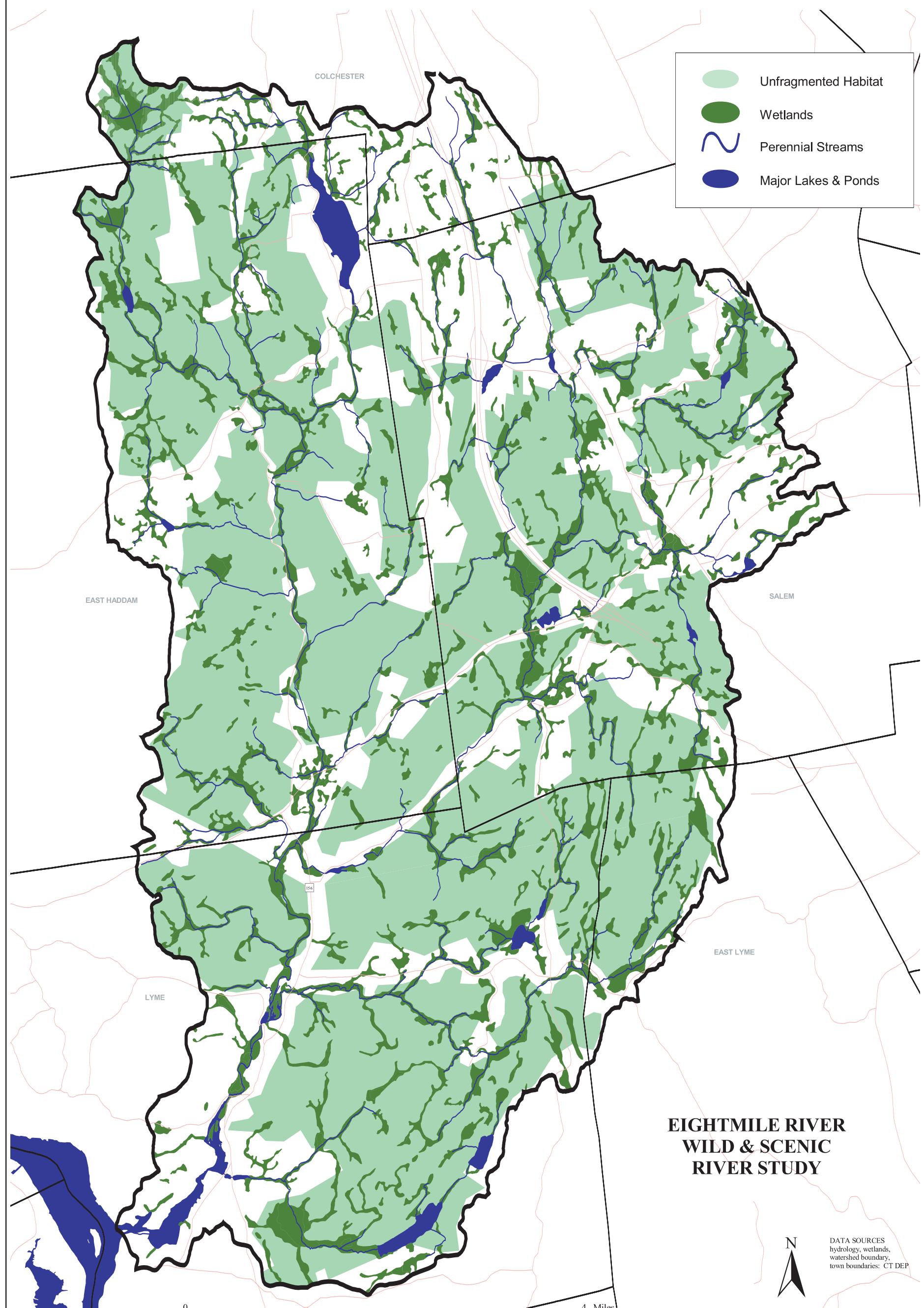
Existing Municipal Upland Review Areas



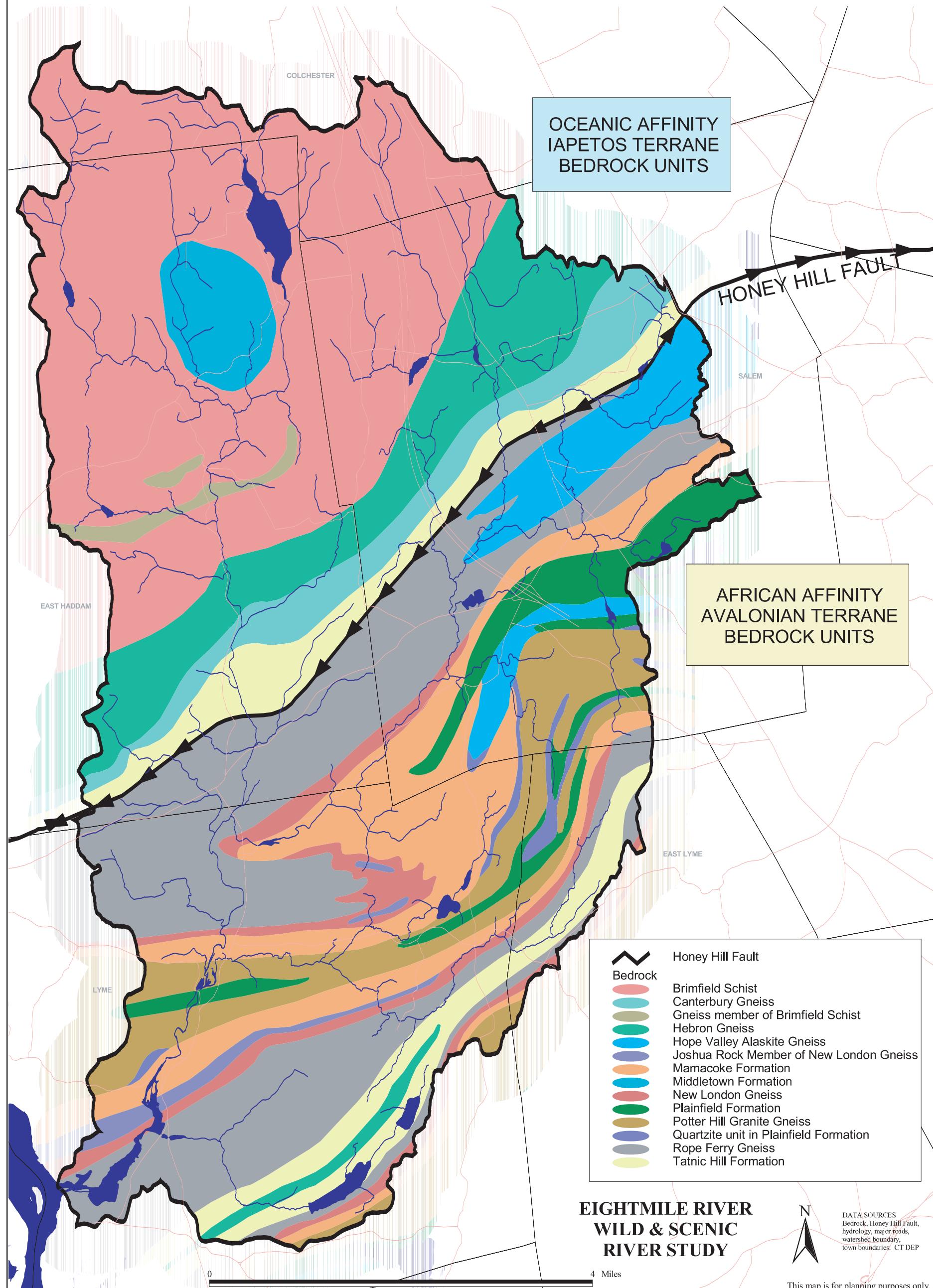
Proposed River Protection Overlay Zone



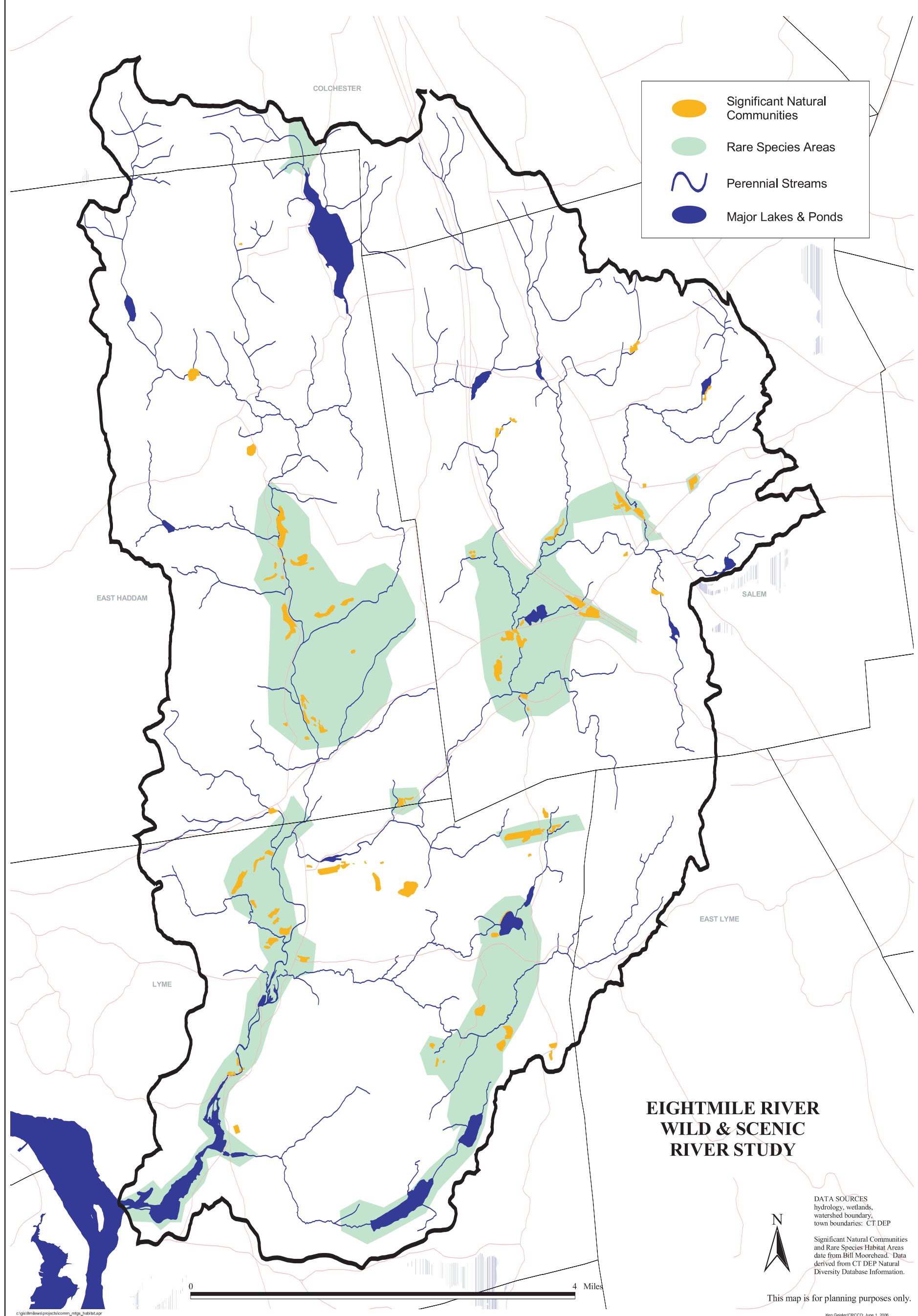
Intact Ecosystem



Bedrock Geology



Rare Species Areas & Significant Natural Communities



MAP 5

Habitat Types

