Upper Missisquoi and Trout Rivers

Wild and Scenic Study Management Plan

March 2013

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Front Cover Photo Credits

Main Photo: Missisquoi River – Dan Moriarty, courtesy of the Missisquoi River Basin Association (MRBA)

First Row: John Little Paddling the Missisquoi – Ken Secor; Covered Bridge – John Selmer; Fishing the Trout – Brenda Elwood; Moose near the Hopkins Covered Bridge – Frank Wirth

Second Row: Nice Buffer/Floodplain – Shana Stewart Deeds; Paddling the Missisquoi – Shana Stewart Deeds; Bakers Falls on the Missisquoi – Jonathan and Jayne Chase; Fog on the Missisquoi – Mary Alice Brenner; Behind the Monastery on the Missisquoi – Ave Leslie

Inside Front Cover:
Missisquoi River, Orleans County – Art Bell; flyover provided by Lakeview Aviation

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Inside Back Cover:
Missisquoi River, Franklin County – Art Bell; flyover provided by Lakeview Aviation.

Back Cover:
John Little's Boat on the Trout River – Art Bell

Upper Missisquoi and Trout Rivers Management Plan

The Upper Missisquoi and Trout Rivers Wild and Scenic Management Plan is now available on our website (www.vtwsr.org and hard copies in the Town Clerks' offices). This is a non-regulatory Plan summarizing the information collected over the three year study by the locally appointed Study Committee, illustrating examples of management success stories in our region, and encouraging the voluntary recommendations which the Study Committee feels will maintain the Missisquoi and Trout Rivers in healthy condition. Should designation occur, it will be based on this locally-developed Management Plan and would not involve federal acquisition or management of lands.

The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee is pleased to present its Management Plan for the upper Missisquoi and Trout Rivers for community review. This Management Plan represents more than three years of study and planning by the Study Committee. This followed the enactment of Public Law 111-11 by the U.S. Congress in March 2009, which called for a Wild and Scenic Rivers Study of the two rivers. The sections being recommended for designation include: the Missisquoi River from the confluence of Burgess Branch and the East Branch of the Missisquoi in Lowell to the Canadian border in North Troy (excluding the property and project area of the Troy and project area of the North Troy Hydroelectric Facilities), from the Canadian border in Richford to the beginning of the project area of the Enosburg Falls Hydroelectric facility; and the Trout River from the confluence of Jay and Wade Brooks in Montgomery to when it joins the Missisquoi in East Berkshire.

The Study Committee, made up of representatives from the ten municipalities in the Study area, worked closely with local citizens, municipal officials, regional planners, resource experts, state agency staff and the National Park Service to gather a host of information. This information about the many resources and values associated with the upper Missisquoi and Trout Rivers was compiled by the Committee and developed into the draft Management Plan. This Plan compiles the Committee's findings along with input from interested citizens, and makes recommendations to help protect and preserve the rivers' values for future generations.

The Study Committee found that our communities cherish our rivers and surrounding valleys for a variety reasons. These include their agricultural heritage, rural character, quality waters, recreational opportunities, scenic views, traditional way of life, history and diverse natural resources. Many of these resources are unique or outstanding at a local, state and national level, sufficiently so to qualify the upper Missisquoi and Trout Rivers for designation as national Wild and Scenic Rivers should the local communities so desire. Perhaps most importantly, the Committee found a strong desire among a wide diversity of folks to preserve the attributes that contribute to the character of the river valleys and the quality of life

in the region including: the working landscape, healthy farms and forests, good water quality, vibrant communities, and recreational opportunities.

With regard to potential Wild and Scenic River designation, the Study Committee believes that designation as a Partnership Wild and Scenic River, based on implementation of this Draft Plan through a locally-based Committee (like the Study Committee), can be an important positive contributor to our rivers and our communities. The goal of this Partner approach is to maintain local governance and control of the rivers and their valleys; it would **not** involve federal acquisition or management of lands.

This Draft Management Plan presents a series of recommendations that can be voluntarily implemented by area residents, riverfront landowners, local municipalities, and partnership state and federal agencies to help protect these river -related resources and maintain the quality and way of life valued by so many people. This Draft Plan also includes detailed information about National Wild and Scenic River designation through the Partnership approach.

Over the coming months, the Study Committee will continue to engage in a dialogue with the Study area communities about the Plan, its recommendations, and potential Wild and Scenic designation. This dialogue will culminate with Town Meeting votes, March 2013, on both the Plan and Wild and Scenic designation. The Study Committee will only act to recommend designation if the Management Plan and Wild and Scenic status are supported by those community votes. 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 and Scenic Study process. Regardless of whether or not the upper Missisquoi and Trout Rivers become part of the National Wild and Scenic River System, the Committee welcomes and encourages involvement by everyone at all levels to realize a shared vision for these incredible rivers.

Please contact the Study Committee with your questions and comments on this Management Plan, or on Wild and Scenic designation. The final Management Plan will be available prior to the town meeting votes on our website, and will also be available in hard copy in each Town Clerk's or Village Manager's office.

Thank you. Sincerely,

The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee
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Upper Missisquoi and Trout Rivers Management Plan

Prepared by the Wild and Scenic Study Committee

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Special thanks to previous Committee members:
Sue Brassett, Jayne Chase (Treasurer), Hib Doe, Bob Johnson and George Olio

Additional information and requests for copies of this plan (paper or electronic) are available from our website: www.vtwsr.org or by sending a request to info@vtwsr.org

For further information about the Wild and Scenic River Study or this Management Plan you may contact your local representative to the Study Committee or:

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Acknowledgements

This Study would not have been possible without the commitment and of many, especially the Study Committee appointees who volunteered their time for over three years.

The Study Committee wishes to acknowledge the assistance of the many individuals and organizations listed below. We apologize for any unintentional omissions.

The community members, Selectboards, Town Clerks, Conservation Commissions and Historical Societies in the ten municipalities in the Study Area (Berkshire, Town of Enosburgh, Village of Enosburg Falls, Jay, Lowell, Montgomery, Village of North Troy, Richford, Westfield, and the Town of Troy). We also appreciate the use of facilities in each of the municipalities for our monthly meetings.

The partnership organizations who participated in the Study especially:

Missisquoi River Basin Association: John Little and Cynthia Scott, and MRBA members important to the establishment of this Study - Anne McKay, Chris O'Shea, and Wendy Scott

National Park Service: Jamie Fosburgh; Jim MacCartney

Northwest Regional Planning Commission (NRPC): Catherine Dimitruk; Bethany Remmers

VT Agency of Agriculture, Food, and Markets (VAAFM): Sylvia Jensen

VT Department of Environmental Conservation (DEC) - Rick Hopkins, Cathy Kashanski, and Staci Pomeroy

VT Federation of Sportsmen's Clubs: Bill Leipold

VT Traditions Coalition: Robert Qua

Rolf Anderson for his technological assistance, and website management

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Joyce Kennedy Raymes (Study Coordinator of the Lower Farmington River/Salmon Brook Wild & Scenic Study) for her Wild and Scenic input

Kristen Sharpless for her contribution to the bird protections

The many speakers at our Study Committee meetings and reviewers of this Plan without whom this Plan would not be possible.

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Figure 1. Site of the Hectorville Bridge, Gibou Road. *Photo by Shana Stewart Deeds.*

Executive Summary

Overview

The Upper Missisquoi and Trout Rivers are valued by local communities that recognize the unique resources associated with them. This Management Plan (Plan) was created during a three-year study by the locally-appointed Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee to explore the possible designation of the rivers under the National Wild and Scenic Rivers System. This Management Plan is intended to serve as the framework for how the rivers will be managed in the event that they are designated as Partnership Wild and Scenic Rivers. Such a partnership is where local, state and federal interests all voluntarily agree to participate in the Plan's implementation and the realization of its goals. Such an implementation through Wild and Scenic designation potentially offers a net financial gain for municipalities and local partners as costs associated with implementing the Plan are to be funded through federal monies (subject to Congressional approval) allotted for that purpose. Regardless of designation, the Plan is intended to be a valuable resource and important tool for citizens, local organizations and state and local officials concerned with managing, protecting and enhancing the upper Missisquoi and Trout Rivers and the special resources associated with them.

National Wild and Scenic Rivers System

The National Wild and Scenic Rivers System was established by Congress in 1968 following a decade of widespread dam building and hydroelectric development. The Wild and Scenic Rivers Act (Public Law 90-542; 16 U.S.C. 1271) was enacted to balance this dam building with the preservation of the free-flowing character and outstanding features of some of the nation's most beloved rivers. As of April 2012, there are 203 rivers in the National System encompassing 12,598 miles (this is less than ¼ of 1% of our nation's rivers). This includes eight designated rivers in New England (with another under study), but none in Vermont as the Upper Missisquoi and Trout Rivers Wild and Scenic Study is the first of its kind in the State.

With the exception of the Allagash River in Maine, all of the designated Wild and Scenic Rivers in New England are called Partnership Wild and Scenic Rivers. Partnership Rivers are a subset of the National System that flow through land predominantly held in private ownership or by state and local government. They are managed through partnerships among the adjacent communities and the National Park Service. Partnership Wild and Scenic Rivers have a management approach that sets them apart from the other rivers comprising the National System. Their common principles include:

- No federal ownership or management of lands (federal ownership is excluded by Congress)
- Administration through post-designation Advisory Committees comprised of local representatives (much like the Study Committee)
- Land use governed by existing local municipalities and state laws and regulations
- River management plans locally developed and approved prior to federal designation
- Management plans form the basis of the designation and guide subsequent management
- Management responsibilities are shared among local, state, federal, and nonprofit partners
- Voluntary participation is essential to the partnership and viewed as the key to success

Upper Missisquoi and Trout Rivers Study

The Wild and Scenic Study of the upper Missisquoi and Trout Rivers (Study) was initiated in 2009 following passage of a bill introduced by the Vermont Congressional delegation at the request of local advocates. The bill was accompanied by letters of support from all ten municipalities within the proposed Study area (Berkshire, Enosburg Falls, Enosburgh, Jay, Lowell, Montgomery, North Troy, Richford, Troy, and Westfield). The bill was signed into law by President Barack Obama on March 30, 2009 (Public Law 111-11); it authorized a

Study of three segments of the Missisquoi and Trout Rivers in Vermont. The Study area includes the approximately 25-mile segment of the upper Missisquoi from its headwaters in Lowell to the Canadian border in North Troy, the approximately 25-mile segment from the Canadian border in East Richford to Enosburg Falls, and the approximately 11-mile segment of the Trout River from its headwaters to its confluence with the Missisquoi River. The sections being recommended for designation include: the Missisquoi River from the confluence of Burgess Branch and the East Branch of the Missisquoi in Lowell to the Canadian border in North Troy (excluding the property and project area of the Troy and project area of the North Troy Hydroelectric Facilities), from the Canadian border in Richford to the beginning of the project area of the Enosburg Falls Hydroelectric facility; and the Trout River from the confluence of Jay and Wade Brooks in Montgomery to when it joins the Missisquoi in East Berkshire.

A locally-appointed Study committee was convened in 2009 to investigate the eligibility and suitability of the inclusion of the upper Missisquoi and Trout Rivers into the National Wild and Scenic River System. The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee (Study Committee) is comprised of representatives appointed by each of the Study area municipalities as well as other stakeholders such as regional planning commissions, state agencies and community groups. The role of the Study Committee is to determine whether the Missisquoi and Trout Rivers are eligible for federal designation, to assess the level of local support for such designation, and to summarize its findings and recommendations in this voluntary Management Plan. The Study Committee received financial and technical support from the National Park Service for the Study process.

Outstandingly Remarkable Values

To be eligible for Wild and Scenic designation, a river must be free-flowing (without dams) and possess at least one Outstandingly Remarkable Value (ORV). An ORV is a unique, rare, or exemplary river-related feature that is significant at a comparative regional or national scale. The Study Committee gathered information about the upper Missisquoi and Trout Rivers and their associated natural, cultural, and recreational resources with assistance from knowledgeable community members, academics from area universities as well as local, state and federal officials.

The Study Committee determined through its investigation that the upper Missisquoi and Trout Rivers possess a number of ORVs in the Scenic and Recreational, Natural Resource, Historic and Cultural, and Water Quality categories. The Study Committee also identified working landscapes (including agriculture and silviculture) as significant, regionally important and often river-dependent resources. Examples of ORVs include swimming holes; paddling opportunities; fishing; geological features such as waterfalls and gorges; rare, threatened and endangered species; and covered bridges. Short descriptions of some of the significant Missisquoi and Trout River ORVs are presented below.

- The Study area rivers are renowned for their numerous deep, picturesque bedrock swimming holes. Some, like the Three Holes swimming area on the Trout River in Montgomery, have been featured in publications such as *Yankee* magazine. All of these Recreational ORVs provide clear, refreshing water in which to cool off after a long drive or hard day of work.

- Scenic ORVs are also abundant in the Study area. One example, Big Falls in Troy, is the largest natural, undammed falls in Vermont; it is also a State park. This geologic feature consists of three separate channels with a total vertical drop of about 40 feet (25 feet being the largest single drop). There is a 225-foot long gorge downstream of the falls with 60-foot high walls. The gorge ends in large pool about 100

feet across with beaches that make for good swimming, and excellent place for a picnic or fall foliage viewing. Geology also contributes to Natural Resource ORVs and the presence of blueschists and serpentinites which support several rare, threatened, and endangered species of plants and animals.

- The Study area also possesses a number of Historic and Cultural ORVs including the greatest concentration of covered bridges in any town in the country. In Montgomery alone, there are six covered bridges still in use today. A seventh, the Hectorville Bridge from Gibou Road, is currently in off-site storage awaiting repair. All were built by the same men, the Jewett brothers, in the 1800s and are listed on the National Register of Historic Places. These historic bridges, along with one in Troy and another in Enosburgh, are popular destinations for sightseers and add to the unique local character of the region.

Existing Protections

For each ORV identified, the Study Committee was tasked with determining the protections existing for these resources. After assessing gaps in protections, the Committee made suggestions for voluntary management recommendations which are included in this Plan. Existing laws, regulations and ordinances at the federal, state and local levels afford a high degree of protection for many of the ORVs found along the upper Missisquoi and Trout Rivers. Some of the more significant federal laws that provide protections for ORVs include the Clean Water Act, Historic Preservation Act, Endangered Species Act, and National Environmental Policy Act. These laws protect water quality, historic and archaeological resources, threatened and endangered species, and the environment, respectively.

At the State level, some of the more significant laws that provide protections for ORVs are the Vermont State Water Quality Standards, Endangered Species Act, and Act 250; they afford protections for water quality, threatened and endangered species, and the environment and community life, respectively. At the local level, town plans and ordinances supplement state and federal laws and regulations and, to varying degrees, address protection of ORVs in each of the municipalities.

The Study Committee also identified some possible threats to the ORVs of the upper Missisquoi and Trout Rivers. Possible threats to Natural Resource ORVs include habitat loss and fragmentation, terrestrial and aquatic invasive species, and increased inputs of non-point source pollution. Potential threats to Historic and Cultural ORVs include erosion of river banks containing archaeological resources, and lack of funding for upkeep/deterioration of covered bridges. Threats to Scenic and Recreational ORVs include lack of official access points, loss of public access due to increased posting, and increased erosion from foot traffic at existing access points. Water quality is threatened by nutrient and sediment inputs, and loss of healthy aquatic habitat.

Management Recommendations

The Management Plan presents a series of recommendations that can be voluntarily implemented by local landowners, municipalities, and state and federal agencies to help protect river-related resources and maintain the quality and way of life valued by so many people. The Study Committee proposes that the upper Missisquoi and Trout Rivers be managed as Partnership Wild and Scenic Rivers if they are designated into the National System. This means that the Study Committee recommends that there be no federal acquisition or management of lands. Instead, administration of the Rivers would be based on this locally-developed river Management Plan implemented by a post-designation, locally appointed Advisory Committee.

To that end, the Study Committee developed a series of recommendations to address potential threats and gaps in protections to ORVs. All of the recommendations in this Plan are voluntary, may be found at the end of

each ORV chapter, and are summarized in an Appendix. It is hoped that they will be embraced by the local communities as a way to implement a shared vision for the future of the upper Missisquoi and Trout Rivers and their contribution to the unique character of the region.

Next Steps

The Study Committee is engaging with the riverfront communities in a dialog about the Plan, its recommendations, and potential Wild and Scenic designation. This dialogue will culminate with 2013 Town Meeting votes in the Study area on the Management Plan and Wild and Scenic designation. The Study Committee will only recommend designation if the Plan and designation are supported by favorable votes. If the communities vote to support Wild and Scenic designation, Congress will be petitioned to enact a bill designating the Missisquoi and Trout Rivers under the National Wild and Scenic River System. The designated reaches will be the approximately 50-mile segment of the upper Missisquoi from its headwaters (confluence of the East and Burgess Branches) in Lowell to Enosburg Falls (excluding the dammed portions and the portion in Canada), and the approximately 20-mile segment of the Trout River from its headwaters to its confluence with the Missisquoi River.

Effects of Designation and Implementing the Plan

If Congress designates the upper Missisquoi and Trout as National Wild and Scenic Rivers, most things will remain the same. For example, existing state and local laws will continue to govern-private lands and activities will not be subject to increased federal control. Land use decisions will continue to be made by local planning and zoning boards, not federal agencies. The federal government will not acquire lands to implement the designation. Licensed, pre-existing hydroelectric facilities can continue to operate; other existing dams can be retrofitted for non-hydroelectric power purposes. Hunting and fishing laws and regulations will be unaffected, and rules governing agricultural practices will not change.

Designation will result in the establishment of an Advisory Committee comprised of local representatives to guide the administration of the designation and implementation of the locally-developed management Plan. It will also result in an appropriation of federal funds (subject to Congressional approval) to support implementation of the Management Plan. Designation would also give the local municipalities a voice, through the Advisory Committee, in protecting ORVs from any harmful effects of new *federally* funded or permitted construction or development water resource projects affecting the designated portions of the rivers.

Summary

This voluntary Management Plan is meant to give recommendations about how to preserve, protect and enhance locally identified Outstandingly Remarkable Values which make the upper Missisquoi and Trout Rivers eligible for Wild and Scenic designation. Funding is often more easily leveraged using the 'clout' of designation; however, if annual federal funds are insufficient, towns have no obligation to expend their own funds to carry out projects. If designation occurs, existing state and local laws will continue to govern - private lands and activities will not be subject to increased federal control. Hunting and fishing laws will be unaffected, and rules governing agricultural practices will not change. Designation would give local municipalities a voice in protecting river resources from any harmful effects of new, *federally* funded or permitted, construction or development, water resources project affecting the Rivers. Though no new federally supported dams may be built on the upper Missisquoi or Trout Rivers if designated, licensed, pre-existing hydroelectric facilities may continue to operate, and other existing dams can be retrofitted for non-hydroelectric purposes. Partnership Wild and Scenic River projects are carried out through outreach and education to engage the public, including landowners, recreational users, towns, local organizations, and the State and keep partners active in preserving and enhancing valued resources. Comments and suggestions on this Management Plan may be directed to the Wild and Scenic Study Committee.

Chapter I. Management Plan – Development, Philosophy and Implementation

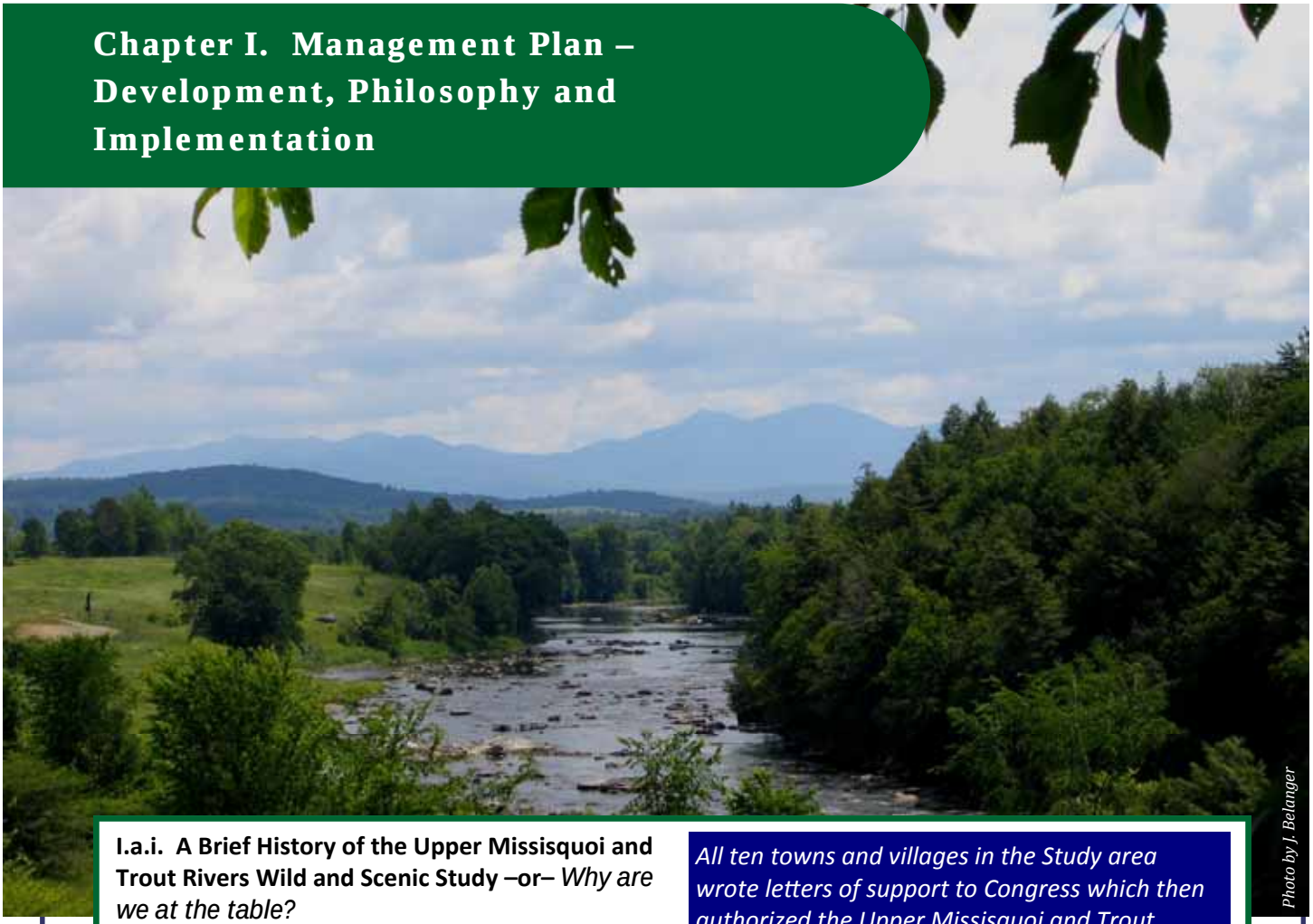


Photo by J. Belanger

I.a.i. A Brief History of the Upper Missisquoi and Trout Rivers Wild and Scenic Study –or– *Why are we at the table?*

In 2004, Missisquoi River Basin Association (MRBA) Chair John Little and Treasurer Wendy Scott attended a River Rally conference (a series of nationwide workshops sponsored by the River Network) and learned about the Wild & Scenic Rivers program. Their interest was piqued especially when they learned that Vermont has no Wild & Scenic Rivers, and they felt their long-time love, the Missisquoi River, should be considered for designation.

There began a 5-year effort, primarily on the part of MRBA Board members John Little, Anne McKay and Chris O'Shea, of working with selectboards, community members, and Congressional Representatives to garner support for a Study to determine the eligibility of the Missisquoi and Trout Rivers for inclusion in the Wild & Scenic Rivers program. The Study area covers the Missisquoi River from Enosburg Falls upstream (excluding the Canadian portion) to its headwaters in Lowell (~50 river miles), and the Trout River, a major tributary predominantly in Montgomery, joins the Missisquoi in East Berkshire (~11 river miles). The sections being recommended for designation include: the Missisquoi River from the confluence of Burgess Branch and the East Branch of the Missisquoi in Lowell to the Canadian border in North Troy (excluding the property and project area of the Troy and the project area of the North Troy Hydroelectric Facilities), from the Canadian border in Richford to the beginning of the project area of the Enosburg Falls Hydroelectric facility; and the Trout River from the confluence of Jay and Wade Brooks in Montgomery to when it joins the Missisquoi in East Berkshire. All ten towns and villages (Berkshire, Town of Enosburgh, Village of Enosburg Falls, Jay, Lowell, Montgomery, Village of North Troy, Richford, Westfield, and the Town

All ten towns and villages in the Study area wrote letters of support to Congress which then authorized the Upper Missisquoi and Trout Rivers Wild and Scenic Study.

of Troy) in the Study area wrote a letter to Congress showing support for the Wild and Scenic Study.

With the support of Vermont's Representative Peter Welch and Senators Patrick Leahy and Bernard Sanders, President Barack Obama signed H.R. 146, the Omnibus Public Land Management Act of 2009, into Public Law 111-11 in March 2009 authorizing funding for a study to identify the "outstandingly remarkable values" of the Missisquoi and Trout Rivers, considering their ecological attributes as well as recreational uses, scenery, geology, and cultural features. The Study took about three years. Upon completion of the study, the decision to seek designation or not was made locally through vote at town meeting (sought in March 2013); if support was demonstrated and designation sought, Wild & Scenic designation would be granted by an Act of Congress.

A multi-year grant from the National Park Service funded the Upper Missisquoi and Trout Wild and Scenic Study. A Study Committee comprised of local representatives appointed by selectboards as well as partnership organizations was formed and began to meet regularly in October 2009. The goal of the Study Committee was to:

≈ Determine whether the Missisquoi and Trout Rivers were eligible for designation

≈ Determine whether there is local support for designation

≈ Summarize their findings in a voluntary management plan which may be utilized regardless of designation.

I.a.ii. Short and Long-term Goals of the Study Committee

A management plan must be written by the Study Committee for each river under study for inclusion in the Wild and Scenic River system. Section 10(a) of the Wild and Scenic Rivers Act states the intention of management of the rivers as the following:

"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 [ORVs] *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 aesthetic, scenic, historic, archaeologic, and scientific features. Management plans for any such component may establish varying degrees of intensity for its protection and development, based on the special attributes of the area."*

The Study Committee set for itself the short-term goal of writing this Management Plan with the maximum amount of local input. The information gathered for the Management Plan was discussed at monthly Committee meetings which were publicized and open to all. Much of the information discussed at meetings was made available on the Committee's website (www.vtwsr.org) including meeting minutes. The Management Plan, written by the Study Committee, was reviewed internally, including a review by partners at the local and state level with extensive knowledge of the resources discussed. This Management Plan was then made available to the public for a review period in the fall of 2012 after which comments were incorporated into the Plan. Finally, the final Plan was made available on the website (www.vtwsr.org) prior to Town Meetings, and will also be available in hard copy at various locations in the Study area including Town Clerks' offices.

The long-term goal of the Study Committee is to encourage, through education and outreach, planning at the local, regional and state levels which utilize the information and voluntary recommendations outlined in the Management Plan regardless of the outcome of designation.

I.a.iii. Management Plan Development

The Management Plan was developed over the Study period which officially began with the formation of

the Study Committee and the hiring of the Study Coordinator in late 2009. First the Committee, along with input from local, state, and federal experts, identified whether the rivers were eligible for designation. To be eligible, a river must be free-flowing, and must contain at least one Outstandingly Remarkable Value (ORV– please see the ORV chapters of this Management Plan for more information). Both the upper Missisquoi and Trout Rivers were found to have ORVS and thus be eligible for designation. ORVs were identified in each of the following categories (though some resources belong in more than one category): Scenic and Recreational, Natural Resource, Water Quality and Historic and Cultural. Each ORV was described by answering the following questions about the resources:

≈ what are the resources and what makes them ORVs

≈ what are the protection goals for these resources

≈ what are the existing protections for these resources (local, state and federal protections)

≈ what are potential threats to these resources

≈ what are the gaps in protections based on these threats

≈ what are the opportunities for action or management recommendations identified for each resource

The opportunities for action and management recommendations identified by the Study Committee are completely voluntary. They suggest ways that gaps may be filled to better protect the outstanding resources of the Missisquoi and Trout Rivers as identified by the local community with the help of the Study Committee. The laws which currently govern water resources and private land management still govern the protection of these resources even after Wild and Scenic designation, should it occur. This Management Plan is a roadmap for the post-designation Advisory Committee, area residents, and local, regional and state planners to follow, if they wish, to protect the Outstandingly Remarkable Values of the Missisquoi and Trout Rivers.

Figure 2. Discussing Outstandingly Remarkable Values (ORVs) at a Study Committee meeting. *Photo by Shana Stewart Deeds.*

I.a.iv. Study Committee Outreach and Education/ Summary of Study Committee Activities

The upper Missisquoi and Trout Rivers Wild and Scenic Study Committee has posted a yearly summary of accomplishments on the webpage (www.vtwsr.org) listing the types of education and outreach activities completed by the Committee. The following is an abbreviated list of projects completed by the Study Committee:

≈ Monthly Study Committee meetings advertised and open to the public

≈ Rotating displays with Wild and Scenic information in town clerk offices, town libraries and schools, farmer's markets, local festivals and fairs

≈ Information was distributed at town meetings and through landowner mailings

≈ Summer newsletters were created and distributed at events, local venues, and through river-front landowner mailings

≈ Newspaper articles and ads presented information on the Wild and Scenic Study

≈ A traveling Power Point presentation was developed and presented at meetings of various local and State organizations

≈ The Study Committee held paddles on all easily navigable sections of the upper Missisquoi

≈ Informational potlucks were held

≈ A film series occurred in each county

≈ Online outreach occurred on Facebook, the Study website and blog, and through SurveyMonkey

≈ Committee meetings were taped and played on public access television

≈ Resource review at meetings included inviting knowledgeable speakers such as:

- Staci Pomeroy, from the ANR's River Program, set up the river demonstration known as a flume, and Dori Barton from Arrowwood Environmental discussed the geomorphology of the Study rivers
- Walter Opuszynski from the Northern Forest Canoe Trail discussed the trail and specifically the section along the Missisquoi River
- John Little, Keith Sampietro and Ken Secor presented photos and details of paddling adventures
- Mike Manahan and Parma Jewett shared their fishing experience
- Janice Geraw from the Enosburgh Historical Society, Sam Thurston from the Lowell Historical Society, and Scott Perry from the Montgomery Historical Society discussed local history at Committee meetings
- Barry Doolan and Stephen Wright from UVM discussed local bedrock and glacial geology
- Rich Langdon from VT ANR's Department of Environmental Conservation - Watershed Management Division and Bernie Peintka from VT's Fish and Wildlife Department discussed Vermont's fish populations
- Ben Gabos, Laurie DiPietro and Sylvia Jensen from the Agency of Agriculture discussed local water quality protections and projects on farms
- Bobby Farlice-Rubio from the Fairbanks Museum discussed Abenaki history along the rivers
- NPS representatives discussed designation and its effects on hydropower at a Committee meeting in Lowell with many local community members present

≈ Leading up to Town Meetings numerous newspaper articles appeared in local papers, WCAX TV aired an interview about the designation, and VPR's Vermont Edition interviewed the Study Coordinator

Figure 3. Vermont geology expert Barry Doolan discusses the geology of the upper Missisquoi and Trout Rivers with the Study Committee at a monthly meeting. *Photo by Shana Stewart Deeds.*

"Missisquoi"

~North Troy School

As the Missisquoi banks overflow,
Jay Peak will watch o'er the falls below,
So stands our High School,
Always the same,
We will stand by you and win your fame.
North Troy we love you, we'll do our best
Never to harm you, we'll stand the test.
As the Missisquoi banks overflow,
We will stand by you, North Troy you know.

Figure 4. Richford from above. *Photo by Art Bell.*

Chapter II. Upper Missisquoi and Trout Rivers Study Area

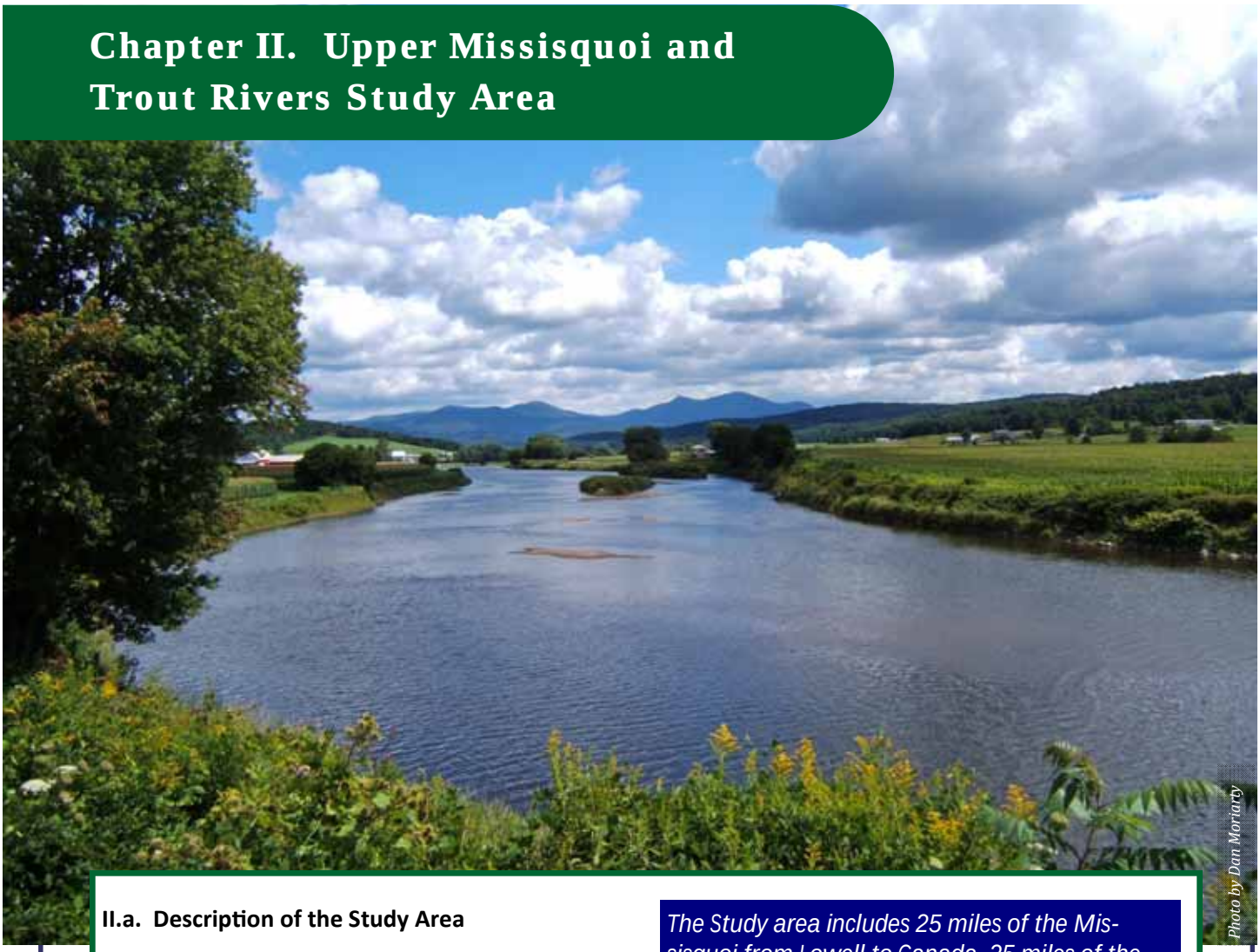


Photo by Dan Moriarty

II.a. Description of the Study Area

The Study area sections of the Upper Missisquoi and Trout Rivers flow through the municipalities, mixed forests and working landscapes in picturesque northern Vermont. The Study rivers border the northern Green Mountains, providing countless dramatic views of some of Vermont's highest peaks. The Study area constitutes 25 river miles of the Missisquoi River from Lowell to North Troy, VT and 25 miles from Richford to Enosburg Falls, VT (excluding hydro project boundaries). The Portion of the Trout River under study is mostly in Montgomery, VT, and stretches 11 river miles upstream from its confluence with the Missisquoi in East Berkshire, VT. The land use in the entire Missisquoi River watershed is 66% forested, 25% agricultural, and 6% urban. The Trout River watershed is 84% forested, 7% agricultural and 3% urbanized (VCGI Land-use Layers).

The Study area includes 25 miles of the Missisquoi from Lowell to Canada, 25 miles of the Missisquoi from Richford to Enosburg Falls, and 11 miles of the Trout River from Montgomery to East Berkshire.

The Study area begins in Lowell, VT, on the northern side of Hazen's Notch Road. The Missisquoi River flows north from Lowell through the towns of Westfield, Troy and North Troy, VT.

This section of the river meanders through agricultural fields and forests, past rare Serpentine bedrock outcroppings and silver maple floodplain forests. There are several riffles and water features in this section, most notably Big Falls in North Troy. Big Falls is the largest undammed waterfall in Vermont and is part of Big Falls State Park. Once the river flows over Big Falls and through its gorge, the river passes into Canada and eventually reenters the United States in Richford, VT. There

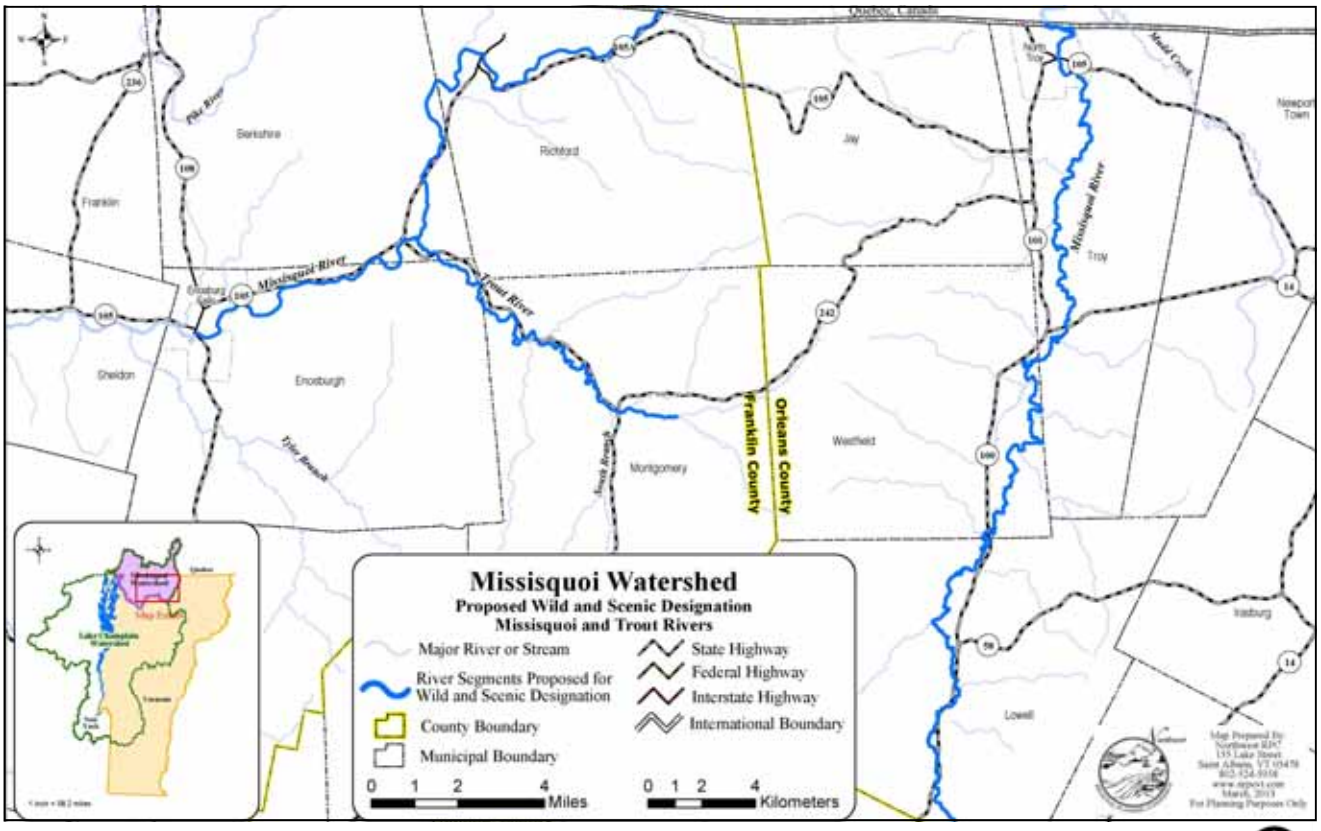


Figure 5. Map of the Study area showing river segments that are being considered for Wild and Scenic designation.

are many points of access along the river in stretch for recreation including boating, fishing and swimming.

The Study area of the Missisquoi also includes, after reentry into the U.S. from Canada, the section from Richford to Enosburg Falls, VT. The river is larger in this section, and flows largely through a working agricultural landscape and through two downtown historic districts in Richford and Enosburg Falls. The open landscape along this section allows for striking views of the Green Mountains as well as local farmlands. This section of the river is also part of the Northern Forest Canoe Trail and has five official Trail access points.

The Trout River meets the Missisquoi River in East Berkshire, VT, though the Study section of the Trout River flows mainly through the Town of Montgomery. Agriculture is the dominant land use along the main stem of the Trout River, but the upper reaches above Montgomery Center are mainly forested. The Trout River in Montgomery is renowned for its high density of waterfalls, swimming holes, and especially covered bridges; Montgomery has the highest number of covered bridges of any town in the country.[1]

The Missisquoi River and Trout Rivers and their tributaries provide countless resources to the communities through which they run including cultural, scenic, recreational, and water resource values. For example, these rivers support a diverse fishery resource, with a mix of high elevation cold-water streams as well as slower-flowing warm water reaches. The varied fish habitat and relative ease of

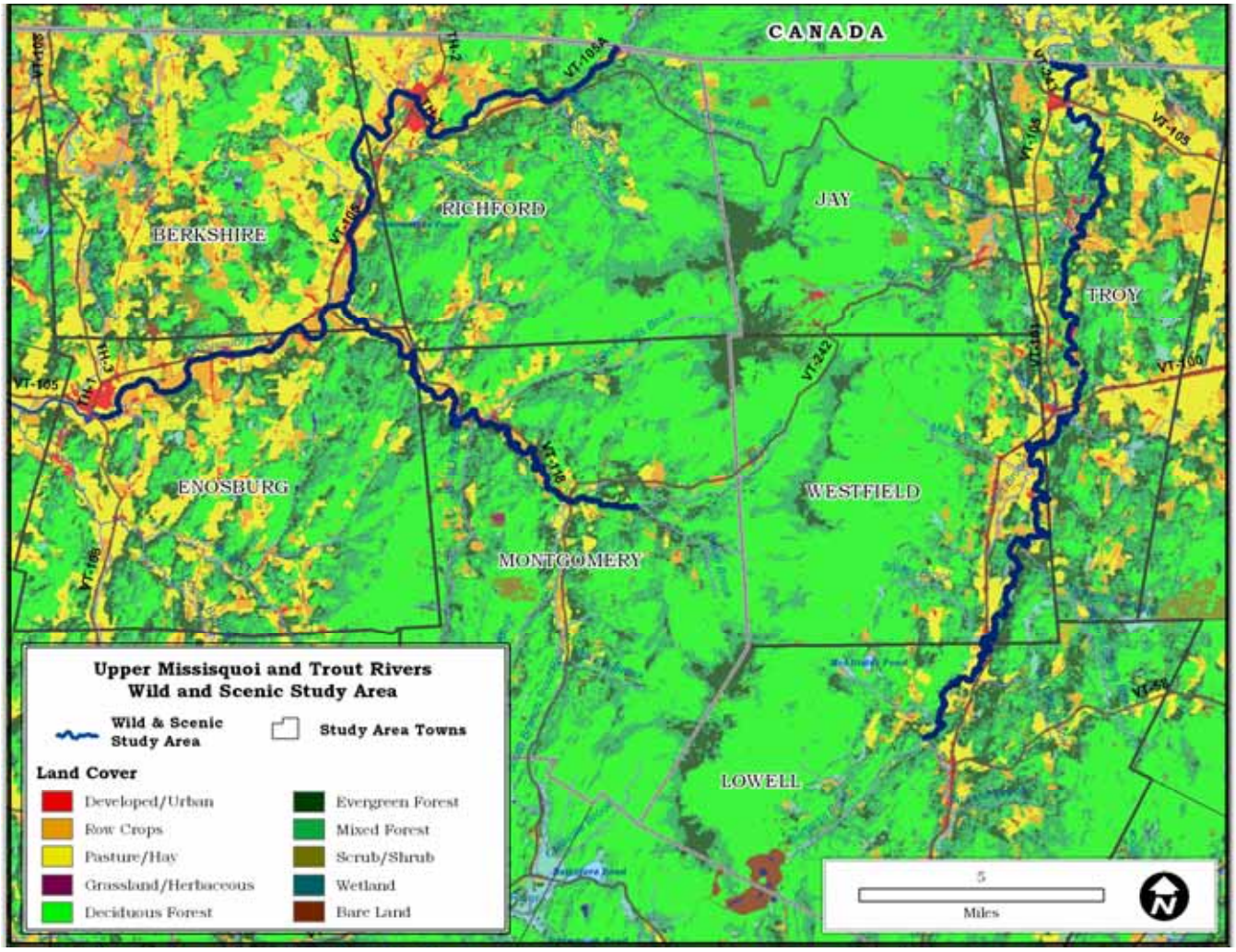


Figure 6. Land use in the Study area. 2006 data, available from NOAA: www.csc.noaa.gov/crs/lca/northeast.html

access to many sections of rivers and streams create significant opportunities for recreational fishing in the Missisquoi watershed. The river and its many tributaries are also popular for boating, swimming and wildlife viewing. These rivers also provide an important water resource for human use including drinking water and agricultural needs.

Many portions of the Study rivers and their tributaries have been noted as exhibiting high water quality by the Vermont Agency of Natural Resources (this is discussed further in the Water Quality ORV Chapter of this Plan). All sections of the Study rivers are popular for paddling, fishing, swimming, and viewing wildlife and cultural features such as covered bridges. The rivers are, historically and currently, a vital part of each town and village they flow through.

II.a.i. Relation to the Missisquoi River Basin; Linkage to Lake Champlain and the Missisquoi National Wildlife Refuge

The Missisquoi River is the primary tributary of Missisquoi Bay in Lake Champlain. Missisquoi Bay contains the Missisquoi National Wildlife Refuge, a 6,729 acre area on the Missisquoi River delta that provides important wetland and forest habitat for waterfowl, migrating songbirds, many species of mammals and other wildlife. The Refuge provides critical habitat for a large number of Vermont bird Species of Greatest Conservation Need (see the Bird

Appendix 7 of this Plan). Additionally, the spiny softshell turtle – a Vermont-threatened species – uses the Refuge waters to bask and feed from April through September. Other species of conservation concern in the lower portion of the river, below the dam in Highgate, VT, include five species of endangered mussels and several threatened or endangered fish, including the lake sturgeon.[2] Although this lower section of the Missisquoi is below the Study area, the quality of water passing through tributaries and the mid and upper reaches of the Missisquoi River is critical for maintaining habitat supportive of these species downstream not to mention human use. The positive actions taken in the Study area have a positive impact on water quality, habitat, and human use of the river all the way to the Missisquoi Bay and into Lake Champlain.

II.b. Missisquoi Basin Watershed Water Quality Management Plan

Watershed management is under the prevue of the Vermont Agency of Natural Resources, Department of Environmental Conservation's Watershed Management Division. The Upper Missisquoi and Trout Rivers Wild and Scenic Study has a partnership with the Watershed Management Division; representatives have come to meetings to participate and inform the Committee about the most up to date information on the watershed and water quality issues.

As this Management Plan is being prepared, the Watershed Management Division is nearing completion of the *Missisquoi Basin Watershed Water Quality Management Plan*, which describes the current state of the Missisquoi River Basin, addresses water quality issues in the watershed and outlines plans to improving both water quality and aquatic habitat. Their Plan presents the recommendations of a cross section of stakeholders, including residents of the basin, the Vermont Agency of Natural Resources, and professionals from other State and federal agencies meant to guide efforts in the Basin over the next five years. It is not the Study Committee's intention to duplicate their management plan, and as such we reference their Plan, but do not include here all of the information contained within it. Please see their draft and final Plan available on their website (http://www.anr.state.vt.us/dec/waterq/planning/htm/pl_missisquoi.htm).

Their Plan discusses the greatest impairments and threats to water quality in the Basin, which include sedimentation, siltation, turbidity, habitat alterations, nutrients, thermal modifications, flow alterations and metals, as well as physical instability and river corridor encroachment. The Water Quality Management Plan seeks to illustrate strategies, specific actions, for improvement of the water quality and aquatic habitat in the Missisquoi Basin. The Upper Missisquoi and Trout Rivers Study Committee generally supports the content and recommendations of the Missisquoi Basin Water Quality Management Plan. There are a large number of organizations currently working in the Missisquoi Watershed to reduce issues in the basin. Please see the Missisquoi Basin Watershed Water Quality Management Plan and the Water Quality ORV and Protections sections of this Management Plan for a discussion of these ongoing organizations and projects.

II.c. Recommended Boundaries of Section Recommended for Designation

The sections being recommended for designation include: the Missisquoi River from the confluence of Burgess Branch and the East Branch of the Missisquoi in Lowell to the Canadian border in North Troy (excluding the property and project area of the Troy and the project boundary of the North Troy Hydroelectric Facilities), from the Canadian border in Richford to the beginning of the project area of the Enosburg Falls Hydroelectric facility; and the Trout River from the confluence of Jay and Wade Brooks in Montgomery to when it joins the Missisquoi in East Berkshire.

There is no distinct lateral boundary or corridor recommended within this Management Plan or for the Partnership Wild and Scenic River designation of the upper Missisquoi and Trout Rivers. Section 3 of the

Wild and Scenic Act envisions that lateral "boundaries" be established for all designated Wild and Scenic Rivers as a part of the management planning process or as recommended through a study process. This definition of a corridor is typically used for federal land management and acquisition, which is not desired by the Study Committee. Since the Study area contains little or no federal lands, and there are no plans for federal acquisition, the Study Committee has determined that distinct lateral boundaries are not necessary as they serve little purpose and often lead to confusion.

Endnotes

[1] http://www.montgomeryvt.us/pdf/mhsbridgepam.pdf

[2] Agency of Natural Resources, Draft Basin 6 [Missisquoi Basin Watershed] Water Quality Management Plan, dated November, 2012.

Figure 7. Missisquoi River near the Enosburgh Dairy Center and the Boston Post Road Bridge. *Photo taken by Ken Secor.*

Chapter III. Background on Wild and Scenic Rivers

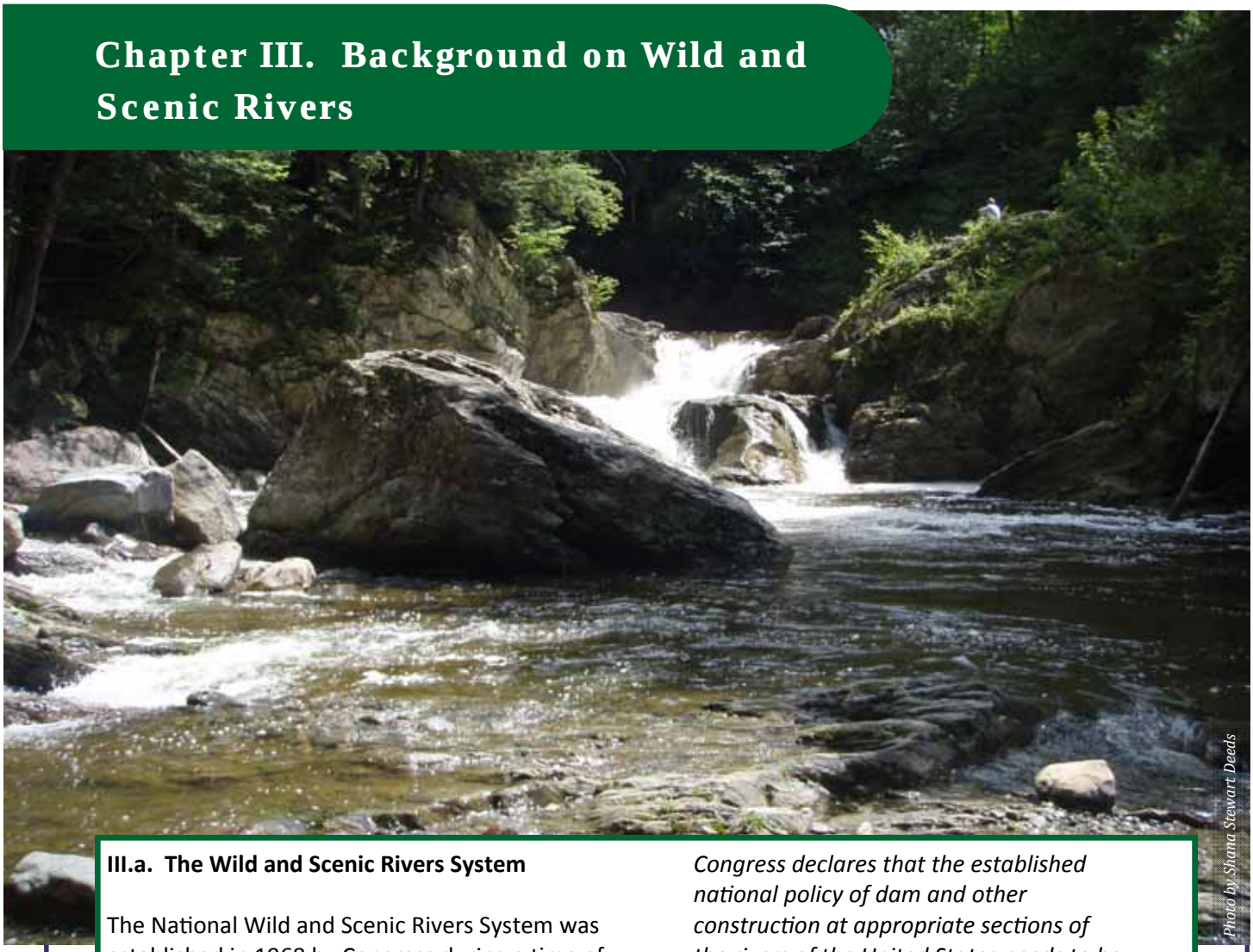


Photo by Shana Stewart Deeds

III.a. The Wild and Scenic Rivers System

The National Wild and Scenic Rivers System was established in 1968 by Congress during a time of widespread dam building and hydroelectric development. The System is meant to protect free-flowing rivers with outstandingly remarkable values from any harmful effects of new, federally funded or permitted projects. The Congressional declaration of policy in the Wild and Scenic Rivers Act (16 U.S.C. 1271-1287) 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. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.*

To be eligible as a Wild and Scenic River the river must be free-flowing and have at least one Outstandingly Remarkable Value (ORV) – these values are discussed in depth in Chapter IV of this Management Plan. Free-flowing river segments are those that do not have an impoundment even if impoundments occur upstream or downstream. ORVs are those locally recognized values which are river-related and unique, rare, or exemplary features that are significant at a comparative regional or national scale. Upper Missisquoi and Trout River ORVs were found to be in the Scenic

and Recreational, Natural Resource, Water Quality and Historic and Cultural categories.

III.a.i. Section 7 of the Wild and Scenic Rivers Act

The intention of Section 7 of the Wild and Scenic Act is to protect the designated rivers from new federal projects which would adversely affect the free-flowing condition and outstandingly remarkable values for which rivers are designated. This Section requires the evaluation of partially or fully federally funded or permitted construction and development water resource projects within the designated area. This Section prevents licensing or exemption by FERC (the Federal Energy Regulatory Commission) of new dams or hydropower facilities on or directly affecting the designated area; prevents federal projects which have a direct and adverse effect on the free-flowing nature, outstandingly remarkable values, or water quality of the designated area, and limits federal projects which would invade the designated area or unreasonably diminish the free-flowing nature, outstandingly remarkable values, or water quality of the designated area. Though this Section is the regulatory arm of the Act, it applies only to specific federal projects and does not impact local zoning or the land use of private landowners as this remains governed by local and state laws regardless of designation. (Please see section c below for more information on the Section 7 review process).

Figure 8. There are eight designated rivers in New England: Allagash (Maine); Lamprey (New Hampshire); Wildcat Brook (New Hampshire); Concord, Sudbury, and Assabet Rivers (Massachusetts); Taunton (Massachusetts); Westfield (Massachusetts); Eightmile (Connecticut); Farmington (Connecticut). The Lower Farmington and Salmon Brook Rivers are under study in Connecticut.

III.a.ii. Partnership Wild and Scenic Rivers

Partnership Wild and Scenic Rivers, once designated, rely on pre-existing local and state regulations and management which continue even if designation occurs.

Over 200 rivers nationwide are designated federally as Wild and Scenic; however, fewer than 10 rivers in New England and none in Vermont have been designated. This is partially due to the unique challenges faced by those seeking designation of rivers that predominantly flow through non-federal lands with multiple landowners (called Partnership Rivers). These Partnership Wild and Scenic Rivers are a subset of the national Wild and Scenic System and flow through land predominantly held in private ownership or lands owned by state and local governments. This ownership is maintained regardless of designation. Designation of a Partnership River begins with a community-based process which includes the formation of a Study Committee made up of local appointees and partnership organizations which studies designation. The Upper Missisquoi and Trout Rivers Wild and Scenic Study is a partnership of organizations and official appointees from the Study towns (please see the official list on page iii) who have volunteered their time for three years represent their communities. The Upper Missisquoi and Trout Rivers

Wild and Scenic Study Committee recognizes the importance of privately-owned rivers with established and continuing local control of river management. Their goal is to bring community members together in identifying, protecting, managing and potentially enhancing local river resources. Partnership River Studies such as the VT Study:

- ≈ do not rely on federal land ownership or management
- ≈ rely on local and state regulations and management as before designation
- ≈ are facilitated by a locally appointed Study Committee which helps implement designation of the rivers along with assistance from state, town, and federal partners (should designation occur a Post-designation Advisory Committee would be established to do the same)
- ≈ requires no establishment of a national park or superintendent or law enforcement agent from the National Park Service
- ≈ does not require purchase or transfer of lands to the NPS
- ≈ succeeds through voluntary education, outreach, and management efforts and local support

III.b. General Upper Missisquoi and Trout Rivers Wild and Scenic Study Process

A Wild and Scenic study occurs to determine eligibility and support for inclusion of rivers into the National Wild and Scenic Rivers System. The study process for Partnership Rivers typically is initiated when authorized by Congress, in the form of an Act, and signed into law by the President. In 2009 the Vermont Congressional delegation introduced a bill to authorize the Study of the Upper Missisquoi and Trout Rivers for inclusion into the National Wild and Scenic Rivers System. The Study area covers the Missisquoi River from Enosburg Falls upstream (excluding the Canadian portion) to its headwaters in Lowell (~50 river miles), and the Trout River, a major tributary predominantly in Montgomery, joins the Missisquoi in East Berkshire (~20 river miles). All ten towns and villages (Berkshire, Town of Enosburgh, Village of Enosburg Falls, Jay, Lowell, Montgomery, Village of North Troy, Richford, Westfield, and the Town of Troy) in the Study area wrote a letter to Congress showing support for the Wild and Scenic Study.

On March 30, 2009, President Obama approved H.R. 146, the Omnibus Public Land Management Act of 2009, as Public Law 111-11. Title V, Subtitle B, Section 5101 of the act amends the Wild and Scenic Rivers Act to authorize a study of three segments of the Missisquoi and Trout Rivers in Vermont. The resulting Study was the culmination of a 5-year effort, primarily on the part of the Missisquoi River Basin Association (MRBA). In part, this authorized the formation of a Study Committee to identify, research and document the resources of the upper Missisquoi and Trout Rivers, identify those which fall under the criteria of Outstandingly Remarkable Values (ORVs), and determine whether the rivers are eligible and there is local support for federal designation of these rivers. This Study was conducted under the principles of Partnership Wild and Scenic Rivers by the locally-appointed Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee and other local and state stakeholders. The membership of the Study Committee is listed on page __ of this Plan.

The Study Committee began to meet regularly in October 2009. The adopted mission of the Study Committee is as follows:

> The Vermont [Upper Missisquoi and Trout Rivers] Wild & Scenic Rivers Study Committee is formed of local appointees and partner organizations to evaluate Wild and Scenic Designation along the upper Missisquoi and Trout Rivers.
>
> The group's mission is to facilitate the transfer of information between the ten communities

the rivers run through, Berkshire, Town of Enosburgh, Village of Enosburg Falls, Jay, Lowell, Montgomery, Village of North Troy, Richford, Westfield, and the Town of Troy, and evaluate the potential benefits of the Wild & Scenic designation. At the end of the Study in 2013, we will provide an accurate assessment as to whether the rivers fit designation criteria and whether designation is supported, and make recommendations of voluntary strategies for protection of the rivers' resources. Study Committee meetings are open to the public and driven by consensus.

The Study Committee rotated its regular meetings, on the third Thursday of each month, among the ten towns and villages in the Study area. All meetings were advertised, and open to the public. A decision making policy for the Study Committee was adopted in March 2010, revised in September 2012, and adopted in October 2012 which confirms that the Study Committee meetings are run by consensus, and should a vote occur, each municipality (Berkshire, Town of Enosburgh, Village of Enosburg Falls, Jay, Lowell, Montgomery, Village of North Troy, Richford, Westfield, and the Town of Troy) will get one vote. The majority of votes by the officially-appointed representatives will carry the decision.

On October 18, 2012, the Study Committee voting members present unanimously voted in favor of recommending the designation of the Missisquoi and Trout Rivers into the National Wild and Scenic Rivers System for the reaches located within the Study area towns. The Committee believes that designation as a Partnership Wild and Scenic River, based on implementation of the Draft Plan through a locally-based committee (like the Study Committee), can be an important contributor to our rivers and our communities. This Partnership approach has proven successful in our neighboring New England states and we have seen no evidence of an unwanted or heavy federal presence. The Study Committee's recommendation in favor of designation and supporting this Management Plan was presented in an article at town meeting in nine Study municipalities in March 2013 following a public comment period, in the fall of 2012, on this Management Plan. This article is as follows:

> *To see if the voters of the Town of **X** will petition the Congress of the United States of America that the upper Missisquoi and Trout Rivers be designated as Wild and Scenic Rivers with the understanding that such designation would be based on the locally-developed rivers Management Plan and would not involve federal acquisition or management of lands.*

Favorable votes demonstrated local support for designation prior to further action by Congress with the intention that designation would not bring additional federal acquisition or management of lands. Following town meetings, the Study Committee and the National Park Service will draft a report to Congress that documents the eligibility and suitability of the designation of the upper Missisquoi and Trout Rivers as part of the Wild and Scenic Rivers System. Designation will occur in the event that Congress enacts a bill amending the Wild and Scenic Rivers Act to add the upper Missisquoi and Trout Rivers into the System which is then signed into law by the President.

III.c. Section 7 Review Process During the Study

As stated above, under Section 7 of the Wild and Scenic Rivers Act only those projects with full or partial federal funding or permitting, construction and development and water resource related projects are reviewed by the National Park Service (NPS). The protections of Section 7 of the Wild and Scenic Act apply to Study Rivers on an interim basis (see Section 7b of the Wild and Scenic Act and more information on the www.rivers.gov website). Section 7 of the Wild and Scenic Rivers Act charges the NPS with the responsibility of reviewing these federal projects on Wild and Scenic Rivers to determine if they would adversely affect the free-flowing condition, water quality, or Outstandingly Remarkable Values (ORVs) which make the rivers eligible for designation. During the Study period, NPS consults with the Study Committee as part of the review process. Similarly,

the post-designation Advisory Committee will be involved in these reviews as well. The Study Committee recognized the importance of local input into the consideration of projects under federal Section 7 review, and adopted (in February 2012) the following policy for any projects which require review during the Study process:

- The National Park Service is mandated to formally review projects which fall under Section 7 Review for direct, adverse impacts on the river (projects must be all of the following: fully or partially federally funded, construction/ development, and directly related to the river) during the Study period.

- If the NPS is reviewing a project, it will be brought to the attention of the Study Committee at the next monthly Study Committee meeting. At that meeting, NPS staff will discuss the project under review and solicit opinions of the Study Committee; the Study Committee will decide whether not they wish to formally review the project themselves.

- NPS staff will circulate a draft of its comments to the Officers and Study Coordinator to solicit input. Time permitting, the Study Committee may choose to have additional discussion/ action during the next monthly Study Committee meeting. After the NPS staff write their finalized, official comments they will be circulated to the Study Committee. At the next monthly Study Committee meeting the Committee will decide to 1) support the NPS letter or 2) write its own additional comments/ letter.

- All official comment letters will be posted on our website. To date, the following projects have been reviewed by the NPS:

  - The Chase Hydroelectric Project, Troy, VT (Official letters from NPS and Study Committee sought to prevent delay of their FERC permitting process due to the Wild and Scenic Study)

  - The Kingdom Community Wind Project, Lowell, VT (Official letters from the NPS sought to support efforts to maintain water quality of the Missisquoi and its tributaries)

  Official comment letters from the NPS may be found on our website's resources page (www.vtwsr.org/resources.htm).

Should designation occur, the post-designation Advisory Committee will likely adopt a similar policy for how it will review and present its comments for projects which fall under Section 7 review.

III.d. Designation

III.d.i. Benefits of Wild and Scenic Designation

Wild and Scenic designation brings with it many benefits to the surrounding area. The Study Committee recommends that if designation occurs an immediate study of the current economic condition should be completed. This study will provide a baseline against which future economic conditions may be compared, and allow for monitoring of the impacts of designation including increased federal funding, business or tourism in the area, competitiveness in grant applications, etc.

Regardless of designation, this Management Plan is available for local, state, and regional use for management of the upper Missisquoi and Trout Rivers.

Should designation occur, a local Advisory Committee will be formed, and representatives from communities in the designated area will be selected by the town's Selectboards (in much the same way that the Study Committee was formed). The Study Committee recommends that Advisory Committee members are appointed, two from each municipality represented in the designated area, with a tenure of 3 years (which is similar to the tenure of other committee appointees in the area), and that appointments are staggered so that the Committee is never left with two new members from any given municipality in any given year. (Please see the Taunton River Stewardship

Council Organizational Structure in Appendix 8 for an example of the bylaws of a post-designation Advisory Committee.)

National Park Service funding and staff support are available to help the post-designation Advisory Committee work toward the protection and management of the Outstandingly Remarkable Values for which the rivers were designated. Any actions of the Advisory Committee are voluntary, and would be conducted with the participation of willing landowners, municipalities and local partner organizations. Designation typically provides opportunities for education, outreach and protection of the locally valued river resources which define the character of local communities.

National recognition and prestige comes with designation. There are only a few rivers in the country that are designated as Wild and Scenic (< 0.25% of U.S. river miles). Some Wild and Scenic River towns choose to capitalize on this national recognition in the hope of increasing tourism and economic activity. Others choose to maintain a low profile with the goal of preserving current conditions and lifestyles. Either way, post-designation Advisory Committees are able

Would you like to see the quality of the Missisquoi and Trout Rivers maintained or improved? This is a primary goal of this Management Plan. To that end, here are some of the potential benefits of designation:

- *A post-designation Advisory Committee, akin to the current Study Committee, would be established to oversee designation and the funds which accompany it. This Committee would be made up of local, Selectboard appointed representatives and partnership organizations*
- *National Park Service staff provide technical assistance to the Wild and Scenic Committees and local communities*
- *Annual funds are typically provided for the Partnership Wild and Scenic Rivers. These funds could be used to help the towns with a variety of activities that promote river values (such as maintenance projects which control stream erosion or upgrade culverts and improve aquatic organism passage to protect the roadway along with river values and quality)*
- *Designation would protect the upper Missisquoi and Trout Rivers from federal projects which could jeopardize the ORVs including new dams, hydroelectric projects or those falling under Section 7 Review (see Section c above)*
- *The local communities have input into the Section 7 review process through the Wild and Scenic Committee*
- *Designated rivers can have increased tourism and business opportunities if communities choose to use designation in marketing (http://www.youtube.com/watch?v=RgpXAcHZusw is an example of a video produced by a Study Committee in CT on designation benefits to business)*
- *Studies have shown that community members support designation and that inclusion in the Wild and Scenic Rivers system is valued. This community support may help the area be more competitive in grant applications*
- *Increased access to the river for recreational purposes via existing public lands or through private property with willing landowners is recommended in this Management Plan with the goal of reducing impacts (such as erosion, litter, or liability)*
- *The non-regulatory Management Plan is a resource for the communities regardless of designation and may help guide planning at the local, regional or state level*
- *The post-designation Advisory Committee would work to complete the recommendations in the Management Plan including education and outreach efforts in the designated area*

Figure 9. The Missisquoi River in Winter. *Photo by Ken Secor.*

to help meet local goals by producing recreational and educational guides, such as boater trail and recreation maps, assisting local citizens in getting to know and be good stewards of their river, or supporting tourism to boost the economies of the local communities.
As stated above in the Section 7 information, designation prevents federally funded or permitted projects to move forward if they are determined to have an adverse impact on the ORVs. Designated Wild and Scenic Rivers are protected by the Wild and Scenic Rivers Act from federally permitted or funded water resource projects that would have a direct and adverse impact on the ORVs that made the rivers eligible for designation. This review gives greater protection to our locally-valued waters from adverse federal projects. Such federal projects are often important and necessary so are rarely stopped; rather NPS review under Section 7, with input from the local Wild and Scenic Committee, generally results in no change or minor modifications to the project to avoid adverse impacts on ORVs and enable the proposed action to proceed with limited interruption or added cost.

The existing local, state, and federal laws and procedures which currently govern the use and management of water resources and the management of private lands remain in effect regardless of designation. Ownership of lands is not transferred with designation; those who previously owned lands still own the same lands after designation.

Designation does not restrict recreation on or access to the rivers, in fact, improvement of access, and support of hunting, fishing, canoeing, and other recreational activities are management recommendations which this Plan supports.

III.d.ii. Examples of Wild and Scenic Success

"As to successes, we have produced a 22 minute video about the river, and have offered grants to enhance our outreach efforts. We have also supported watershed-wide activities such as a conference last June to support watershed planning. We've published a curriculum for grades 3-12, developed a recreational map for the 23.5 miles of the river that are in the Wild and Scenic Rivers program, and are currently working with the town of Durham on a small park. We have some wonderful partners in our endeavors and we strive to work more closely with the four towns in the Wild and Scenic portion of the river."

~Sharon Meeker from the Lamprey River (NH) designated in 1996

It is good to see that the study group is exercising due diligence in evaluating the pros and cons of establishing a Wild & Scenic River designation along the Missisquoi & Trout Rivers. In regards to impacts a designation would have on the State of Vermont Agency of Transportation's or affected municipalities' ability to delivery federal aid transportation projects I do not see any areas of concern. Under the existing NEPA and ACT 250 permitting requirements we already involve numerous parties in our project development process and any added time and cost a Wild & Scenic designation could impose is likely to be minimal at most. Vermont has established a strong heritage of environmental stewardship and a designation would dovetail seamlessly with our State's culture including that of the Agency of Transportation.

~Richard Tetreault, Director of Program Development/Chief Engineer, Vermont Agency of Transportation

The Study Committee contacted individuals involved with federally-assisted projects on other Wild and Scenic Rivers. Ed Lausier, from MassDOT, who worked on replacement of the McNerney Road Bridge in the designated Westfield River (MA) watershed, said that Section 7 Review resulted in a "better project" in the end because the project became more aesthetically pleasing and allowed for fish passage upstream. Mr. Lausier believes that by contacting the NPS and Wild and Scenic Advisory Committee early in the planning process, any unnecessary delays or increased costs were avoided and he noted that NPS was "excellent" to work with.

Bob Bennett, also from MassDOT, was working on a bridge replacement project on the designated Taunton River (MA). The project was going to close the river to canoeing for up to a year heavily impacting this important recreational river reach. Bob felt the process/involvement of the NPS and Wild and Scenic Advisory Committee "went well" and helped limit the amount of recreational disruption.

~ Massachusetts Department of Transportation Employees Ed Lausier and Bob Bennett

The following are examples of the types of projects which other post-designation advisory committees have accomplished since Wild and Scenic designation toward the preservation and management of the locally identified Outstandingly Remarkable Values. Should the upper Missisquoi and Trout Rivers be designated, these efforts are voluntary, and towns and private landowners are not obligated to participate or contribute funds to such efforts.

≈ **Westfield River, Massachusetts**

Road runoff and erosion study – The Wild & Scenic Committee has helped MA towns realize savings by enabling them to work cooperatively with neighboring towns. For example, the towns are working together on a drainage study to gain a greater understanding of road runoff and erosion along the river. The study will cost approximately $22,000 and will assess approximately 42 miles of road, develop Best Management Practices, prepare conceptual designs and provide cost estimates for improvement. The goal is to have the Committee provide future matching funds to implement the BMP recommendations and to pursue larger sources of grant funding.

≈ **Eightmile River, Connecticut**

Stormwater management – Jim Ventres, Land Use Administrator for the Town of East Haddam, which is in the Wild & Scenic designated Eightmile River Watershed, reports that the Eightmile River Wild and Scenic Coordinating Committee is applying for grant funds for identifying and mapping the location of all of the storm drains in East Haddam, Salem and Lyme, and for reviewing the adequacy of the stormwater systems. The grant money, from the Long Island Sound Future's Fund, would provide an opportunity for the three towns to take a proactive, comprehensive approach to stormwater management which may not have been affordable without Wild and Scenic funding and support.

≈ **Upper Farmington River, Connecticut**

Small grant program funding local activities – The Wild & Scenic Committee is particularly proud of their Grants Program that over the past four years has awarded funding to: Camp Jewell in Colebrook, Farmington River Angler's Association, Roaring Brook Nature Center in Canton, Barkhamsted Historical Society, Trout Unlimited, start-up funding for the Hartland Land Trust, Barkhamsted Conservation Commission, Aton Forest Inc. of Norfolk, Town of New Hartford, Colebrook Land Conservancy, and New Hartford Land Trust.

Informational kiosks – The Farmington River Coordinating Committee (FRCC) completed informational kiosks at key locations along the Farmington River.

Angler access – The FRCC continued work with organizations to create an angler's trail where

anglers could safely access the river without eroding riverbanks at appropriate locations with permission of landowners.

Lamprey River, New Hampshire

History and archeology projects – John Hatch Memorial Park Development: The Lamprey (post-designation) River Advisory Committee has worked for over a decade with the Town of Durham to develop this riverfront park including: stabilization of archaeological remains, improvements to public access, installation of an information kiosk at the Wiswall Dam, construction of public safety fencing, and participation in design and installation of a fish ladder at the Wiswall Dam primarily with federal funding.

≈ **Sudbury, Assabet and Concord Rivers (SuAsCo), Massachusetts**

Music /Arts – "Gifts of Great Meadows" is a slide presentation with musical accompaniment composed by Richard Sebring, horn player with the Boston Pops. The slides of winter ice formations along the river are complemented by seasonal music. This video was supported in part by the Wild & Scenic Committee, Sudbury Valley Trustees and US Fish and Wildlife Service. It was introduced by Keith Lockhart, and performed at all Pops concerts in the 2009 winter season. It is a beautiful example of the inspiration created by these rivers.

Invasive species management – The SuAsCo Wild & Scenic Committee provided the $2,600 seed funding and two other grants of $5,000 and $6,000 to create and give project support to the Cooperative Invasive Species Management Area that was established to address the growing threat to resources from the rapid spread of invasive species. Twenty-three organizations have signed onto the project, including government agencies, conservation commissions, land trusts and other non-profits. Leveraging of the initial seed money has taken form in volunteer hours, a $15,000 grant from the National Fish and Wildlife Foundation and matching funds of $11,000 from the Sudbury Foundation. This initial investment has leveraged staff time from other organizations, given a more competitive chance of receiving grant money, and improved the ability to tackle regional issues collaboratively.

Boater's Trail/Recreational Map – National Park Service staff wrote a proposal to the Massachusetts Department of Conservation and Recreation for an $8000 grant that resulted in a Sudbury River Boater's Trail. It is available as an interactive map on their website at http://www.sudbury-assabet-concord.org/.

III.d.iii. What Designation Does NOT Mean

During its investigations, the Study Committee considered a number of questions about possible negative effects of Wild and Scenic designation. Some were questions that Committee members themselves had; others were the result of public input. All fell into two general groups: those with clear answers (the overwhelming majority), and those which were not readily answered with certainty. For questions in the first group, the Study Committee found that there would not be any significant negative effects (see bulleted list below). For questions in the latter group, the Study Committee determined that negative effects were unlikely, and could be easily mitigated through the voluntary implementation of certain recommendations contained in this Management Plan. The Study Committee further determined that, even absent such implementation, the positive benefits of Wild and Scenic designation appeared to outweigh any possible negative effects.

The following information is provided to address some of the possible concerns of community members and answer the more frequently asked questions about designation.

≈ Existing local and state laws still govern regardless of designation – private lands and activities will not be subject to increased federal control

≈ Management Plan recommendations are voluntary, and will not result in increased costs to towns or private landowners for activities on their property

≈ Existing land uses may still occur regardless of designation (the only regulatory changes are no new federally funded or permitted dams or hydroelectric projects on the designated reaches, and review of projects by the NPS and post-designation Advisory Committee if proposed projects are federally funded or permitted wholly or in part, construction and development, and water resource related – see Section c above)

≈ Local planning and zoning boards will continue to make regulatory decisions regarding land use

≈ Designation does not affect pre-existing, licensed or exempt hydroelectric facilities such as those in Troy and Lowell. It also does not prevent existing dams from being retrofitted for purposes other than hydroelectric power

≈ The Study Committee does not oppose alternative power generation such as hydroelectric power, in fact the Committee voted not to impede the progress of the renovation of the Chase Hydroelectric Dam in Troy, and to exclude their property from consideration for designation

≈ Though not applicable in the east due to differing water resource management, many community members are most familiar with Wild and Scenic Designation in the west where water rights state that Federal water rights are junior rights to those existing at the time of designation

≈ The federal government may not acquire lands to implement the designation. The Study Committee recommends that language barring federal land acquisition be affirmed in any legislation enabling designation

≈ The federal government may not use takings to take lands or create easements. Again, the Study Committee recommends that language barring federal takings be affirmed in any legislation enabling designation

≈ Hunting and fishing laws and regulations are not affected by designation, and the Study Committee is suggesting improving angling access along the rivers whenever possible

≈ Agricultural practices are not impacted by designation. The same regulations that govern agricultural practices prior to designation will continue to govern post-designation; if desired Wild and Scenic funding may help farmers improve water quality practices which they may not previously have been able to afford

Below are some of the questions that the Study Committee could not answer immediately with certainty but which the Study Committee felt can be addressed by implementation of the voluntary recommendations in this Plan:

≈ *Will designation result in increased tourism or recreational use of the rivers?* Not significantly. Tourism and recreational use on other rivers in the Wild and Scenic System have not seen dramatic increases in either tourism or recreational use attributed to Wild and Scenic designation. The degree to which such traffic increases largely depends on the extent to which the riverfront communities choose to promote the river and tourism beyond the initial Wild and Scenic designation by Congress.

≈ *Will any increased traffic negatively affect the rivers, adjacent property, or landowners?* Unlikely and manageable. Should these negative affects occur, the Advisory Committee could help mitigate any impacts of increased traffic due to Wild and Scenic designation.

≈ *It is possible that increased recreational use of the rivers could contribute to erosion at river access points?* Any additional erosion could happen regardless of designation. The Scenic and

Recreational ORV chapter discusses recommendations for access points, and addresses this undesirable potential.

≈ *How Does the Study Affect My Land?* It does not. If you perceive any impacts at all, please contact us right away. Please see the Section 7 review section of this document for more information about the types of federal projects which require review. Projects on private property that occur without federal permitting or funds remain governed by the local and State laws which governed them prior to designation.

≈ *What will happen to my property rights if the river is designated?* Nothing. Respect for private property rights and current land uses are fundamental components of long-term support for river protection, thus preserving them is essential to the success of designation. One can look to other Partnership Wild and Scenic rivers in New England for evidence of this.

≈ *How will my town benefit if this designation occurs?* Such a designation would likely bring federal technical and financial resources to help enhance and protect the river. Some studies have shown that there is an economic benefit to communities that value their rivers and promote them as a recreational resource (one such study is available on FRWA's website, www.frwa.org).

≈ *Could the Study or designation result in federal control of my property?* No. The Study is only that, a study. There is no authority for federal land use control associated with a Wild and Scenic designation. Town and State governments would continue their primary role in establishing and enforcing land use.

≈ *Would a National Wild and Scenic River designation "federalize" the Missisquoi and Trout Rivers, resulting in federal control of a corridor along the rivers?* No. The federal government will not take control of these rivers. There is no federal mandate requiring specific land use controls related to the National Wild and Scenic Rivers System that will affect how a landowner can use their property. Again, see the Section 7 review information in this Plan for the few regulations on federal projects which come with designation.

In the end, the Study Committee determined that these concerns and questions were addressed with an understanding of designation, and appropriate management recommendations in this Plan.

III.e. Summary of Study Committee Findings

The Upper Missisquoi and Trout River Wild and Scenic Study have found the mainstem of the upper reaches of the Missisquoi River from the falls in Enosburg Falls to the headwaters in Lowell and the entirety of the Trout River to be eligible for designation as Wild and Scenic Rivers. These river segments meet the definition of free-flowing and possess a number of Outstandingly Remarkable Values. These segments are recommended for designation as "recreational" under the National Wild and Scenic Rivers Act. The classifications identified in the Act are as follows:

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

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

Recreational River Areas – *Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past (www.rivers.gov).*

We recommend seeking town approval for Congressional designation of the upper Missisquoi and Trout Rivers as additions to the National Wild and scenic River System and that efforts are made, regardless of designation, to maintain, enhance and protect the Outstandingly Remarkable Values using these Management Plan recommendations as a guide.

For more information about the Study Committee and the Study culminating in the development of this Management Plan, please see Chapter I of this Plan. See also Chapter VI of this Plan for a summary of the Study Committee recommendations for designation.

Regardless of designation, this Management Plan is available for local, state, and regional use for management of the upper Missisquoi and Trout Rivers.

Chapter IV. Local River Values

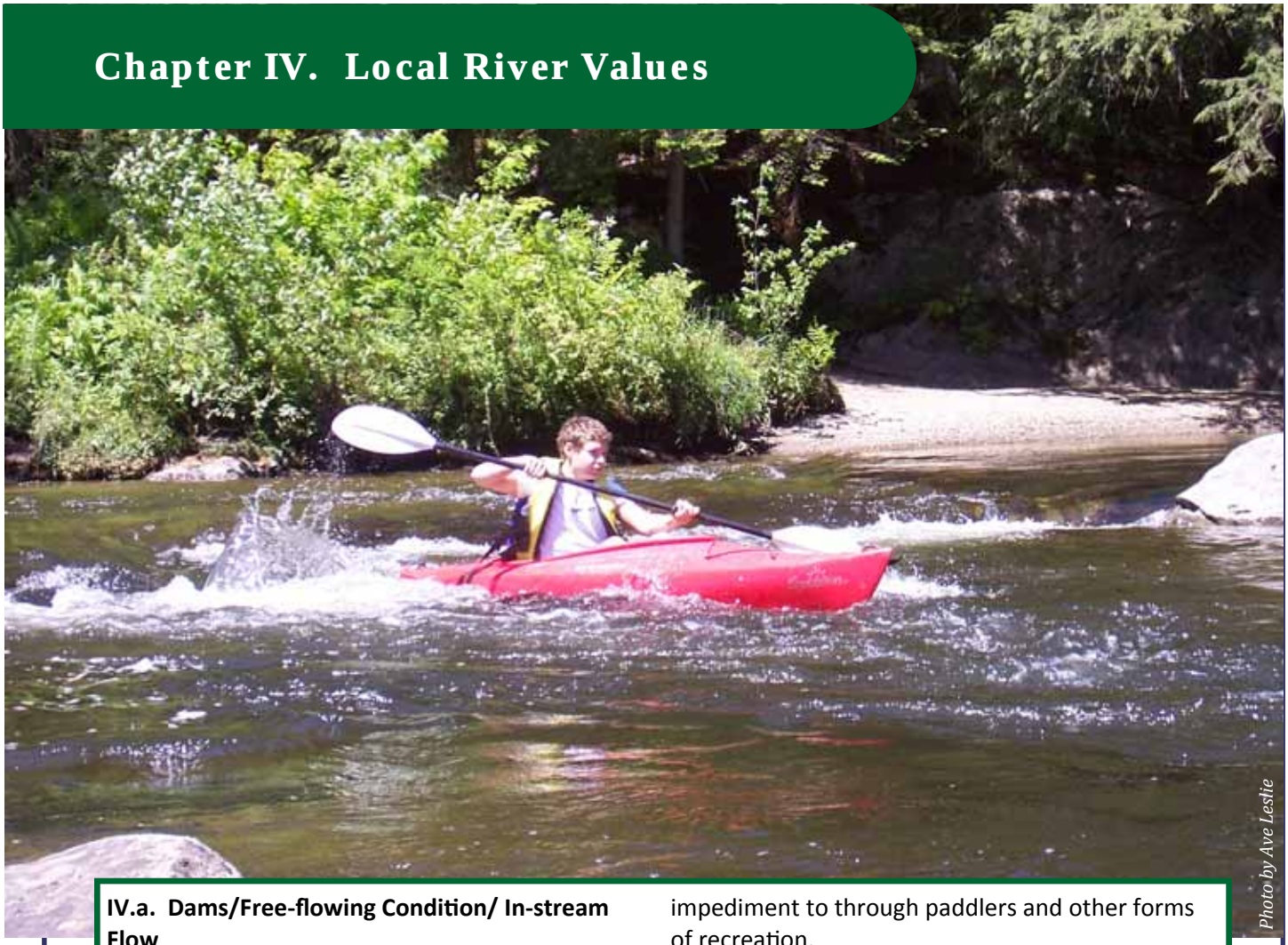


Photo by Ave Leslie

IV.a. Dams/Free-flowing Condition/ In-stream Flow

Dams can benefit society through providing local, renewable energy through hydropower generation; recreational opportunities (such as open water boating and fishing); water storage for drinking or irrigation; and flood control.

Dams can also degrade the river system though declines in water quality and habitat such as: low flow that does not sustain fish and other aquatic biota; armoring of boulders which become deeply embedded in substrate sediment and unavailable as habitat; increases in water temperature as the slow water has more time and exposure to absorb heat from the sun; higher algal abundance (eutrophication); lower dissolved oxygen (DO) levels; and changes to the in-stream fisheries including a blocking the migration of spawning fish and a move away from native brook trout populations. Additionally, they often provide an impediment to through paddlers and other forms of recreation.

The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee is not generally against dams or hydropower; however, a central goal of the Wild and Scenic Rivers Act (1962) is to "preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations…To accomplish this, the act prohibits federal support for actions such as the construction of dams or other instream activities that would harm the river's free-flowing condition, water quality, or outstanding resource values."

The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee has assessed the dams existing on the rivers in conjunction with the help of the Agency of Natural Resource's Department of Environmental Conservation's Streamflow Protection Coordinator (Brian Fitzgerald at the time

of writing this Management Plan) to see if the existing dams are compatible with the free-flowing river condition necessary for designation. The following dams exist in the Study area section being recommended for designation (if you know of another, please inform us immediately).

- The Troy Hydroelectric project in Troy on the Missisquoi River has not operated since 1998. The project received from the Federal Energy Regulatory Commission (FERC) an exemption (FERC Project Number P-13381 in 2001). As of October 2012, work is underway on the civil works to restart the project. The NPS and Study Committee have already indicated to FERC in writing that this project (including the project lands owned by the Chase family) will be excluded from the designated area, and that its proposed operation as a run-of-river facility will not have an adverse impact to potential Wild and Scenic River areas upstream or down.

- The North Troy Project (formerly Missisquoi River Technologies) on the Missisquoi River in the Village of North Troy is not-operating and has a FERC exemption (FERC P-10172) issued in 1989. The project was acquired by Missisquoi River Hydro, LLC, and the new owners who are actively seeking to renew operations (perhaps as early as the fall of 2012). Designation would have no effect on the existing FERC exemption for this facility. This facility, at the beginning of the backwater of this impoundment, will be excluded from the designated area. Wild and Scenic designation should have no effect on this facility unless there are significant changes proposed for this operation - in which case the changes would need to be reviewed to ensure no adverse impact to the designated area.

- The Kendall Plant in Enosburg Falls on the Missisquoi River, operating and licensed by FERC (FERC P-2905, license expires 2023). This facility will not be part of designation, since the designated area will be defined as beginning at the backwater of this impoundment. Wild and Scenic designation should have no effect on this facility unless the there are significant changes proposed for this operation - in which case the changes would need to be reviewed to ensure no adverse impact to the upstream designated area.

Figure 10. The Kendall Plant Dam at Enosburg Falls. *Photo by Ken Secor.*

Other dams in the Study area municipalities are located on tributaries or on areas of the rivers outside of the area currently under consideration for designation. These dams and hydroelectric facilities are deemed incompatible with designation. Exclusion of segments with large dams or hydropower operations is acceptable and appropriate along designated rivers. As a result of the dam assessment, all three of the dams listed above are being recommended for exclusion from the designated reaches.

The Study Committee also researched possibilities for new dams in the Study area through discussion with local community members and through the use of resources such as the Vermont Center for Geographic Information, the Vermont Renewable Energy Atlas, and the Department of Energy's Virtual Hydropower Prospector. It was found that along these sections of the upper Missisquoi and Trout Rivers which are being considered for designation that there are not both economically viable and environmentally permittable (meaning allowed by current State permitting requirements) sites. There are environmental, economic and permitting hurdles to surmount when

considering building a dam irrespective of Wild and Scenic designation, and that these hurdles often keep owners from pursue dam and hydroelectric projects.

According to Brian Fitzgerald, Vermont Agency of Natural Resources, and Duncan Hay, National Park Service's Hydropower Relicensing Program, most economically feasible and power producing hydropower sites in Vermont were identified and developed in the alternative energy boom in response to the oil crisis in the late 1970s and early 1980s. It is very unlikely that a new, large hydro project would be proposed and viable in our study area. The biggest potential would be at Big Falls which is a State Park, and one of the Study Committee's identified Outstandingly Remarkable Values (ORVs) as it is the tallest undammed falls in the state of Vermont.

Wild and Scenic designation would not prohibit small, non-FERC-jurisdictional projects on tributaries, though they would still fall under the purview of the State of Vermont and need to satisfy all existing, relevant state and local laws and regulations.

More information on dams and Wild and Scenic may be found in Appendix 10: The *Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee Fact Sheet on Dams and Hydroelectric Power*.

Approximately 50 miles of the upper Missisquoi River and 11 miles of the Trout River meet the free-flowing criteria for Wild and Scenic River eligibility under "recreational" classification. The sections being recommended for designation include: the Missisquoi River from the confluence of Burgess Branch and the East Branch of the Missisquoi in Lowell to the Canadian border in North Troy (excluding the project areas of the Troy and North Troy Hydroelectric Facilities), from the Canadian border in Richford to the beginning of the project area of the Enosburg Falls Hydroelectric facility; and the Trout River from the confluence of Jay and Wade Brooks in Montgomery to when it joins the Missisquoi in East Berkshire.

Current river flows are adequate to support the in-stream values for which the rivers are being considered for designation. River flows are typically unaltered on the sections under consideration for designation, and areas where flow is altered, such as dams, are being excluded from the section proposed for designation. Should there be proposals for changes to the river flows, or natural conditions change making the current flow alterations allowed unsustainable (such as changes in weather conditions and climate), a flow study should be conducted and

Figure 11. Canoe on the bank of the Missisquoi River above Richford. *Photo by Ken Secor.*

flow regulations established which require optimum flows that support the rivers' fisheries, biological function, water and habitat quality, recreational opportunities, and aesthetic and scenic qualities. Such as study could also assess whether future water allocation demands and flows are compatible with the Outstandingly Remarkable Values (see below) for which the rivers are eligible for designation. More information on flow alterations may be found on the State ANR website or in the most recent version of the Missisquoi Basin Watershed Water Quality Management Plan.[1] The State of Vermont also has information on flow including determining acceptable minimal stream flows and guides to dams and dam removal.[2,3]

IV.b. Outstandingly Remarkable Values (ORVs)

IV.b.i. An Introduction to the Outstandingly Remarkable Values (ORVs) of the Upper Missisquoi and Trout Rivers Wild and Scenic Study Area

The Wild and Scenic Rivers (WSR) Act[4] of 1968 seeks to preserve rivers that "possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values." Wild and Scenic river designation is based upon these Outstandingly Remarkable Values (ORVs).

To be eligible for designation, a river must be free-flowing and possess one or more ORVs. The Act intentionally does not clearly define ORVs, because they should be unique to each river and determined during the Study period. While the range of resources that may be included as an ORV is broad, all values should be river-related. Though the rivers have many valuable resources, in order to be an ORV the Wild and Scenic Act states that the resource "should:

1. Be located in the river or on its immediate shorelands (generally within 1/4 mile on either side of the river);
2. Contribute substantially to the functioning of the river ecosystem; and/or
3. Owe their location or existence to the presence of the river."

These ORVs must also be significant at a regional or national scale. (For more information about ORVs and the part they play in the federal designation process, see the National Parks Service online document entitled The Wild and Scenic River Study Process.[5]) Upper Missisquoi and Trout River ORVs were identified by the Study Committee through research at Committee meetings, input from community members, and discussion with local and state experts on the rivers. Time was allotted at several public, monthly Committee meetings for discussion of ORVs. Further feedback was solicited from the general public via emails and social media outlets. Maps showing potential ORVs from several categories were presented to community members to facilitate the discussion. The final list of ORVs in the Study area was completed and is included in the sections below. ORVs were found in the following categories: Scenic and Recreational; Natural Resource; Water Quality; and Historic and Cultural. Many ORVs may fall into multiple categories. When this is the case they are described fully under one heading and also mentioned in the other relevant categories. Maps may be found a the end of this Plan.

The location of ORVs may be sensitive and given generally, rather than pinpointed specifically, to protect the resource. For example, the exact location is withheld where a rare species has been found, or an area that is on private land and does not have public access. Specific information about ORVs with such sensitivity has been omitted from their description in order to preserve their quality and longevity.

Should the Upper Missisquoi and Trout Rivers be designated as Wild & Scenic, it will be the charge of the locally appointed post-designation Wild and Scenic Advisory Committee to preserve and perhaps enhance the ORVs of the designated area through the recommendations which follow. To this end, it is important to identify the current threats, current legal protections and current gaps in legal protections for each ORV. In addition to this chapter, protections for these ORVs are also detailed in the Protection Appendices for each category. It is the hope of the Committee that regardless of designation the analysis below will lead to informed management decisions regarding the rivers and their ORVs.

The following sections of this chapter detail the Outstandingly Remarkable Values, ORVs, agreed upon by the Upper Missisquoi and Trout Rivers Wild and Scenic Study in the Scenic and Recreational; Natural Resource; Water Quality; and Historic and Cultural categories.

Note: ORVs are listed first in Franklin then in Orleans County listed alphabetically by town.

Endnotes

[1]Missisquoi Bay Watershed Planning in the VT Watershed Management Division: www.anr.state.vt.us/dec/waterq/planning/htm/pl_missisquoi.htm

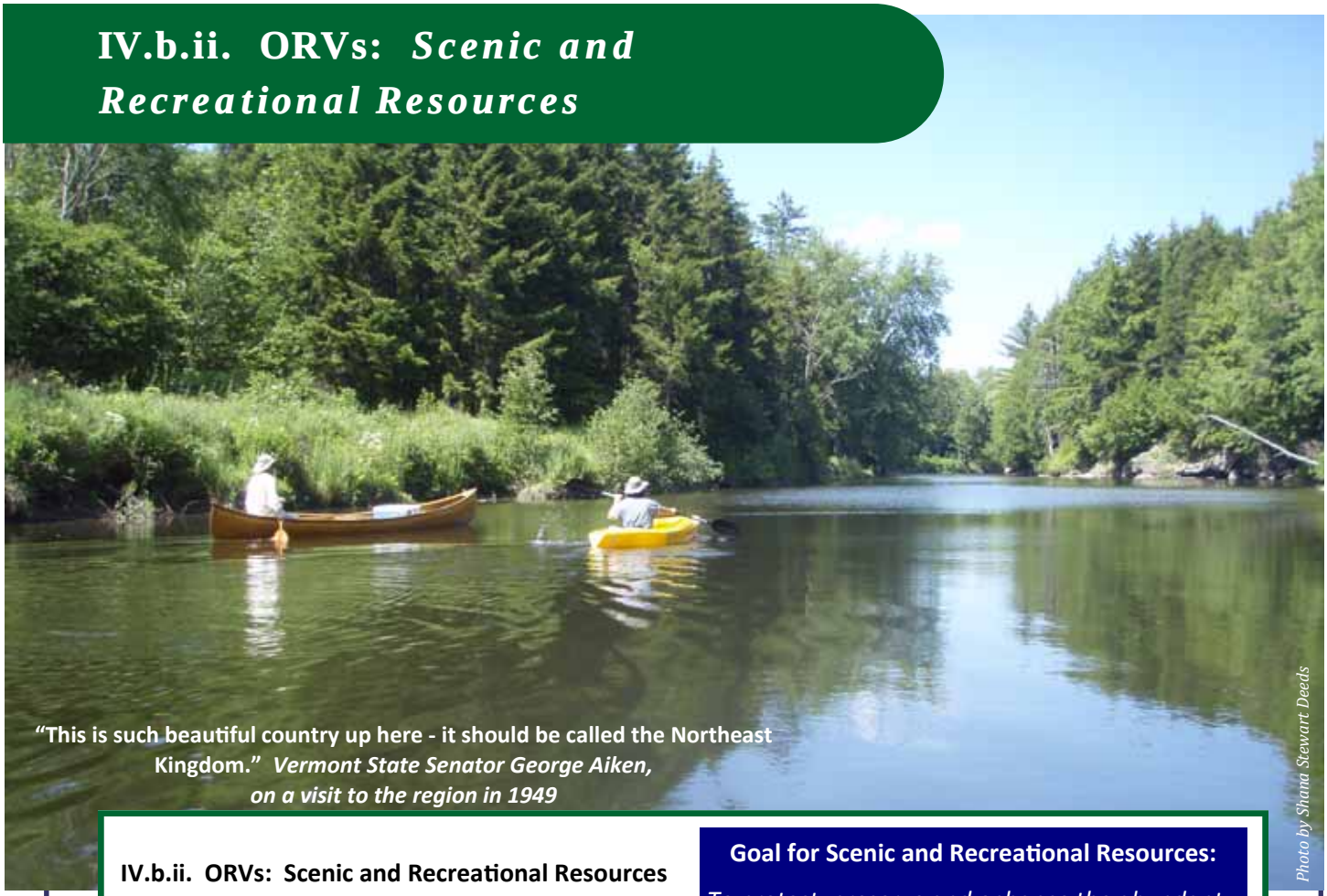
[2]Determining Acceptable Minimal Stream Flows: www.anr.state.vt.us/dec/waterq/rivers/docs/rv_flowprocedure.pdf

[3]User's Guide to Dam Removal in VT: www.anr.state.vt.us/dec/waterq/rivers/docs/drw_usersguide.pdf

[4]WSR Act: rivers.gov/publications/wsr-act.pdf

[5]"The Wild and Scenic River Study Process" (1999): rivers.gov/publications/study-process.pdf

IV.b.ii. ORVs: *Scenic and Recreational Resources*



"This is such beautiful country up here - it should be called the Northeast Kingdom." *Vermont State Senator George Aiken, on a visit to the region in 1949*

Photo by Shana Stewart Deeds

IV.b.ii. ORVs: Scenic and Recreational Resources

IV.b.ii.1. Overview of Scenic and Recreational ORVs:

Scenic and recreational opportunities, which abound on the Missisquoi and Trout Rivers, consistently rise to the top of the list of outstanding resources identified by the communities in the Study area. Community members are tied to these rivers through their enjoyment of recreational activities, especially canoeing and kayaking, fishing and hunting, swimming, hiking and wildlife viewing. According to the Missisquoi Valley Rail Trail website the scenic views of the Missisquoi are a draw for those using the trail, artists are inspired to create landscape paintings here and wildflowers and wildlife may be seen from the trail. It is not surprising to local residents and visitors that the Missisquoi and Trout Rivers are enjoyed for their scenic beauty and recreational opportunities. According to the Northeastern Vermont Development Association (NVDA) over 70 million people are within a day's drive of the recreational resources in the Northeast Kingdom. The Northwest Regional Planning Commission and the NVDA, in their regional plans, have a vision for continuing and increasing recreational opportunities within the Study area while also providing opportunities for growth. The Study Committee supports the protection of the scenic and recreational resources in the Study area as Outstandingly Remarkable Values. The following sections highlight some of the valued scenic and recreational resources in and around the upper Missisquoi and Trout Rivers.

Goal for Scenic and Recreational Resources:

To protect, preserve and enhance the abundant scenic and recreational opportunities in the area that relate to the river and its enjoyment by the public. To support the maintenance of adequate access opportunities to the river that allow for appropriate river uses while protecting the water quality, integrity of the riparian areas, and the surrounding environment of the river.

Featured ORV: Swimming Holes

Recreation opportunities enhance the quality of life for residents and tourists alike, and contribute significantly to the regional economy.

—Northeast Vermont Development Association[1]

The numerous swimming holes in the Study area are a popular destination for locals and visitors alike. Yankee magazine featured the Three Holes swimming area (on the Trout River in Montgomery) as the Best Local Secret and swimming hole in New England in their May/June 2010 Issue: "As the Trout River sluices down from the hills, it fills three natural basins deep in the woods, creating the swimming-hole trifecta: diamond-clear water, flat rocks for sunbathing, and freedom from raucous crowds."[2] The countless pools and falls of the Trout River in Montgomery have created many swimming areas in the Town. There are also popular swimming holes in the towns of Lowell, Westfield and Troy (see the list below). Mel Allen, also published in Yankee Magazine, touts the gift of swimming holes for cooling off after a hard day's work. According to their Executive Director, Steve Libby, the Vermont River Conservancy's mission of "protecting exceptional lands along our waters" puts protecting swimming holes and access to them as a top priority, and the organization has worked to protect several in Vermont.

Figure 12. Swimming area in the Trout River in Montgomery. *Photo by Corrie Miller.*

Focus on ORVs:
Four Corners, or Jay Branch Gorge

Four Corners, or Jay Branch Gorge, is a swimming hole often used and easily accessible from Jay Four Corners Store off of Route 101. Listed by newengland-waterfalls.com as a premier swimming hole in Vermont, this hole has beautiful waterfalls cut into the bedrock (Ottauquechee Formation of black phyllite or schist with quartz). A deep swimming pool may be seen below the cliffs and waterfalls. In order to keep this wonderful swimming hole, and others, accessible to the community, please:

≈ do not trespass on posted private property

≈ avoid bringing glass to swimming areas

≈ remove all trash, pack in and pack out

≈ be safe – avoid diving headfirst, swimming alone, drinking alcohol, or climbing cliffs around the falls

Three swimming holes from the Wild and Scenic Study area are featured in the recently released *Take the Plunge: An Explorer's Guide to Swimming Holes of Vermont*, by David Hajdasz.[3] Gibou Bridge Swimming Hole on the South Branch of the Trout River in Montgomery, Hippie Hole (also known as Crystal Falls) on West Hill Brook in Montgomery, and the Four Corners Swimming Hole on Jay Branch in Troy are highlighted as some of Vermont's must-see attractions.

Opportunities for Action: Swimming Holes

The post-designation Wild and Scenic Advisory Committee could serve as a resource for communities, landowners and recreational users to ensure that these special places remain open to the public, safe, free from litter and an asset to our communities and the region. The Committee could encourage some of the following actions:

≈ Develop an Adopt-a-Pool access program for swimming holes (and fishing/boating access). At least one in each town should be monitored and cleaned up twice per year by volunteers

≈ Seek donated trash collection services to bus the trash to the local transfer station once each week

≈ Pursue more formal agreements for public access/permission to use swimming holes

≈ Seek to develop relationships with landowners so that issues can be identified and addressed

Featured ORV: Covered Bridges

Covered bridges are a sought-after recreational attraction for people interested in cultural heritage and scenic beauty. Six of these covered bridges, all built by the same family – the Jewett Brothers – are still standing, and are in use today in the Study area in Montgomery. The Montgomery Historical Society asserts that his represents the most covered bridges within one Town in the country. There are also scenic covered bridges located in Enosburgh and Troy. More information about these highlighted ORVs may

Focus on ORVs: The Northern Forest Canoe Trail (NFCT)

The Missisquoi River is part of the Northern Forest Canoe Trail,[4] which is a 740-mile, long-distance paddling trail that connects waterbodies from the Adirondack mountains of New York to the unspoiled wilderness of Northern Maine. The portion of our Study area that joins the trail is the Missisquoi River from the Canadian Border in Richford to the downstream end of the Study area in Enosburgh Falls (Section 5). Walter Opuszynski, NFCT's Trail Director, states that paddlers within the Study area work their way through a unique NFCT landscape of verdant farmland and a break in the Green Mountains before crossing into Canada. The NFCT has found great support from these communities, and an obvious desire to respect these waters for their natural beauty, history, and ecological importance.

NFCT's paddlers rely on the opportunity to follow the historic travel corridors used by generations of inhabitants from the Abenaki to early settlers to present-day paddlers. The Missisquoi lies in the heartland of the Northern Forest Canoe Trail, and Walter feels it creates a unique connection of people and land including a significant international connection to Canada.

The NFCT organization has 5 designated access areas along this reach of the river, as well as a number of campsites and informational kiosks. American Rivers, a national organization dedicated to protecting rivers and streams, recently partnered with the National Park Service to create *River Stories*, a collection of information and photographs highlighting water trails around the nation. According to their website, River Stories highlight ten U.S. rivers, including the Missisquoi section of the NFCT, in the U.S. which "offer outstanding recreational opportunities." Keith Sampietro, a local business owner of Montgomery Adventures, has worked with the Northern Forest Explorers Youth Program for youth to get them paddling on the upper Missisquoi. Business such as Keith's are great examples of how healthy rivers, such as the Missisquoi and Trout, afford opportunities for rural economic development.

NFCT was recently named "2011 Best Canoe Trail" by Outside Magazine,[5] and is clearly one of the Outstanding Remarkable Recreational and Scenic Values along the upper Missisquoi River.

"In 2012, the Northern Forest Canoe Trail launched its Trail Town Initiative. The goal is to develop coordinated, cross-sector networks to leverage the recreation and natural resource assets that are core to the future vitality of the region's rural communities." The Town of Richford was chosen as a Trail Town. NFCT staff members will work with trail towns, such as Richford, to apply for grants and implement priority actions for the waterway. This designation helps Richford move toward becoming a local recreational hub.

be found in the Historic and Cultural chapter of this Management Plan.

Featured ORV: Paddling (Canoeing and Kayaking)

Canoeing and kayaking opportunities abound along the Missisquoi and Trout Rivers. The rivers offer unique experiences for all levels of paddling, from gentle meandering float trips to technical whitewater runs. The Study rivers wind their way through rolling forested hills, towering floodplain forests, and picturesque working farm fields. With approximately 25 distinct access sites along the 70 miles of the Study rivers, there are ample opportunities for nearly everyone to enjoy a day on the river. Please see the online Appendix 11 (www.vtwsr.org) for a paddle tour.

Figure 13. Study Committee member John Little navigating a section of rapids on the Missisquoi River above Richford. *Photo by Ken Secor.*

Opportunities for Action: Paddling (Canoeing and Kayaking)

The post-designation Wild and Scenic Advisory Committee could serve as a resource for communities, landowners and recreational users to ensure paddling opportunities on the Missisquoi and Trout Rivers are easily and safely accessible. The Committee could encourage some of the following actions:

≈ Work with the Regional Planning Commissions to enhance nature-based recreational activities in the region while also working to increase sustainable access points so increased traffic doesn't strain already limited access areas

≈ Partner with local organizations to negotiate agreements with willing landowners to establish and maintain official access points

≈ Assist with the upkeep of river access points by continuing river cleanups and other stewardship opportunities

≈ Help map official access points where landowners are amenable to doing so

≈ Work with local groups to educate landowners and recreational boaters to reduce the impact of non-native invasive species

≈ Work with the Regional Planning Commissions to create a network of feedback and maps for recreational users (along with an ingoing survey of use numbers) so that recreational opportunities may be coordinated throughout the Study area that best meet user needs

≈ Work with towns who wish to increase recreational ecotourism in the area

≈ Support and partner with local organizations (such as the Northern Forest Canoe Trail, Hazen's Notch Association, Trout Unlimited, Missisquoi Valley Rail Trail Association, local conservation organizations and historical societies) on vibrant recreational opportunities in the Missisquoi and Trout Watershed which are compatible with river water quality and protection

Featured ORV: Fishing

Fishing and hunting were historically important along the Missisquoi and Trout Rivers with the Abenaki peoples and remain important to the area residents

today. There are significant opportunities for sport fishing in the Upper Missisquoi and Trout Rivers. The rivers hold quality fish habitat throughout the Study area, supporting both warm- and cold-water fisheries (native fish populations are discussed more in the Natural Resources section of this Plan). The upper reaches of the Missisquoi and the entirety of the Trout River offer excellent trout fishing, and serve as a destination for anglers across the region. The Trout River and many of its tributaries support especially healthy cold water fisheries. Many well-known trout fishing spots overlap with other features noted in this Management Plan. The Hopkins and West Hill Brook covered bridges and swimming holes are destinations for trout anglers. Black Falls Brook and Alder Brook are also good fishing spots in the Study area. Jay Branch, Hanna Clark and Wade Brooks all offer trout fishing in addition to whitewater paddling opportunities.

The lower reaches of the Upper Missisquoi offer fishing opportunities for warm-water species, such as large- and smallmouth bass, chain pickerel and yellow perch. Downstream of Enosburg Falls, just below the Study area, the Missisquoi Rivers is a State -Designated Warm Water Fishery, which means that State law requires that minimum levels of dissolved oxygen be maintained in these waters. The lower reaches of the Missisquoi, especially bellow the Swanton Dam, support a number of warm water sport fish species associated with Lake Champlain, including walleye, northern pike and muskellunge. Although not part of the Study area, the species downstream depend on the water quality of the Missisquoi River, which is directly related to management of our Study area. Lake Champlain International is involved with fishing and conservation initiatives, and their website is a good place to visit for information on local fishing derbies and events. Current fishing access maps may be found online.[6]

Figure 14. Family fishing on the Trout River. *Photo by Brenda Elwood.*

Other ORVs

Biking

Road cycling is very popular in Vermont, and the Study area is no exception. The Outdoor Institute estimates that 29% of the State's population is active in either road cycling or mountain biking, and the Upper Missisquoi and Trout Rivers Study area offers both. Route 100 is an extremely popular road cycling route for Vermonters and out-of state visitors. The organization Bike New England calls this route one of the "must-do bike rides in New England."[7] This route parallels the upper portion of the Missisquoi River in Lowell, Westfield and Troy. Many of the Class 4 roads within the Study area provide great opportunities for road biking, and are enjoyed by local cyclists and visitors.

The Missisquoi Valley Rail Trail stretches over 26 miles between Richford and St. Albans, VT. The trail was named one of *Yankee* magazines top-five New England bike tours in 2009.[8] This a family-friendly bike trail that follows the Missisquoi River through the Study towns of Richford, Berkshire, Enosburgh and Enosburg Falls was originally the railroad bed for the Central Vermont Railway's Richford Branch (more information below).

Hiking/Biking/Skiing Trails

The northern Green Mountains offer many hiking possibilities in the Study area. Many peaks are readily accessible to area visitors, allowing for everyone from outdoor novices to seasoned

Figure 15. Biking on the Missisquoi Valley Rail Trail. *Photo by David Juaire*.

mountain climbers to find a suitable hike and several afford great views of the Missisquoi and Trout Rivers below. The Catamount Trail is a 300-mile trail that stretches between Vermont's northern and southern borders. It was established for winter use, primarily for cross-country skiing and snowshoeing, and is the nation's longest Nordic ski trail. It passes through the Study area towns of Lowell, Montgomery, Westfield and Jay, and reaches its northern terminus near North Troy (see the Scenic/Rec ORV map).

Outdoor centers like the Hazen's Notch Association and Jay Peak Resort provide a great starting place to those unfamiliar with the area. Hazen's Notch Association offers year-round recreational possibilities, but in winter is a renowned destination for Nordic (cross-country) skiing and snowshoeing. According to their website, the Hazen's Notch Association Trails are surrounded by wonderful views of several nearby mountain ranges including the Jay, Cold Hollow, and Green Mountain ranges, and are considered "some of the most scenic trails in all of Vermont."

There are also downhill skiing trails within the Study area. Taking the tram to the top of the Jay Peak Resort, in the Study Town of Jay, affords amazing views both the Franklin and Orleans reaches of the Missisquoi River. Jay Peak Resort is one of the largest ski resorts in Vermont, and a year-round destination for recreation including skiing, ice skating, golfing, and enjoying their water park. The Resort is a popular destination for winter activities and has full service lodging and has areas for

downhill skiing and snowboarding as well as Nordic skiing and snowshoeing. More information on the resort and their efforts to expand and become a four -season resort may be found on their website.

Several outstanding trail systems exist in the Study area including the Missisquoi Valley Rail Trail, the Catamount Trail, the Long Trail, and the Northern Forest Canoe Trail (discussed in the paddling section below). The Missisquoi Valley Rail Trail (MVRT) follows the old railroad bed of the train that used to run between Richford and St. Albans. Miles 16-26.4 of this popular rail trail follow the Missisquoi River from Richford all the way to Enosburg Falls. The trail travels by farms, fields, forests and wetlands with gentle grades and sweeping bends. The trail is currently a 10-foot wide bed of crushed limestone, and is closed to all motorized vehicles - except for snowmobiles in winter. The trail is most commonly used for walking, running, biking, skiing and horseback riding. The Trail is owned and maintained by the Vermont Agency of Transportation (VTrans), and volunteers. There is a Northwest Vermont Rail Trail Council that advises the State on matters related to the use and maintenance of the trail. At Enosburg Falls, users of the rail trail may enjoy historical attractions related to the dairy industry in Vermont, and a waterfall still utilized for power production.

Enosburgh is the home of "June Dairy Days," a celebration of Vermont's agricultural heritage since 1956. The area below the falls is a popular fishing access point. Recently, at the behest of community members who were no longer able to access this popular fishing spot due to posted, restricted access, the Vermont River Conservancy helped conserve nine acres for the Enosburg Falls River Access Park. In April of 2012 the Town of Enosburgh's Selectboard voted to dedicate $10,000 from the Enosburgh Conservation Fund to help create this park indicating local support for projects which improve local, safe access to the river for recreation. This access will also provide a permanent Northern Forest Canoe Trail put-in/take-out and create a public park. Travelers of the rail trail on the way to Richford pass along the Northern Forest Canoe trail, and through the Missisquoi Valley with views of Jay Peak, the Boston Post Road Bridge which is listed on the National Register of Historic Places, and ample birding and photography opportunities. The rail trail ends in Richford, not far from the Canadian border. It is here that the Missisquoi re-enters the U.S. from Canada and continues its journey to Enosburg Falls and beyond.

There are off-pavement mountain biking opportunities in the Study area as well. The Grateful Treads, of Montgomery, VT, is the local mountain bike club chapter of the Vermont Mountain Bike Association. The club has nearly 100 members and works with landowners to maintain a trail network in the towns of Montgomery, Westfield and Jay, VT. A post-designation Wild and Scenic Committee could reach out to this and other mountain biking groups in the Study area to be sure that trails are constructed and maintained to prevent erosion and sedimentation of the Trout River and its tributaries.

The *Long Trail* is a 175-mile hiking trail that travels the entire length of Vermont and traverses the highest mountain peaks in the State. It was built by the Green Mountain Club between 1910 and 1930 and is the oldest long-distance hiking trail in the country. It follows the ridges of the Green Mountains from the Massachusetts State line to the Canadian border. The Long Trail travels through the Study towns of Jay, Lowell, Montgomery, and Westfield. This section of the Long Trail, called the "Northern Frontier," is some of its most remote, and includes Jay Peak, Vermont's 8th highest mountain. At numerous places there are vistas of the river valleys below. More information about this section of the Long Trail may be found on the Green Mountain Club's website. The Long Trail was listed as one of the top five hiking trails in the nation by Backpacker Magazine in 2000, and is currently listed as one of their "Best Hikes Ever."[9]

Many snowmobile trails exist in both Franklin and Orleans Counties, and are maintained by VAST. The Vermont Association of Snow Travelers (VAST) is one

of the oldest snowmobiling organizations in the United States, and responsible for the organization, maintaining and grooming of snowmobile trails. As most trails are on private lands, local clubs obtain landowner permission for trails on private property. All riders in Vermont must belong to VAST and a local club to ride legally in the State. VAST encourages riders to respect the land by showing courtesy and not littering to ensure that Vermont's trail system remains open for years to come. From many local snowmobile trails riders may enjoy the Missisquoi River, its tributaries, and the wildlife they support.

Motorized recreational trails, including snowmobile and ATV trails, are important recreational resources in the Study area. The existing upper Missisquoi and Trout River crossings have been documented by the Study Committee. River crossings are often helpful for trail connectivity and accessing services. Potential future crossings may be wanted or needed, and are expected to be reviewed primarily through existing permitting authorities. As with other types of crossings, any Wild and Scenic River review by the Advisory Committee and/or National Park Service is expected to occur concurrent with other authorities and be focused on avoiding adverse impacts to free-flowing river conditions or other documented Outstandingly Remarkable Values.

No additional federal permits will be required for snowmobile crossings due to designation, the regular review process will continue to occur for permitting such crossings. If crossings are on private lands with no federal funding or permitting, Section 7 review is not triggered (see Chapter III for more information on these reviews). There must be a federal assisting agency (federal permit or federal funding) and the project must be a water resource development project (for a bridge, there must be construction within the bed and banks of the river or adjacent wetlands that triggers Army Corps jurisdiction) to trigger Section 7 review. If these conditions are met, there would be an Army Corps permit, and NPS Section 7 review (with input from the Advisory Committee) would occur under normal Corps permitting timeframes and procedures. Thus, not all bridges would trigger Section 7 review by NPS.

Hunting

The Vermont State Natural Heritage Information Project (NHIP) has mapped deer winter habitat in several portions of the Study area watersheds, most notably along the Trout River in the Town of Montgomery, as well as along the Missisquoi in Richford and Enosburgh. Deer Wintering Areas are defined by NHIP as "areas of mature or maturing softwood cover, with aspects tending towards the south, southeast, southwest, or even westerly and easterly facing slopes." These areas are vital to the winter survival of deer populations, and therefore important to hunting and recreational wildlife viewing in Northern Vermont. Deer, moose, black

Figure 16. Whitetail deer along the Missisquoi River. *Photo by Ray Giroux*

Figure 17. A river otter peeks out from the snow on the Missisquoi River in Westfield. *Photo courtesy of the Benedictine Monastery of Westfield, VT*.

bear, and turkey hunting are popular in the Study area. According to the Vermont Fish and Wildlife Department over 200,000 Vermont residents fish, hunt or watch wildlife, and millions of dollars are spent on these forms of recreation in VT each year. More information about deer wintering areas may be found in the Natural Resource ORV chapter.

Wildlife Viewing

The Study rivers have many natural features that draw people to the area for a variety of recreational activities. The unique geological history of the area offers many scenic possibilities for everyone from amateur geology buffs to scientific researchers. Many people are drawn to these areas simply for their natural beauty, and come to see or photograph the numerous waterfalls, rapids and gorges that are located along the rivers throughout the Study area (please see the Natural Resources ORV chapter for a more thorough discussion of Natural Resource and Geology ORVs).

Wildlife Viewing is an extremely popular activity for outdoor enthusiasts. The Outdoor Industry Association, in their 2006 Study on the economic impact of outdoor activities in the United States, estimated that 282,000 Vermonters (an impressive 54% of the population) are engaged in wildlife viewing and bird watching. That makes wildlife viewing the single most popular outdoor activity in the State, with trail hiking in second place with 33% of the population participating.[10]

The Upper Missisquoi and Trout Rivers Wild and Scenic Study area offers an abundance of bird and wildlife viewing opportunities. The river corridors provide habitat for a number of bird, mammal, reptile and amphibian species. Many significant ecological areas nearby offer waterfowl and associated wildlife viewing, such as Woodard Swamp (Enosburgh), Tamarack Brook Flats (Troy) and McAllister Pond Marsh (Lowell). Vernal pools, plentiful throughout the area, provide habitat for animals such as wood frogs and spotted salamanders that are found in no other habitat type. Deer wintering areas (discussed above) provide the critical habitat necessary for deer to survive the winter months and persist in an area. Perhaps most significantly, the Green Mountains that pass through the middle of the Study area represent an important non-fragmented habitat corridor for bear, bobcat, moose and deer (see the Natural Resources section of this Management Plan and the Staying Connected website for more information about wildlife corridors). Further, the Vermont Audubon Society has identified several Important Bird Areas (IBAs) along this habitat corridor for Bicknell's Thrush and the Peregrine Falcon, which are both identified as Species of Greatest Conservation Need in Vermont.[11]

All of these important wildlife habitats offer exceptional viewing and photographing opportunities within and nearby the Missisquoi and Trout Rivers.

Lists of Scenic and Recreational ORVs:

Swimming Holes

- Black Falls Brook Swimming Holes, Black Falls Brook, Montgomery
- Gibou Bridge Swimming Holes, S. Branch Trout River, above & below Gibou Rd., Montgomery
- Gray Rocks Swimming Hole, Trout River, Montgomery
- Hippie Hole or Crystal Falls, West Hill Brook, near Creamery Covered Bridge, Montgomery

- Hutchins & Hectorville Bridges Swimming Hole, S. Branch Trout River, Montgomery
- Longley Bridge Swimming Hole, Trout River, near Longley Bridge, Montgomery
- Montgomery School House Swimming Hole, Trout River, N of Montgomery Center, Montgomery
- Three Holes Swimming Area, Trout River, Montgomery (Note: this area is currently posted as private property, please do not trespass)
- Tillotson Mill, Lockwood Brook, Lowell
- Twin Falls Swimming Hole, East Branch Missisquoi River, Lowell
- Bakers Falls, Missisquoi River, Troy
- Big Falls, Missisquoi River, Troy
- Troy Four Corners Swimming Hole, Jay Branch, East of Rt. 101, Troy
- Snider Brook Swimming Holes, Snider Brook, Westfield
- Taft Brook Falls Swimming Holes, Taft Brook, Westfield (Note: posted as private property, please do not trespass - perhaps better labeled as a historic mill site)

Covered Bridges

- Comstock Bridge, Comstock Bridge Rd., Montgomery
- Fuller Bridge, Fuller Bridge Rd., Montgomery
- Hectorville Bridge, Gibou Rd., Montgomery (currently in off-site storage awaiting repair)
- Hutchins Bridge, Hutchins Bridge Rd., Montgomery
- Longley Bridge, Longely Bridge Rd., Montgomery
- West Hill (Creamery) Bridge, Creamery Bridge Rd., Montgomery
- Hopkins Bridge, Hopkins Bridge Rd., Enosburgh (near border with Montgomery)
- River Road Bridge, River Rd., Troy

Paddling Opportunities

- Numerous access sites (approximately 25) along both Missisquoi and Trout Rivers in Study area; however, only 5 are official access points through the Northern Forest Canoe Trail (3 in Richford and 2 in Enosburgh)
- Northern Forest Canoe Trail facilities: five established access points, six campsites and two informational kiosks

- Whitewater paddling opportunities
  - ◊ Missisquoi River – Troy to North Troy
  - ◊ Trout River – upstream of VT Route 118
  - ◊ West Hill Creek – from bridge near cemetery to VT Route 118
  - ◊ South Branch Trout River – from Hutchins Bridge to Trout River
  - ◊ Jay Branch – from golf course at Jay Peak to Missisquoi River
  - ◊ Black Falls Brook – last 2 miles into Montgomery village to Fuller Bridge
  - ◊ Wade Brook – near Westfield/Montgomery Town line

Waterfalls

- Hutchins Bridge Cascades, S. Branch Trout River, Montgomery
- West Hill Brook Falls, West Hill Brook, Montgomery
- Jay Branch Falls, Jay Branch, Jay
- Jay Branch Gorge, Jay Branch, Jay
- Tillotson Mill, Lockwood Brook, Lowell
- Twin Falls, E. Branch Missisquoi River, Lowell Village, Lowell
- Baker's Falls, River Rd., Troy
- Big Falls, Big Falls State Park, River Rd., Troy
- Taft Brook Falls, Taft Brook, Westfield

Geological Features

- Ayers Hill, Ayers Hill Rd, Berkshire
- Berkshire Copper Mine, Near North Rd., Berkshire
- Berkshire Kettle Hole, (from Berkshire Town Plan), Berkshire
- Richford Mineral Area, Lucas Creek, Richford
- Jay Branch Falls, Jay Branch, Jay
- Jay Branch Gorge, Jay Branch, Jay
- Tillotson Mill, Lockwood Brook, Lowell
- Big Falls, Big Falls State Park, Troy
- Baker's Falls, Upper Missisquoi near Windy Ln., Troy
- Troy Gorges, Troy

Figure 18. Paddling on the Missisquoi, just above Enosburg Falls. The Historic Bridge #12 (Boston Post Rd.) is in the background. *Photo by Shana Stewart Deeds*.

Established Trail Systems in Study Area

- Long Trail (hiking)
- Missisquoi Valley Rail Trail (multi-use)
- Northern Forest Canoe Trail (paddling)

Other Recreational/Tourism Opportunities

- Jay Peak Area Geotourism program – a joint venture between the Northeast Kingdom and the National Geographic Center for Sustainable Destination that's goal is to "incorporate the concept of sustainable tourism - a commitment to enhance local economies while minimizing the negative impacts on the environment and local culture."[12]
- Abundant wildlife viewing and bird watching opportunities along river and in upland areas of Study area
- Plentiful sport fishing opportunities – there are many populations of brown and rainbow trout in the Study area, as well as numerous native brook trout populations
- Hunting for deer, bear, ducks, moose, geese and other game animals
- Annual "June Dairy Days" dairy festival in Enosburg Falls
- Jay Peak Mountain Resort – skiing, golf, year-round outdoor and indoor activities
- Maple sugaring heritage and operations
- Montgomery Adventures: Guide services for Dog Sledding and River Tours
- Hazen's Notch Association: A year-round recreational possibilities, a renowned destination for Nordic (cross-country) skiing and snowshoeing
- Numerous private and state- and town-owned campgrounds, parks, state and town forests along river corridors in Study area. Campgrounds along the Study rivers include Hazen's Notch Campground in Lowell, and Barrewood and Mill Brook Campgrounds, in Westfield. Other campgrounds in the Study area include Lake Carmi State Park in Enosburg Falls, and Brookside Campground in Enosburg Falls
- Catamount Trail (skiing)
- Mountain Biking (various – info available from Grateful Treads Mountain Biking Club)
- VAST Trails (snowmobile)

IV.b.ii.2. Protection Goal for Scenic and Recreational Resources

To protect, preserve and enhance the abundant scenic and recreational opportunities in the area that relate to the river and its enjoyment by the public. To support the maintenance of adequate access opportunities to the river that allow for appropriate river uses while protecting the water quality, integrity of the riparian areas, and the surrounding environment of the river.

IV.b.ii.3. Scenic and Recreational ORV Management

Established Use

A 1996 survey by the Vermont Department of Fish and Wildlife revealed that 242,000 Vermont residents 16 years and older engaged in fishing, hunting, or wildlife-watching activities. In the same year, both resident and nonresidents spent $341 million on wildlife-associated recreation in Vermont.[13]

On the Missisquoi Valley Rail Trail, it is common to pass about a dozen folks during one's use. Cynthia Scott reports between 138-284 users/six months during her two hour review of the trail. Bethany Remmers, of the NRPC, reports about 209 people counted in Enosburg Falls, and 345 people from Enosburgh to Richford in a one month period. This comes out to about 1-6 users per hour.

Walter Opuszynski, from the Northern Forest Canoe Trail, reports feedback collected at the Richford NFCT Sign-in Box from May 20th and June 2nd, 2012. During this 14 day period 21 people used the trail in 17 kayaks and canoes. The majority of trips (3) were from Davis Park in Richford, VT to Dick and Pam's Store in East Berkshire, VT. One trip was listed from Davis Park in Richford, VT to Plattsburgh, NY, and another began in Plattsburgh, NY and ended at Richford, VT. This Davis Park kiosk recorded 30 users from 7/27-9/3/11 and 26 users from the same period in 2012. From 5/20-10/22/12 149 users signed in at this kiosk.

The Missisquoi National Wildlife Refuge, below the Study area, has not completed use counts since 2008.

There are no VT Agency of Natural Resources or VT Fish and Wildlife boat greeters in our Study area.

Despite the continued use of the recreational facilities in the Study area, it does not seem that user capacity in this area has been reached. One may still find quiet fishing, swimming and paddling spots along the river. Since there is no expectation of solitude, no one has reported to our Committee feelings of overcrowding at recreational sites. On prime swimming days, there may be crowds at swimming holes; however, as long as people are respectfully using the resource (removing trash, avoiding excessive alcohol use, avoiding fires outside of fire pits…) there seems to be no issue.

IV.b.ii.3.a. Threats to Scenic and Recreational ORVs:

- Public access – increasing loss of access due to increased posting and concern over landowner liability
- Policing and cleanup of access points falls on local landowners and volunteers
- Declines in wildlife habitat and natural resources (reduced water quality or aquatic organism passage, increased habitat loss and fragmentation) which reduces wildlife viewing opportunities
- Deterioration of covered bridges
- Reduced funding for maintenance and repair of covered bridges and established trails (MVRT, NFCT, Catamount Trail, Long Trail)
- Increased inputs of bacteria, particulates and other non-point source pollution
- Overuse of recreational resources does not seem to be a problem at this time, but should be monitored for issues associated with increased use of resources to avoid recreational overuse (such as rock collecting, litter, and erosion at official and unofficial access points)

Table 1. Many ORVs in the Scenic and Recreational category are covered by a variety of federal, state and/or local protections– not just the protections discussed in this chapter and the Appendices. This table contains a listing of Scenic and Recreational ORVs and the protection categories that pertain to each.

Scenic & Recreational ORV	Protection Categories				
	Water Quality	Historical	Geological Features and Natural Areas	RTE Species and Communities	Recreation
Swimming Holes	X		X		X
Covered Bridges		X			X
Trail Systems			X		X
Waterfalls			X		X
Geological Features			X		X
Paddling	X				X
Fishing	X		X	X	X
Hunting			X		X
Camping	X		X		X
Wildlife Viewing			X	X	X

- Increase of terrestrial and aquatic invasive species

III.b.ii.3.b. Current Protections for Scenic and Recreational ORVs:

Note: This list is not exhaustive. We have sought to list the most relevant protections for these scenic and recreational resources below. Please see the Protections section of this Management Plan for further discussion of protections within the Study area.

Federal Protections

Inclusion on the National Register of Historic Places is the greatest federal protection currently available to recreational ORVs. There are currently no federally-maintained parks or lands in the Study area towns which would afford protection of lands at a federal level.

State Protections

The primary State organization in charge of managing recreational opportunities for Vermont is the Department of Forests, Parks and Recreation (DFPR). This Department is responsible for the conservation and management of Vermont's forest resources, the operation and maintenance of the State Park system, and the promotion and support of outdoor recreation for Vermonters and visitors.

The Vermont Fish and Wildlife department is purposed with "the conservation of fish, wildlife and plants and their habitats for the people of Vermont." Wildlife Management Areas (WMAs) are lands managed by the Department of Fish and Wildlife to emphasize the conservation of fish, wildlife and their habitat, and to provide people with opportunities to enjoy these resources. All WMAs are open to hunting, trapping, fishing, wildlife viewing and other related outdoor activities.

State Ownership

There is one WMA in the Study area – Avery's Gore WMA,[14] in Montgomery. There are three other State properties in the Study area, but only Big Falls Natural Area and State Park is along the Missisquoi River (16 acres, in Troy)

Table 2. Summary of Scenic and Recreational protections in local town planning and zoning in the upper Missisquoi and Trout River Wild & Scenic Study area towns (please see Appendix 3 or the original town documents for more detail).

Town	Study River(s) Mentioned in Town Plan as a Recreational Resource? *(with relevant language from the Town Plans)*	Recreational protections in Zoning By-Laws? *(with relevant sections of By-Laws)*
Berkshire	**Yes** The Plan intends that "streams, rivers, ponds, and wetlands should be maintained in their natural state… Local regulations should provide buffer areas to maintain the environmental, recreational, and scenic value of water courses, water bodies, and shorelines" (pg. 49) and "New development should be designed to ensure continued public access to outdoor recreational opportunities in the Town." (pg. 76).	**No** Berkshire's zoning bylaws do not create districts solely for purposes of conservation of recreational opportunities, but recreation is stated to be an important component of land use decision making (Section 9.5).
Enosburg Falls	**Yes** The importance of recreation is included in many portions of the Enosburg Falls Village Plan. Most statements regarding recreational opportunities relate directly to the Missisquoi River.	**Yes** Town has a Recreation District (Section 2.3); Recreation is also cited in Chapter 4 (Economy), and Chapter 11 (Natural Resources).
Enosburgh	**Yes** The Town Plan of Enosburgh emphasizes the importance of the Town's natural areas for their environmental, ecological, scenic, educational, and recreational uses - especially concerning the Missisquoi River.	**Yes** Town has two districts that intend to protect recreational opportunities, among other considerations: The Conservation District (Section 560) and a Natural Resources Overlay (Section 570).
Montgomery	**Yes** The Town plans to protect its waterways from adjacent development that may adversely impact recreational activities on the Trout River.	**No** *(As this W&S Management Plan is being written, Montgomery is beginning the process of revising their Town Plan.)*
Richford	**Yes** The Richford Town Plan includes a discussion about the Missisquoi River as an important resource for recreation in the Town.	**Yes** Richford has two zoning districts that contain recreational purposes in their bylaws: The Recreation/Conservation District and the Forest/ Conservation District.

Table 2. *Cont.*

Town	Study River(s) Mentioned in Town Plan as a Recreational Resource? *(with relevant language from the Town Plans)*	Recreational protections in Zoning By-Laws? *(with relevant sections of By-Laws)*
Jay	**No** The Town of Jay supports the designation, acquisition, preservation and planning for development of recreational areas of the Town but does not specifically mention the Study rivers.	**Yes** The Town has two zoning districts with the intent of facilitating recreation: the Recreation District (Section 305) and the Conservation-Recreation District (Section 307).
Lowell	**Yes** The Lowell Town Plan recognizes the wealth of outdoor recreational opportunities in the Town, and that it is necessary to maintain and protect Lowell's natural resources.	**No**
Troy	**Yes** Recreation is included in the central objectives of the Troy Town Plan; among these goals is a statement regarding planning for and protecting the quality of water resources (pg. 35).	**Yes** Section 321 includes the encouragement of "a more efficient use of land… to preserve open space, natural resources and recreational areas" (pg. 24).
Westfield	**Yes** A central goal of the Westfield Town Plan, regarding recreation, is to help maintain local access to farm and forestland for snowmobiling, hunting, fishing, skiing and hiking.	**Yes** The Town has established a Recreation-Residential District, for the development of both residential and recreational land uses while maintaining the rural character of the Town.

Vermont's Land Use Planning Law (24 V.S.A. 117)

Statutory goal #7 of this law is to "maintain and enhance recreational opportunities for Vermont residents and visitors" which directly supports the goal of recreational access within the Study area. This statutes also states that "Growth should not significantly diminish the value and availability of outdoor recreational activities", and "Public access to noncommercial outdoor recreational opportunities, such as lakes and hiking trails, should be identified, provided, and protected wherever appropriate" (24 V.S.A. § 4302).

Vermont's Landowner Liability Law (12 V.S.A. 5793)

Land which is not posted in Vermont is open for public use. This law protects the landowner from liability lawsuits by people using their land for recreation unless the landowner intentionally puts recreational users in harm's way. The law states that "an owner shall not be liable for property damage or personal injury sustained by a person who, without consideration, enters or goes upon the owner's land for a recreational use unless the damage or injury is the result of the willful or wanton misconduct of the owner." This law helps meet the goal of this Management Plan to maintain and increase

recreational opportunities and access to the Missisquoi and Trout River.

Act 250

Act 250 is Vermont's development control law. Environmental criterion number 10 of Act states that to obtain a permit, an applicant must demonstrate that a project is "…in conformance with any duly adopted local or regional plan or capital program under [24 V.S.A Chapter 117]." Any Act 250 project in conflict with the town plan would be in violation of Criterion 10.[15]

Criterion 8 of Act 250 seeks to determine if a project will have an undue, adverse effect upon the scenic or natural beauty of an area, or (8A) on wildlife habitat or endangered species in the area. If it's determined that a project has adverse impacts, an assessment occurs to determine whether or not a project's impacts are "undue;" if so, the project can be denied an Act 250 permit or have conditions attached which alter the project and mitigate the aesthetic impacts. For more information on Act 250, please see the Act 250 chapter in Appendix 9, or contact your local District Coordinator.

State Recreation Plan (non-regulatory)

The Vermont Outdoor Recreation Plan, also referred to as the SCORP (Statewide Comprehensive Outdoor Recreation Plan) is currently being revised, and is meant to provide resources for towns and organizations to support outdoor recreation in the State. In this revision, water trails will be added to the document and the Northern Forest Canoe Trail will be highlighted.

This Plan shows that studies undertaken by the State in 1992 and 2002 demonstrate "the importance of scenery to the people of Vermont." The NVDA recognizes that "Issues that were identified as important by…remain important for the region a decade later. These issues include: degraded water quality and an increase in aquatic nuisances, overdevelopment of shorelines around lakes and ponds, destruction of fish and wildlife habitat, loss of scenic resources and rural character, increasingly limited access to private lands (posting), and a lack of respect for private lands. Respondents also felt there is a need for greater numbers of trails, paths, and greenways in the region..."[16] These plans were used to create the Opportunities for Action for these resources, and a summary may be found in the Protections chapters and in Appendix 19.

> ***Vermont offers outstanding opportunities for outdoor recreation, which support the State's economy and the well-being of its visitors, people, and communities. Vermont is kept well-connected to nature through thoughtful, careful use and enjoyment of its natural and cultural resources.***
>
> —From the 2005-2009 Vermont Outdoor Recreation Plan

Assisted by public input, the Vermont Department of Fish and Wildlife developed a Strategic Plan to help direct its activities. The primary departmental goals in the plan include managing wildlife and fisheries habitat. Another goal of the plan is to support safe and sustainable recreational activities, namely fishing, hunting and wildlife viewing. The entire plan can be viewed online.[17]

Regional Plans (non-regulatory)

The Northwest Regional Planning Commission's (NRPC) Regional Plan for 2007-2012 contains directives (policy 3.20) that support the use of surface waters for a variety of appropriate recreational uses.[18] The Plan goes on to say that a water supply goal (4.3) is to "insure that water systems are not contaminated, depleted or degraded, that drinking water sources do not contain harmful contaminants and that there is sufficient quantity of water available for existing and anticipated recreational, residential, commercial and industrial needs." A summary of recreational goals from NRPC's regional plan is presented in the Scenic and Recreational Protections Appendix 3.

According to the Northeastern Vermont Development Association's (NVDA) Regional Plan the goal of providing sufficient quantities of water to meet existing and future residential, agricultural, commercial, industrial and recreational needs should be maintained. A strategy in the Plan for the protection of natural resources encourages the maintenance and improvement of recreational opportunities as a means for natural resources stewardship. It supports the increase of ecotourism in the Northeast Kingdom if it is done in a way that minimizes the disturbance and impact to the region's natural resources. This Regional Plan recognizes that recreation is an important part of the economy in our Study area, and stresses the importance of balancing a "healthy and scenic" environment with the need for a healthy economy. A summary of recreational goals from NVDA's regional plan is presented in the Scenic and Recreational Protections Appendix 3.

A post-designation Advisory Committee could work with the Regional Planning Commissions to, as NVDA recommends, "support the protection and the acquisition of unique and irreplaceable recreational spaces open for the public to enjoy."[19]

Town Protections

All of the study town plans contain language about the value of recreational opportunities in the town, and the importance of supporting efforts to maintain and enhance those opportunities where possible. All towns except for Lowell and Montgomery have included ordinances related to recreational opportunities in their zoning bylaws (Table 2).

IV.b.ii.3.c. Gaps in Protections for Scenic and Recreational ORVs:

- **General:** Almost all land in the Study area is in private ownership; features of the landscape, including areas popular for recreational use, are not on lands with government protections, such as town forests, state parks or national parks, or parcels with conservation easements.

Figure 19. Paddling by through a gorge of exposed bedrock on the Missisquoi River in Westfield. *Photo by Ave Leslie.*

- **Swimming Holes:** Lack of programs in place to deal with the "overuse" issue of swimming holes and other river areas that attract visitors. Coordinated maintenance of access, litter removal and education could help preserve resources for future generations of use and enjoyment.

- **Covered Bridges:** Protected from development projects only if funding for project is from a federal source

- **Paddling and Fishing:** Access issues; access on private land is nor guaranteed, and may potentially be unsafe if along roads. Coordinated maintenance of access, litter removal and education could help preserve access to these resources for future generations to use and enjoy.

- **Water Quality:** Richford, Lowell, Troy and North Troy have no development setback requirement at the town level for waterway protection. The addition of this provision in these towns would enhance the fish habitat, as well as the water quality of rivers and streams throughout the Study area and downstream.

- **Waterfalls:** Most features are on private lands, with the exception of Big Falls State Park.

- **Geological Features:** With the exception of Big Falls, most features are on private lands.

- **Trail Systems:** Lack of funding for continued maintenance in perpetuity, liability issues.

- **Hunting:** Unless declared in a town plan, deer wintering areas currently do not have legal protection in Vermont. Although Westfield, Montgomery, Enosburgh, Richford and Berkshire mention the importance of these areas in their respective town plans, none of the Study area town plans have explicit management goals regarding the protection of deer wintering areas. Deer wintering habitat overlaps with the Wild and Scenic Study area most notably along the Trout River in Montgomery, and the Missisquoi in Richford and Enosburgh. Montgomery and Enosburgh have town-level restrictions on development along waterways, which will help to preserve deer habitat in these areas. Richford does not have waterway setback requirements. Additionally, Any increase in posting of private property would restrict recreational use.

- **Camping:** Lake Carmi is the only State Park campground in the Study area. Commercial campgrounds are privately run, and dependent upon the quality of riverine environment.

- **Wildlife Viewing and Photography: A**ccess on private land is not guaranteed, and may potentially be unsafe if along roads. Coordinated maintenance, litter removal and education could help preserve access to these resources for future generations to use and enjoy.

  Any reduction of farm lands for development reduces the opportunity for photographing a rural working landscape and preserving local food production.

- **Town Gaps:** Lowell and Montgomery do not have ordinances related to recreational opportunities in their zoning bylaws.

IV.b.ii.3.d. Opportunities for Action/Management Recommendations - Scenic and Recreational ORVs:

Education and Outreach

≈ Seek to develop relationships with landowners so that issues surrounding recreational opportunities may be identified and addressed

≈ Help educate landowners on the liability protections afforded by State law for unposted lands

≈ Work with local groups to educate landowners and recreational boaters to reduce the spread, control existing, identify threats, and monitor the Study area for non-native invasive species. One example in the Study area is the Montgomery Conservation Commission's work on controlling Japanese knotweed along the Trout River

≈ Work with VTrans and VT ANR to educate the community on appropriate road and stream crossings which allow for aquatic community passage and reduced flood hazards

Local Planning

≈ Encourage Lowell and Montgomery to include ordinances related to recreational opportunities in their zoning bylaws

≈ Work with the Regional Planning Commissions to help share local, state and federal funds (perhaps helping to leverage funds from the federal government's American Great Outdoors program and the National Park Service's Rivers, Trails and Conservation Assistance program)

≈ Work with the Regional Planning Commissions to create a network of feedback and maps for recreational users (along with an ingoing survey of

use numbers) so that recreational opportunities may be coordinated throughout the Study area that best meet user needs – perhaps there might be a formation of a Recreational Working Group for the region as none of the towns have recreation committees

≈ Work with the Regional Planning Commissions to enhance nature-based recreational activities in the region while also working to increase sustainable access points so increased traffic doesn't strain already limited access areas

≈ Help map official access points where landowners are amenable to doing so

≈ Work with towns who wish to increase recreational ecotourism in the area, ideas include a tour of covered bridges in conjunction with revitalizing the Hectorville Covered Bridge in Montgomery, and establishing a Wild and Scenic Rivers Boating Trail akin to that established by the Sudbury, Assabet and Concord Wild and Scenic River Stewardship Council.

≈ Support and partner with local organizations (such as the Northern Forest Canoe Trail, Hazen's Notch Association, Trout Unlimited, Missisquoi Valley Rail Trail Association, local conservation organizations and historical societies) on vibrant recreational opportunities in the Missisquoi and Trout Watershed which are compatible with river water quality and protection

≈ Work with local partners to reestablish a healthy native trout population for recreational fishing

≈ Work with efforts which came out of the VT Recreational Plan including rewarding landowners for providing recre-ational use of their land, and encouraging the legislature to give tax breaks and continue to reduce liability to landowners who allow recreation on their lands

Volunteer Opportunities

≈ Partner with local organizations to negotiate agreements with willing landowners to establish and maintain official access points

≈ Assist with the upkeep of river access points by continuing river cleanups and other stewardship opportunities – perhaps by developing an Adopt-a-Pool access program for swimming holes (and fishing/boating access) and seeking donated trash collection services

Work with Private Landowners

≈ Help local farmers to maintain the recreational access points required by conservation programs, such as farmland easements or CREP programs, on their lands

Figure 20. A flock of Canada Geese on the Missisquoi River in Autumn. *Photo by Ann Hull.*

Endnotes

[1]Northeastern Vermont Development Association's (NVDA) Regional Plan [Caledonia, Essex, and Orleans Counties] as adopted by the NVDA June 29, 2006 (nvda.net/TopNavBars/regionalplan.html); pg. 17

[2]Allen, Mel. (2010, May/June). The Gift of the Glaciers: Summer swimming holes of New England. Retrieved May 6, 2010, from www.yankeemagazine.com/blogs/newengland/ne-swimming-gift

[3]Huntingdon Graphics, Shelburne, VT. 1st Edition June 2012.

[4]The Northern Forest Canoe Trail: www.northernforestcanoetrail.org/

[5]www.outsideonline.com/adventure-travel/north-america/canada/quebec/Best-Canoe-Trail.html

[6]www.vtfishandwildlife.com/fish_accessareas.cfm

[7]www.bikenewengland.com/vermont.html

[8]www.yankeemagazine.com/topfive/topfivetravel/biketours/2

[9]www.backpacker.com/2010-november-best-hikes-long-trail-vermont/destinations/14933).

[10]Statistics from: www.outdoorindustry.org/pdf/VermontRecEconomy.pdf

[11]www.vtfishandwildlife.com/library/Reports_and_Documents/nongame_and_Natural_Heritage/species_lists/ Birds_of_Vermont.pdf

[12]www.travelthekingdom.com/index.php)

[13]Northeastern Vermont Development Association's (NVDA) Regional Plan [Caledonia, Essex, and Orleans Counties] as adopted by the NVDA June 29, 2006 (nvda.net/TopNavBars/regionalplan.html); (pg. 100).

[14]Avery's Gore WMA: www.vtfishandwildlife.com/library/maps/Wildlife%20Management%20Areas/Essex%20District/Averys%20Gore%20WMA.pdf

[15]"Conserving Vermont's Natural Heritage" - a publication of the State of Vermont Department of Fish & Wildlife. Available online: www.vtfishandwildlife.com/library/maps/Community_Wildlife_Program/complete.pdf

[16]Northeastern Vermont Development Association's (NVDA) Regional Plan [Caledonia, Essex, and Orleans Counties] as adopted by the NVDA June 29, 2006 (nvda.net/TopNavBars/regionalplan.html); pg. 18

[17]VT Fish & Wildlife Strategic Management Plan: www.vtfishandwildlife.com/library/reports_and_documents/Fish_and_wildlife/Strategic_Plan.pdf

[18]The Northwest Regional Planning Commission's (NRPC) Regional Plan [Franklin and Grand Isle Counties] for 2007-2012 as adopted by the NRPC on August 29, 3007 (www.nrpcvt.com/Reports/RegionalPlan.pdf).

[19]Northeastern Vermont Development Association's (NVDA) Regional Plan [Caledonia, Essex, and Orleans Counties] as adopted by the NVDA June 29, 2006 (nvda.net/TopNavBars/regionalplan.html); pg. 13

Additional Resources:

- Act 250: www.anr.state.vt.us/dec/permit_hb/sheet47.pdf
- Catamount Trail: www.catamounttrail.org
- Deer wintering areas: www.vtfishandwildlife.com/cwp_elem_spec_dwa.cfm; also see page 85 of www.vtfishandwildlife.com/library/maps/Community_Wildlife_Program/complete.pdf
- Green Mountain Club: www.greenmountainclub.org
- Hazen's Notch Association: www.hazensnotch.org
- Jay Peak Resort: www.jaypeakresort.com
- Montgomery Adventures: www.montgomeryadventures.com
- Sudbury, Assabet and Concord Wild and Scenic River Stewardship Council: www.sudbury-assabet-concord.org
- The Missisquoi Valley Rail Trail: mvrailtrail.com/index.php
- The Staying Connected Initiative: www.stayingconnectedinitiative.org
- The Vermont Outdoor Recreation Plan: www.vtfpr.org/recreation/scorp/home.cfm
- Vermont Association of Snow Travelers (VAST): www.vtvast.org
- Vermont Department of Fish and Wildlife: www.vtfishandwildlife.com/index.cfm
- Vermont Department of Forests Parks and Recreation: www.vtfpr.org/index.cfm
- Vermont State Natural Heritage Information Project: www.vtfishandwildlife.com/wildlife_nongame.cfm

The Vermont Active Outdoor Recreation Economy:

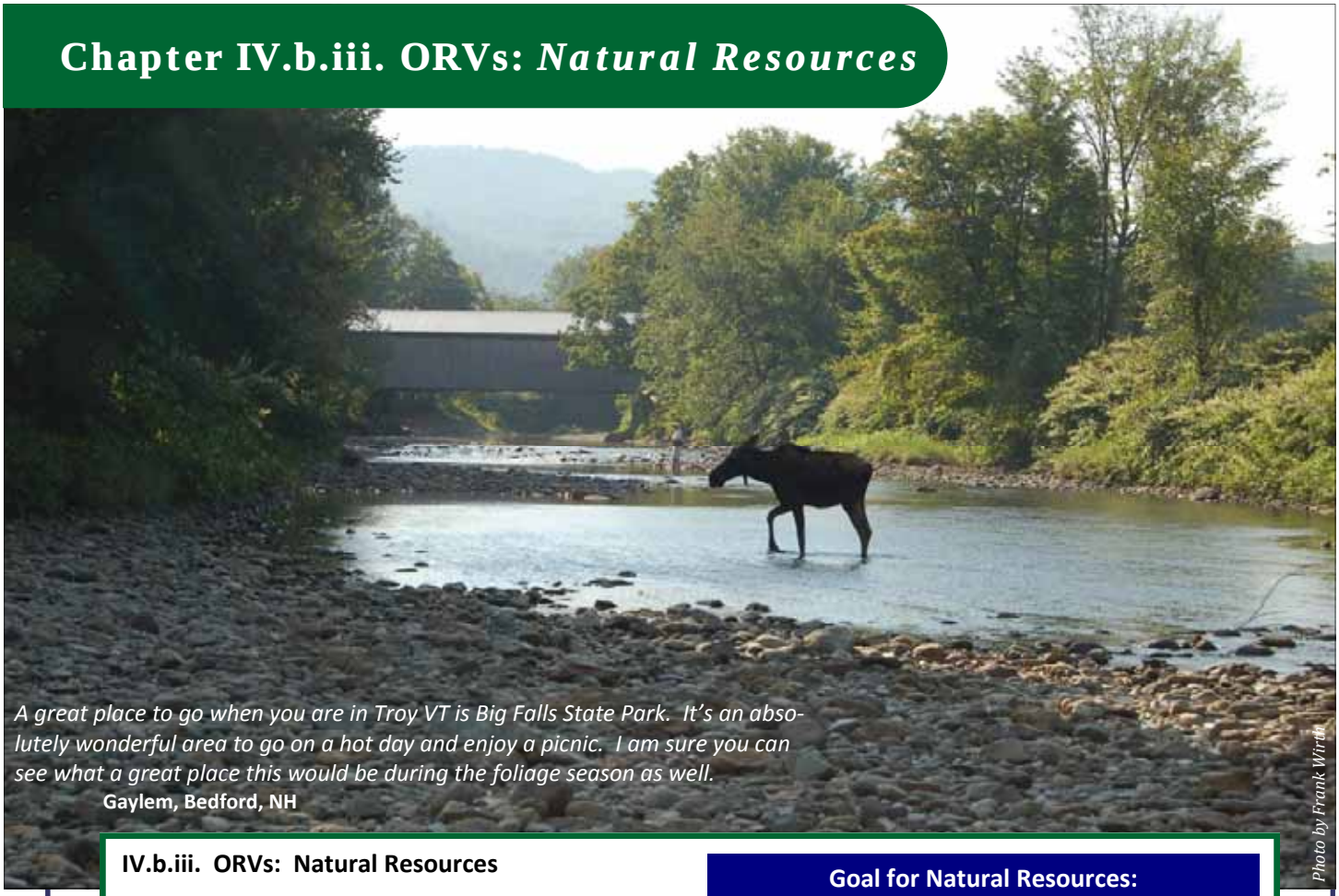
- *Supports 35,000 jobs across Vermont*
- *Generates $187 million in annual State tax revenue*
- *Produces $2.5 billion annually in retail sales and services across Vermont (accounting for 12% of gross State product)*

— www.outdoorindustry.org

Please see the Scenic and Recreational ORV fold out map at the end of this Management Plan.

Figure 21. Ice on the Missisquoi in Lowell. *Photo by Todd Lantery*

Chapter IV.b.iii. ORVs: *Natural Resources*



A great place to go when you are in Troy VT is Big Falls State Park. It's an absolutely wonderful area to go on a hot day and enjoy a picnic. I am sure you can see what a great place this would be during the foliage season as well.
Gaylem, Bedford, NH

Photo by Frank Wirth

IV.b.iii. ORVs: Natural Resources

IV.b.iii.1. Overview of Natural Resource ORVs:

Goal for Natural Resources:
To preserve the natural resources and unique natural features of the upper Missisquoi and Trout Rivers so that they may be enjoyed by current and future generations.

One need look no further than the Vermont Fish and Wildlife Department and Agency of Natural Resources' 2004 publication *Conserving Vermont's Natural Heritage* to see Vermont's commitment to preserving the abundant natural resources in the State. "It is no mystery why people enjoy living in and visiting Vermont. This state has what so many other once rural places have lost: a wealth of wildlife and scenic beauty, traditional working landscapes that support viable local economies, and desirable social and cultural attributes…"[1] This is an excellent resource to delve more deeply into a discussion of State-wide Natural Resources. Though all of these resources are interconnected, this Plan attempts to focus on those most associated with the Missisquoi and Trout Rivers: Geology; Rare, Threatened and Endangered Species and Natural Communities; Significant Ecological Areas, and Critical Wildlife Habitat. The chapter that follows explores the Outstanding and Remarkable Values (ORVs) in these natural resource categories. Water quality, also a natural resource, is discussed in its own ORV chapter.

Vermont Geology

The Wild and Scenic Study area borders the Champlain Valley, but is typically characterized as the foothill and the Green Mountain geologic regions. Historically, most of Vermont was farmed (around 80% of Vermont was cleared for farming); at this time only some of the highest peaks and wettest areas were not in agricultural use. Many hill farms and small homesteads existed in the region, and the geology directly impacted their success by giving rise to the

topography, soils and waterways of their farmsteads. Valleys tend to have better agricultural soils, thus the most persistent and successful farms tend to be near the waterways. This poses an opportunity for cooperative projects between farmers and watershed organizations for preservation of both the working landscape and water quality of our region.

The State of Vermont has a diverse geological history which is represented in the varied landscape seen today. The land that now constitutes Vermont has been at the edge of a continental plate throughout much of its history, which has subjected the area to the dynamic forces of colliding, pushing, thrusting, folding and wrinkling that happen through time at the edge of a great land mass. Much of Vermont was also historically underwater resulting in bedrock that mostly originated as sea sediments.

Continental movements are responsible for the mountain building events, or orogenies, that created mountains and shaped valleys in the Study area. The first of four of these major events that shaped the Study area, the Grenville Orogeny, occurred in the Precambrian era over one billion years ago. This event created the Adirondack Mountains and the southern portion of the Green Mountains. Following this orogeny, a great valley began to form as the continents pulled apart. This valley filled with salt water creating the ancient Iapetus Sea (during the lower Cambrian and early Ordovician time periods). Sediments from the margins and deeper water of

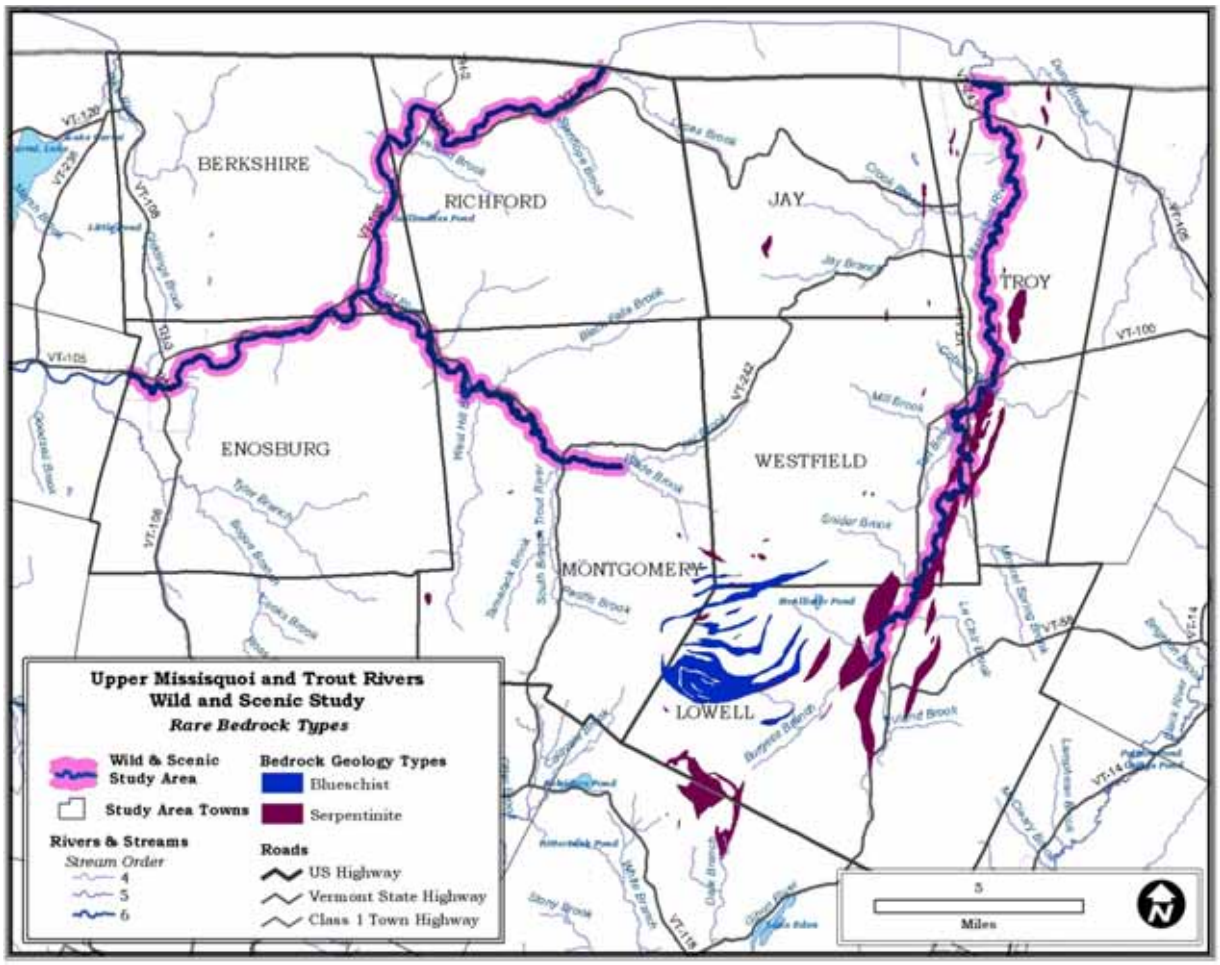


Figure 22. Map of the blueschists and serpentinite bedrock in the Study area, data from the 2011 Bedrock Geologic Map of Vermont.

this ocean were compacted and cemented, metamorphosed, and are found today as the shales, slates, phyllites and schists that currently make up much of the geology in the northern Green Mountains including that of the Study area. It was also during this time period that the building blocks of the various limestones, dolomites, shales, and quartzites of the Champlain Valley were deposited.[2,3]

Figure 23. Bedrock outcropping along the Missisquoi River in Westfield, VT.

The next mountain building event, the Taconic Orogeny, occurred around 460-450 million years ago as a volcanic arc collided with the continent of Laurentia. Sedimentary rocks deposited in the Iapetus Sea were metamorphosed and deformed during this collision. These rocks were pushed westward towards the continental margin as the Iapetus Sea closed; oceanic crust and mantle were also emplaced on the margin. Evidence of this is seen today in the serpentine outcrops, talc and asbestos deposits and other minerals that are in our Study area. The Serpentine Outcroppings in the Study area along the Missisquoi River in Lowell, Troy and Westfield represent a high concentration of these rocks in Vermont.[4] These outcroppings are part of one of the largest ultramafic serpentine zones in the country. This zone is part of the richest serpentine belt in the world, which stretches along the Appalachian Mountains from Newfoundland to Georgia. This serpentine belt includes the blueschists (very high pressure metamorphosed volcanic rocks) in the Tillotson Peak area, which are unique in Vermont and the Appalachian Belt. These rocks are described in field guides and attract geologists from all over the world (B. Doolan, personal communication, April 21, 2011).

These serpentine rocks are tied to the Missisquoi drainage basin, and the bedrock origin and rock types affect the path and movement of the

Focus on Contributing ORV: Serpentine Outcrops and Blueschists

According to Barry Doolan, Professor of Geology at the University of Vermont, the blueschists found within our Study area, such as those found at in the Tillotson Peak area, are "unique geologically and provide habitat for unique flora associated with this rock." Several rare, threatened or endangered plant species exist in these areas thriving on the soils formed by the unique chemical compositions of the mafic and ultramafic rocks found along this thrust fault. Doolan continues that these blueschist minerals in the mafic bedrock in our Study area are "unique to VT within the Appalachian belt." (According to Doolan, the metamorphic rocks in the Lowell area have been subjected to some of the strangest temperature and pressure conditions. They were at relatively low temperatures at a depth of 80-100km below the Earth's surface, and then were brought to the surface rapidly when the continental and oceanic crust came together.) These rocks are unique to the Appalachians, and the blueschists are one of only two examples where they may be seen at the surface. These rocks in the Tillotson Peak area, are described in field guides, and "geologists from all over the world visit this site because it is so unique." (More information on the nearby serpentine outcrops, especially the rare plant species which may be found there, can be found below. NOTE: The blueschist grade metamorphic rocks at Tillotsen Peak and Tillotsen Camp are not the serpentinites. The blueschists are metamorphosed volcanic rocks or mafic schists. If you look at the geological map you will see that the closest ultramafic, serpentinite, rock is roughly ½ mile from the Camp and Peak near the river.)

Figure 24. Photo taken by Long Trail Hiker Scott Jacobsmeyer at the Tillotson Camp.

Missisquoi River (see Focus on the ORVs below). Big Falls is a good example of the geologic history of the Study area because there one may see the many folds and deformities in the rocks. The Burgess Branch Fault is visible through the topography of the area, and has been studied by geologists at the Vermont Geologic Survey and the University of Vermont.

The third mountain building event, the Acadian Orogeny (about 360 million years ago) continued to change the Green Mountains by events which deformed, uplifted and metamorphosed the area's bedrock. It is estimated that these peaks were once 8,000 feet higher than they are today, but have been eroded away over millions of years by wind, water and glacial ice.[5] During this period, the green Vermont serpentine which is mined south of the Study area and often, inaccurately considered a marble, was metamorphosed (this rock was metamorphosed several times in the early Taconian through Acadian orogenies). The fourth orogeny, the Alleghenian, didn't play a large role in our Study area, but was very important nearby as this mountain forming event created portions of the Appalachians.

These schists are well documented in geologic literature; some of these resources may be found at the end of this chapter. The fact that these blueschists are at the surface here and exposed is rare. In order preserve this geological resource and keep it accessible to the community, please:

≈ Avoid trespassing on posted private property

≈ Avoid collecting any of the outcrop, or damaging it in any way

≈ Remove all trash, pack out what you bring in

Opportunities for Action: Serpentine Outcrops and Blueschists

The post-designation Wild and Scenic Advisory Committee could serve as a resource for communities, landowners and recreational users to ensure that these geologic resources are maintained through educational workshops about the resources, and outreach regarding their protection. The Committee could encourage some of the following actions:

≈ Trash collection, if you visit the site leave it better than when you arrived

≈ Attend educational workshops or hikes designed to inform community members about Vermont's geology, including the serpentine outcrops of the region

≈ Hike on the Long Trail to enjoy the geology of this region. There is a shelter nearby at Tillotson Camp as you ascend Tillotson Peak. The final section of the Long Trail (#12) runs from the Camp to Journey's End

Glacial History

During the most recent ice age (the Wisconsin Glaciation) about 17,000 years ago, Vermont and much of North America were covered by more than a mile of ice, known as the Laurentian Ice Sheet. The expansion subsequent receding of this ice sheet played a major part in shaping the current landscape and the character of local waterways.

According to Stephen Wright, Professor of Geology at the University of Vermont, evidence of glacial movement can be seen in the striations found on rocks in the Study area which indicate the direction of glacial travel – northwest to southeast. The glacial ice, and subsequently the meltwater, generally flowed in the direction of river valleys. Both the glaciers and meltwater carried large amounts of sediment and debris that was deposited across the region in a layer of surficial material called glacial till. Till is made up of the soil and bedrock material below the glacier, typically sand, gravel, and small rocks, along with any sediments picked up by the glacier along its path. The nutrients of the ensuing soil and the drainage of the land is affected by the composition of the deposited till. Till consists of a mix of material sizes and often called hardpan due to its high density which resulted from compaction from the weight of the glacier above. This glacial till comprises much of the present surficial geology of the Missisquoi and Trout River Study area.

The end of the Wisconsin glaciation was caused by a rapid warming. It took about 2,000 of years for the ice to melt and recede across the area that is now Vermont. As the glacier melted it created glacial Lake Vermont, which was much larger than the Lake Champlain that we see today. The glacier created an enormous ice dam on the northern end of the lake, which caused water to flow south to the Atlantic Ocean – the opposite direction of flow in today's Lake Champlain. About 13,000 years ago, once the glacier had left, the once-compressed land had time to expand and rise (called "isostatic rebound"). This slight change in elevation changed the direction of flow of what became Lake Champlain to northward. The valleys drained of lake water and began to resemble the rivers and streams we know today (see these maps and article for more information).

As glaciers moved and melted about 13,000 years ago, a freshwater lake filled the Champlain Valley and is known as Lake Vermont. The channel of the present-day Missisquoi River was at the bottom of this glacial lake; the Missisquoi arm of Lake Vermont extended to where Montgomery Center is today.[4]

To the east, a glacially enlarged Lake Memphremagog also extended south and west of its present boundary. There, the pro-glacial Lake Memphremagog deposited many of the fine textured silts and clays that are found in much of the lowlands of Troy, Westfield and parts of Lowell. The Missisquoi River today cuts through these fine sediment soils. Over the past 10,000 years the Missisquoi River and the lower reaches of the Trout River have crisscrossed their floodplains and reshuffled the sandy and silty soils of their valleys.

Many types of sediment were deposited in Lake Vermont when it covered our Study area, including many of the sands, silts and clays found there today. These surficial geologic deposits provide the foundation for the fertile farmland soils important to

Current Features Created by Glaciers

The Berkshire Kettle hole is a prime example of a landscape feature with a direct connection to glaciers. As a glacier moves through an area, large chunks of ice may break off, then become plowed under a layer of earth as the glacier travels past. Once the chunk of ice melts, a depression is left behind. This unique kind of depression is called a "kettle hole".

Meltwater rivers flowed on top of and under the glaciers creating eskers, winding deposits of glacial sediments. There are examples of eskers in Troy and North Troy. As these glacial rivers entered glacial lakes, great deltas of sand were created. These deltas, along with eskers, are often utilized now for sand and gravel extraction.

The numerous waterfalls in the study area are certainly unique features of the landscape. Larger waterfalls are often the result of glacial ice scouring the land and removing chunks of easily erodible materials. Big Falls is a particularly significant geological site. Outside of its scenic beauty, the exposure of such large amounts of bedrock has provided useful geologic data and led to a greater understanding of the geology in the area.

A note on the significance of the blueschists and serpentinite in the Study area

Margorie Gale, VT Geological Survey

Of significance is the fact that the outcrops at Tillotsen peak and Tillotsen Camp are metamorphosed mafic volcanic rocks and schist, not ultramafic rock or serpentinite. Figure 22 shows that Tillotsen Peak and Tillotsen Camp is all metamorphosed mafic volcanic rocks (blueschist and eclogite). However, you do see some ultramafic rock (serpentinite) nearby - the closest outcrops are roughly ½ mile from the Camp or Peak., especially along the Missisquoi River. Blueschist and eclogite (very high pressure metamorphic rocks) are exposed in metamorphic belts throughout the world – China, California, Australia, Canada/Yukon and more; however, they are not generally preserved or exposed in the Appalachians. They are evidence that the rocks were subducted to a great depth and then exhumed (brought back up) quickly. In conjunction with metamorphic age dates, these data helped define the timing for subduction in Vermont. The discovery by Jo Laird of blueschist in Vermont was really important for future explanations of VT's geologic history. In terms of "uniqueness", the blueschist in Vermont only occurs in the Tillotsen area, whereas serpentinite occurs sporadically within a belt or zone on the east flanks of the Green Mountains throughout the State.

the heritage and culture of Franklin and Orleans counties.

Soils

As mentioned above, the bedrock and glacial history Vermont shaped the current waterways and soils of the region. Prime soils for agricultural and forestry uses take thousands of years to develop, and are crucial to the economy of Franklin and Orleans counties. Page 3.3 of the Northwest Regional Planning Commission's (NRPC) Regional Plan for 2007-2012 shows a map of agriculture and forestry soils in the area. The Study towns contain many of these prime forest and agricultural soils, the development of which may be traced directly to the geologic history of the region. Development in the region is also affected by the area's soils due to the necessity for the land to perc in order to contain septic systems.

Glaciers Shaping the Waterways

Glacial Influence on Fish

Prior to the glacial cycles during the Pleistocene (2.6-11,700 years ago), what would become our present-day Missisquoi River cut through the fairly weather resistant bedrock of the Green Mountains and their foothills. Waves of ice sheets covered our area during the Pleistocene. The last, the Laurentide Ice Sheet covered our region with ice which in some areas was over one mile thick! This ice depressed the land, and as it melted created a series of freshwater glacial lakes over the Study area. Deltas were formed in these glacial lakes laying down large sand and gravel deposits which we mine today. Eventually the ice receded far enough north that the Missisquoi, after entering Lake Champlain, flowed north as it does through its present course up the St. Lawrence seaway and out to the Atlantic.

The waterbody that exists today as Lake Champlain was alternately connected and disconnected to western drainages at three different points in time during the recession of the last glacier. Interestingly, as the continent continues to rebound from the weight of the glaciers, Lake Champlain may once again flow southwest!) This unique series of events allowed migration opportunities for fish species traditionally considered western species in the present-day Hudson drainage to access new areas in Vermont leading to a unique assemblage of fish species in the Study area today. Vermont has nearly 80 native (post-glacial) fish species, approximately 30 more species than New Hampshire, the New England State with the next highest total species of fish. Vermont's fish diversity is directly related to the colonization of its waters by distinctively western species during these drainage changes brought

about by the last glaciation. The species considers 'western' account for nearly half of the total number of native species in Vermont today.

As a result of these glacial migration events, Vermont rivers that are connected to Lake Champlain have a diverse assemblage of fish species that are not found in other watersheds that flow to the Atlantic Ocean. According to VT ANR's Department of Environmental Conservation - Watershed Management Division's Aquatic Biologist and native fish expert Rich Langdon, the Missisquoi is home to two species of fish that are especially rare in Vermont - the fantail darter and the brassy minnow. The fantail darter is only found in ten tributaries of the Missisquoi River in Vermont. The brassy minnow is found in only six locations in the State, two of which are in Godin and Samsonville Brooks, tributaries to the Missisquoi River in Berkshire.

Langdon also states that the reach of the Missisquoi River below the Highgate Falls dam supports many State-listed (threatened and endangered) and rare fish species. While this lower section is below the Study area, the quality of water passing through tributaries and the mid and upper reaches of the Missisquoi River is critical for maintaining habitat supportive of these important species downstream.

Glacial Influence on Natural Communities

Wetland, Woodland, Wildland by Elizabeth Thompson and Eric Sorenson is the definitive guide to Vermont's Natural Communities which are defined by the book as "*an interacting assemblage of organisms, their physical environment, and the natural processes that affect them*."[2] Understanding the natural communities in the Study area fosters good decision making about land management as they are characterized by their ecology (including topography, geology, climate, vegetation, and animals typically found within). The geologic legacy of Vermont described above is directly responsible for the natural communities present in the Study area.

The glaciers that carved out our lakes and rivers also shaped the rest of our landscape, creating a great diversity of topography and an assemblage of exceptional natural features. There are several ecologically significant natural communities in the Study area that are connected hydrologically to the Study rivers, and are known for their unique communities of plants and animals. They are: Jarvis Brook Heron Rookery in Berkshire, Woodard Swamp (also known as Adams Pond and Beaver Meadow Swamp) in Enosburgh, McAllister Pond Marsh in Lowell and Tamarack Brook Flats in Lowell and Troy, and are described in the *Significant Ecological Areas* below. Also mapped on the Natural Resources ORV map are vernal pools. Vernal pools, forested swamp natural communities present throughout the Study

Figure 25. Big Falls at Sunrise. *Photo by John Selmer*

Figure 26. Featured ORV – Big Falls, the largest undammed falls in Vermont. *Photo by Shana Stewart Deeds.*

area, are seasonally temporary wetlands important to biological diversity, forest function and watershed processes. These pools are formed from spring rains and snow meltwater in small woodland depressions. They are important breeding habitat for amphibians such as wood frogs and spotted salamanders. Because these pools typically dry up in the late summer/fall, larger predators, such as fish, do not survive here – an important factor in the survival of the amphibians and small invertebrates, such as fairy shrimp, that make their homes there for part of the year. More information about vernal pools and their protections may be found in the water quality chapters of this Management Plan.

For more information on the Missisquoi and Trout waterways and their biota please visit the Water Quality chapter of this Management Plan.

Natural Resource ORVs:
Geological Features, Gorges and Waterfalls

Featured ORVs - Geological Features along upper Missisquoi and Trout River Corridor:

- **Big Falls, Troy, VT**: the largest undammed falls in Vermont; also a State park. Below the falls is a gorge over 200 feet long with 60-foot high walls. From *The Waterfalls, Cascades and Gorges of Vermont*: "The Site is about one-half mile long. Above the falls are rapids, braiding channels, low cliffs ten to 35 feet high, and many small islands. Immediately before the falls is a large pool about 100 feet wide. The falls themselves (actually steep cascades) consist of three channels and drop about 25 feet. The middle channel is beautiful and spectacular and very noisy. Below the falls there is a gorge about 75 yards long with walls about 60 feet high. The east walls are vertical, the west walls sloping. At the bottom of the gorge there is deeper water which makes good swimming, and several sandy beaches." The gorge also contains a number of rare vascular plants. The site was ranked as "high importance" in the Waterfall Study due to its heavy recreational use, significant botanical character and its distinction of being the largest natural waterfall in the State. It has also been noted as a 'significant feature' of the Missisquoi basin in previous versions of the Agency of Natural Resources' Watershed Management (Basin) Plan. *Waterfalls, Cascades and Gorges of Vermont* states that with the "…alteration and destruction of waterfalls and gorges…combined with the number of people who use and appreciate the ones that remain, seems to us to argue for the defense of every important site we have left."

- **Montgomery Schoolhouse Swimming Hole**: Located north of Montgomery Center; consists of a deep pool below two cascades, plus a rock slide, some additional pools, and secluded areas.

- **Three Holes Area, Montgomery**: This series of kettle holes along the Trout River in Montgomery

is a popular swimming area voted by *Yankee* magazine as the Best Swimming Hole in New England in their May/June 2010 Issue. There is more information about this privately owned swimming hole in the Scenic/Recreational chapter of this Management Plan.

- **Baker's Falls (Pierce Mill, Troy)**: Cascades below an old dam, the first cascade is approximately 25 feet high, followed by two ten-foot cascades. Declared to be a significant site in the Missisquoi Basin Watershed Plan and described in *The Waterfalls, Cascades and Gorges of Vermont*.

- **Missisquoi Indian Head, Troy:** Photos of this site may be found on the following website (www.panoramio.com/photo/43397621).

- **Troy Gorges** : A series of four bedrock gorges located about a mile downstream of the River Road Bridge in Troy. Deep pools separate the gorges which range in length from about 400' to 1,500' along this 1-mile segment of the upper Missisquoi River. This reach also contains the foundation ruins of an old iron smelter.

Geological Features in the Study Watershed Contributing to the Natural Resource ORV:

- **Ayers Hill**: This resource is not directly river related. From Berkshire's Town Plan - "This is a singularly unique area of 400 acres on Ayers Hill where the volcanic lava flows and volcanic bombs of the Tibbit Hill formation are readily apparent. Tibbit Hill volcanics are rift volcanics associated with the opening of the Iapetus Sea and are roughly 554 million years old. Currently, it is in private ownership and is in need of protection. This site is considered to be of State significance for its educational, scientific, and scenic value." From (1974 Berkshire Highway Survey): "Perhaps the greatest reserve of satisfactory construction material in Berkshire might be found on Ayers Hill … in the Tibbit Hill Volcanics." This resource's ability to provide quality highway material makes it vulnerable and in need of protection.

Figure 27. Baker's Falls on the Missisquoi River in Troy, VT. *Photo by Jonathan Chase.*

- **Berkshire Copper Mine**: This resource is not directly river related. From Berkshire's Town Plan - "The Berkshire Copper Mine is a 10-acre site associated with the old copper mine that is now considered an important mineral collection area. It is also in private ownership and in need of protection. The site is considered to be of state significance because of its historical, educational, and scientific value."

- **Berkshire Kettle Hole**: From Berkshire's Town Plan - "The Berkshire Kettle Hole is a well-preserved glacial feature, known as a kettle hole, which formed when a chunk of buried glacial ice melted and left a hollow or depression in the landscape. The Berkshire Kettle Hole is located on a three-acre site southwest of the hamlet of Berkshire. The kettle hole is in private ownership and in need of protection. As a glacial feature, it is considered locally significant." This kettle hole is a water-related resource, and important to the glacial history of the region.

- **Jay Branch Falls**: cascading waterfalls over an historic dam at the Jay Branch Gorge.

- **Jay Branch Gorge (Four Corners Swimming Hole)**: Listed by newenglandwaterfalls.com as a premier swimming hole in Vermont, this hole has beautiful waterfalls cut into the bedrock (Ottauquechee

Formation of black phyllite or schist with quartz). This swimming area is a series of drops on the Jay Branch called "Four Corners." They are a beautiful set of swimming holes just downhill of the junction of Route 105, Route 101 and the Veilleux Road. There are large kettle holes present, and it even used to be a destination for gold panning. Please see the swimming holes in the scenic and recreational ORV chapter of this Management Plan for more information.

- **Tillotson Mills, Lockwood Brook, Lowell**: This small woodland cascade is below a historic mill, and described in the *Waterfalls, Cascades and Gorges of Vermont*. This site is a waterfall and swimming hole, and also noted as a 'significant feature' of the Missisquoi basin in previous versions of the Agency of Natural Resources' Watershed Management Plan (Basin 6 - Missisquoi River Watershed Water Quality and Aquatic Habitat Assessment Report).

- **Twin Falls, East Branch, Lowell**: These falls are located in Lowell Village on the East Branch. Cascading falls are made by a large waterfall split in two by a bedrock outcrop. There is a deep pool below the falls which is good for swimming. This place was described in the 1991 swimming hole survey.

- **Other Waterfalls and Cascades (many under or near historic covered bridges)**:
  - Hidden Falls, Tamarack Brook, tributary to the Trout River, Montgomery
  - Gibou Road Bridge cascades and pools, Tamarack Brook, tributary to the Trout River, Montgomery
  - Taft Brook Falls, tributary to the Missisquoi River, Westfield – historic mill site on private property
  - Hutchins Bridge Cascades, tributary to the Trout River, Montgomery
  - West Hill Brook (Creamery Bridge) Falls, tributary to the Trout River, Montgomery
  - Lower Village Falls, Lowell

Figure 28. Paddling by bedrock outcroppings on the Missisquoi River in Westfield. *Photo by Shana Stewart Deeds.*

- **Richford Mineral Area**: From Richford's Town Plan - "The most significant geologic site in Richford is the Richford Mineral Area, located along Lucas Brook [a Missisquoi River tributary] in the Northeast part of the Town. The noted mineral collection site covers ten acres and contains a variety of minerals including talc, actinolite, fuchsite, and magnetite."

- Serpentine Outcrops: Outcrops occur in at least 10 locations along the Study corridor, and are associated with species of rare ferns. Serpentine outcrops are areas where serpentine bedrock is exposed. This ultramafic rock is unique because it is found more commonly deep in the Earth's mantle. Serpentine rocks are chemically distinct from other Vermont rocks; they are deficient in calcium, and rich in magnesium, iron, nickel and chromium which are often toxic to certain plant species. Occurrences of these outcroppings are tracked as rare occurrences by the Vermont Natural Heritage Information Project and are classified as S1 and G2, which means they are "very rare" and "rare" on State and global levels, respectively. The rarity of these types of rock attracts geologists from all over the world to this section of Vermont. According to Wetland, Woodland, Wildland, plant communities on these rare ledges and outcrops are also specialized, and low in diversity due to the challenges of living on this rock type. This is the only habitat in which several rare plant species can live in the state. "The Green Mountain maidenhair fern [*Adiantum viridimontanum*] grows only on serpentine soils, and its overall distribution is limited to northern Vermont and southern Quebec."[2] Serpentine maidenhair fern (*Adiantum aleuticum*), Large-leaved sandwort (*Arenaria macrophylla*), and Marcescent sandwort (*Arenaria marcescens*) are additional rare and uncommon plants which are characteristic of serpentine outcrops.

Natural Resources Featured ORVs:
Rare, Threatened and Endangered (RTE) Species and Natural Communities in the Study Area

There are many rare species of aquatic insects, amphibians, reptiles, plants and natural communities associated with the upper Missisquoi and Trout Rivers. According to their website, the Vermont Heritage Program (or NHIP – Natural Heritage Information Program), part of the Vermont Fish and Wildlife Department's Wildlife Division, "manages, and conserves Vermont's nongame wildlife [those vertebrates and invertebrates which are not hunted or fished], native plants, and natural communities." Heritage programs, such as the NHIP, participating in the national network of heritage programs rank

Table 3. Study area records for Dragonflies & Damselflies (Odonata) from the VT Natural Heritage Program.

Common Name	Genus species	SR	GR	Franklin	Orleans
Spotted Spreadwing	*Lestes congener*	S3	G5	Yes	Yes
Elegant Spreadwing	*Lestes inaequalis*	S3	G5		Yes
Vesper Bluet	*Enallagma vesperum*	S3	G5	Yes	Yes
Black-tipped Darner	*Aeshna tuberculifera*	S2	G4	Yes	Yes
Harlequin Darner	*Gomphaeschna furcillata*	S2	G5		Yes
Lilypad Clubtail	*Arigomphus furcifer*	S2	G5	Yes	
Black-shouldered Spinyleg	*Dromogomphus spinosus*	S3	G5	Yes	Yes
Beaverpond Clubtail	*Gomphus borealis*	S2	G4	Yes	Yes
Dragonhunter	*Hagenius brevistylus*	S3	G5		Yes
Southern Pygmy Clubtail	*Lanthus vernalis*	S2	G4		Yes
Maine Snaketail	*Ophiogomphus mainensis*	S2	G4		Yes
Eastern Least Clubtail	*Stylogomphus albistylus*	S3	G5	Yes	Yes
Zebra Clubtail	*Stylurus scudderi*	S2	G4	Yes	Yes
Arrow Clubtail	*Stylurus spiniceps*	S2	G5	Yes	
Williamson's Emerald	*Somatochlora williamsoni*	S3	G5		Yes
Calico Pennant	*Celithemis elisa*	S3	G5	Yes	
Belted Whiteface	*Leucorrhinia proxima*	S3	G5	Yes	Yes
Twelve-spotted Skimmer	*Libellula pulchella*	S3	G5	Yes	Yes
Band-winged Meadowhawk	*Sympetrum semicinctum*	S3	G5	Yes	Yes

occurrences of ecological resources on a State and global scale. For example, the serpentine outcrop natural community is listed as G2 below, meaning that serpentine outcrops are considered imperiled with very few populations (often 20 or fewer) in existence globally. State ranks are assigned by the NHIP, and typically reviewed annually based on the most current ecological information available. Only State ranks S3 or lower are listed below. These ranks are based on a species' vulnerability to extirpation (ceasing to exist in VT) or extinction (ceasing to exist on Earth). S3 ranking means species are vulnerable to extirpation, often due to declines to 80 or fewer occurrences in the State due to habitat restrictions or other reasons for decline. S2 ranking means species are imperiled and at high risk for extirpation, often due to declines to 20 or fewer occurrences in the State due to habitat restrictions or other reasons for decline. S1 ranking means species are critically imperiled and at very high risk for extirpation from the State, often due to declines to 5 or fewer occurrences in the State due to habitat restrictions or steep declines in numbers. Identified RTE occurrences are listed below by rank, with the most rare at the bottom. All of the species and natural communities listed below are within the Study area; however, in order to protect the rare, threatened and endangered species in the State, the specific locations of these species are not made publically available.

Vertebrate and Invertebrate Species

Invertebrates

- According to Vermont Natural Heritage Data, there are 19 species of dragonflies and damselflies in Franklin and Orleans Counties which are ranked as S3 or lower (vulnerable to extirpation to critically imperiled). The dragonhunter dragonfly (*Hagenius brevistylus*) is the only species in this genus in North America. This amazing aerialist typically lives near forested streams and rivers, but also near slower moving lakes or bays, where it hunts for other dragonflies which it catches on the wing.[6] The zebra clubtail dragonfly (*Stylurus scudderi*) is named for the swelled, club-like end to its abdomen and the alternating black and yellow (or pale green) stripes along its body. This rare dragonfly lives in clear, clean, forested streams and small rivers including trout streams.[6] You may see the males patrolling over the river guarding foraging and breeding territory.

Figure 29. Wood turtle found along the Missisquoi River in Troy. *Photo by Jeremy Deeds*

Reptiles and Amphibians

- **Mink Frog** (S3) – According to Jim Andrews, Coordinator of the Vermont Reptile and Amphibian Atlas, mink frogs are green-faced frogs that are reported to smell like garlic or onion. They prefer shallow bays and inlets and outlets of rivers, lakes and ponds. Conservation of undeveloped bays and marshlands, and education and monitoring of roads along waterways for mortality during summer breeding season would help protect this vulnerable amphibian species.

- **Ring-necked Snake** (S3) – These black snakes with a yellow belly and yellow neck ring prefer rocky woodland habitat. Maintaining small woodland openings, especially those with stonewalls, shale ledges, and rock faces and reducing road mortality will help protect this species.

- **Wood Turtle** (S3, *VT Species of Special Concern*) – These turtles have red/orange flesh, black heads, and layered scutes (shell scales) which can look like the rings in a tree. Their plastron, the bottom of their shell, is yellow with black markings. Wood turtle habitat includes streams where they overwinter, and nearby uplands and fields where they feed. They need connectivity between their streams and neighboring woodlands. Protecting these habitats along with eliminating their collection as pets and reducing road mortality will help protect this species (Figure 29).

- **Four-toed Salamander** (S2, *VT Species of Special Concern*) – This salamander is small, and approximately the size and color of the common red-backed salamander often found in woodlands. This salamander is distinguishable by its creamy, almost opal, stomach which also has a smattering of black spots. They also only have four toes on their back feet whereas most salamanders have five hind toes. Preserving their preferred habitat of vernal pool edges and small, wooded swamps, such as red maple swamps will help protect this high priority species of concern in the state.

Fish

- **Fantail Darter** (S3) – The book, Fishes of Vermont, states that the fantail darter lives in shallow areas of streams and rivers where they hunt for aquatic macroinvertebrates between rocks.[7] This fish species is at the northeastern edge of its distribution, and is only found in VT in the Missisquoi River and some of its tributaries.

- **Brassy Minnow** (S1, *VT Species of Special Concern*) – The Fishes of Vermont describes the brassy minnow as on the "extreme eastern edge of its distribution," being found in few areas in Vermont including two Missisquoi River tributaries. This minnow predominately eats algae, making it one of two true herbivore fish species in the State. For this reason, they prefer waterway reaches with muddy substrate rich in organic matter.

- **Brook Trout**, though not rare, threatened or endangered in the State, are the only trout species native to Vermont. This trout species has seen decline in numbers in recent years due to impacts by stocked trout species which are competitors for food and habitat, along with habitat alterations. These trout are coldwater species, and require temperatures typically below 65-72^{o}F. With loss of riparian trees, and increased runoff to streams water temperatures are often above levels which stress this species sometimes leading to relocation or mortality.

Native Plants

These plant species are typically associated with the rare natural communities listed below. The University of Vermont's (UVM) Pringle Herbarium is creating its virtual herbarium, which will be a good future resource for Vermont plant species. Wetland, Woodland, Wildland is also a resource along with local botanical societies such as the VT Botanical and Bird Club and VT Fish and Wildlife's Natural Heritage Program.

- **Squarrose Goldenrod** (*Solidago squarrosa;* S2S3)
- **Dwarf Bilberry** (*Vaccinium cespitosum*; S2)
- **Fragrant Fern** (*Dryopteris fragrans;* S2)
- **Great Laurel** (*Rhododendron maximum*; S2, VT Threatened)
- **Green Mountain Maidenhair fern** (*Adiantum viridimontanum*; S2, VT Threatened)
- **Hyssop-Leaved Fleabane** (*Erigeron hyssopifolius*; S2)
- **Large-leaved Sandwort** (*Arenaria macrophylla;* S2)
- **Tradescant's Aster** (*Symphyotrichum tradescantii;* S2)
- **Aleutian Maidenhair fern** (*Adiantum aleuticum*; S1)

Natural Communities

- **Riverside Outcrop** (S3) – Wetland, Woodland, Wildland Wildland describes this upland shore natural community as the places along streams and rivers where there is exposed bedrock.

Common near waterfalls, cascades and gorges, this community is found along large rivers in the State like the Missisquoi. Wetland, Woodland, Wildland lists the red-spotted ground beetle as a rare insect that may be found within this natural community. Some species of plants such as wild chives, shining ladies-tresses and several species of bryophytes (group of non-vascular plants which includes mosses, hornworts and liverworts) live in and on these harsh, riverside outcrops. Dorothy Allard , Virtual Herbarium Coordinator for UVM's Pringle Herbarium, led a 2005 inventory of bryophytes at Big Falls State Park and states that it was an "interesting place from a bryological standpoint." Both S2 and S1 species of bryophytes were found during this inventory. Contact Dorothy Allard for more information.

- **Silver Maple-Ostrich Fern Riverine Floodplain Forest** (S3) – Wetland, Woodland, Wildland describes this floodplain forest as dominated by silver maple and ostrich ferns which are able to survive in the typical, annual flooding. Other tree species often present include elm and boxelder, sometimes called ash-leaved maple. Many migratory birds are known to use this riparian habitat along with otter, mink, muskrat, beaver, and several amphibian species. Threats to this community include non-native, invasive species and conversion to agriculture and other human uses.

- **Serpentine Outcrop** (G2, S1) – According to Wetland, Woodland, Wildland, plant communities on these rare ledges and outcrops are also specialized, and low in diversity due to the challenges of living on this rock type. This is the only habitat in which several rare plant species can live in the State. "The Green Mountain maidenhair fern (*Adiantum viridimontanum*) grows only on serpentine soils, and its overall distribution is limited to northern Vermont and southern Quebec." [2] Serpentine maidenhair fern (*Adiantum aleuticum*), Large-leaved sandwort (*Arenaria macrophylla*), and Marcescent sandwort (*Arenaria marcescens*) are additional rare and uncommon plants which are characteristic of serpentine outcrops. Please see above sections for more details.

Figure 30. Wetlands in Enosburgh. *Photo by Ken Secor*

Natural Resource Contributing ORVs: Significant Ecological Areas

Significant Ecological Areas in the greater Study area watershed:

- **Jarvis Brook Heron Rookery, Enosburgh**: The Vermont Rivers Study lists this resource as "partly wooded deep marsh area which supports a great blue heron nesting colony on a half-mile stretch of an unnamed tributary of the Jarvis Brook" in its list of natural areas that are "recognized as excellent examples of Vermont's natural heritage." Multiple pairs of Great blue herons sometimes congregate at group nesting sites, called rookeries. There are 32 known Heron Rookeries in Vermont, and the largest one (~500 nests) is in Missisquoi Bay. The Jarvis Brook Heron Rookery is located in the town of Enosburgh. More information on Important Bird Areas may be found in Appendix 7.

- **Woodard Swamp, Enosburgh**: Listed in the 1986 VT Rivers Study as a "wooded swamp with beaver activity and floating vegetation" in the list of natural areas that are "recognized as excellent examples of Vermont's natural heritage."

According to the Town Plan, "Enosburgh's most important wetland is Woodward Swamp (also known as Adams Pond or Beaver Meadow Swamp) and its associated pond systems along Beaver Meadow Brook. The system includes 3 ponds along a 3-mile length from East Enosburgh to the north end of the pond located north of Woodward Neighborhood Road. It is classified as a wooded swamp with floating vegetation and bear activity."

- **Haystack Mountain Alpine Flora, Lowell**: The Vermont Rivers Study lists this resource as habitat for "rare plants" in its list of natural areas that are "recognized as excellent examples of Vermont's natural heritage." This bed of arctic flora (wildflowers generally found in arctic habitats) exists atop Haystack Mountain, Montgomery, a well-known hiking trail and destination for naturalists. The high elevation creates a climate closer to that of areas far north of the Study area. The occurrence of arctic flora in Vermont is a truly remarkable feature of the Missisquoi landscape. This resource is not river related.

- **McAllister Pond Marsh, Lowell**: The Vermont Rivers Study lists this resource as a "pond and marsh supporting ducks and trout" in its list of natural areas that are "recognized as excellent examples of Vermont's natural heritage." A 20-acre pond and marsh habitat complex in Lowell supporting many species of waterfowl as well as a trout fishery. More information on Important Bird Areas may be found in Appendix 7.

- **Tamarack Brook Flats, Lowell and Troy**: This site has an extensive beaver pond at the headwaters and an undisturbed cedar swamp and spruce fir flat south of the brook. This site has been identified as significant in the Vermont Department of Environmental Conservation's Watershed Plan for the Missisquoi Bay Basin.

- **Troy Colony of Great Laurels**: The Vermont Rivers Study lists this as a "relic colony of laurel shrubs" in its list of natural areas that are "recognized as excellent examples of Vermont's natural heritage." The Audubon Society Field Guide to the Northeast provides the following description: "The great laurel is a large and spectacular rhododendron usually found only in warmer climates than that of northern Vermont near the Canadian border. It is believed that this species was more common in northern Vermont

Habitat Connectivity

Corrie Miller, Staying Connected Initiative Project and Cold Hollow to Canada

The Northern Appalachians region, also known in the U.S. as the "Northern Forest," is one of the most intact temperate broadleaf forests in the world. Spanning two countries, four states, four provinces and 80-million acres, it provides a home for more than five million people, as well as rare alpine vegetation, many at-risk species, old-growth forests, very large blocks of unfragmented forest, and high quality rivers. Canada lynx, black bear, and other wide-ranging species still have the opportunity to roam freely across much of the area. Recent analysis reveals that the region risks being separated into a series of disconnected ecological islands — isolating wildlife populations and limiting their ability to migrate and adapt. Many species of wildlife need to move around to meet their basic life needs. To sustain healthy populations of wide-ranging mammals and other wildlife, we must maintain large areas of core habitat as well as the areas of land that link those core habitats. Consequently, "landscape connectivity" – the degree to which the landscape allows animals to move between patches of suitable habitat to meet their life needs - has emerged as a paramount conservation need. Roads, development, and people are here to stay. But with sound science, solid partnerships, and local ingenuity, we can keep the Northern Appalachians connected for wildlife and for people, today and into the future.

For More Information: coldhollowtocanada.org and our Staying Connected online Appendix

about 6,000 years ago, when the region possessed a somewhat warmer climate. This period of time is known as the *climatic optimum*…. This relic colony of great laurels is one of only two that are found in northern New England."[8] This colony of laurels was listed in the Vermont Rivers Study.[9]

Natural Resource Contributing ORVs: Critical Wildlife Habitats

There are many natural features of the watershed that, while not directly connected with the rivers, add to the character of the watershed and enhance the experiences of those who spend time there. Abundant upland wildlife, rare alpine flora and natural communities, and critical habitats such as deer wintering areas, Important Bird Areas (IBAs), and non-fragmented wildlife migration corridors add to the special quality of the upper Missisquoi basin.

- **Deer Wintering Areas** : The Vermont State Natural Heritage Information Project (NHIP) has mapped deer winter habitat in several portions of the Study area, most notably along the Trout River in the towns of Montgomery, Richford and Enosburgh. Deer Wintering Areas are defined by NHIP as "areas of mature or maturing softwood cover, with aspects tending towards the south, southeast, southwest, or even westerly and easterly facing slopes." These areas are vital to the winter survival of deer populations, and therefore important to hunting and recreational wildlife viewing in Northern Vermont.

Deer wintering areas are discussed in both regional plans. The Plan for the Northwest Region 2007-2012 lists them as critical wildlife areas which "… have been targeted for protection by the U.S. Fish and Wildlife Service, and are a consideration in development review under Criterion 8A of Act 250." Act 250 protection of deer wintering areas falls under Criterion 8A: Necessary Wildlife Habitat. Necessary wildlife habitat has become defined as "concentrated habitat which is identifiable and is demonstrated as being decisive to the survival of a species of wildlife at any period in its life including breeding and migratory periods." In effect, protecting "necessary wildlife habitat" protects wildlife habitat that if removed from the Vermont landscape would cause the decline and eventually the loss of a species of wildlife. Northeastern Vermont Development Association's Regional Plan for the Northeast Kingdom states "To promote a diversity of wildlife species, it is important to conserve various habitat types as well as critical areas that support basic needs for some species. For example, white-tailed deer live in a variety of forested and non-forested areas, but specific softwood wintering areas are critical for their survival. The deer have adapted to this habitat for their survival and

Figure 31. Mergansers along the Missisquoi. *Photo by Ken Secor*

without it they would not survive the harsh winters in Vermont." They suggest protecting critical wildlife habitat and connectivity.

There are no Statewide laws to protect deer wintering areas other than Act 250; however, towns may adopt language in their zoning bylaws protecting this critical wildlife habitat. The The Vermont Fish and Wildlife Department suggests adding language to town zoning that maintains and protects the "functional integrity of all deer wintering areas within the town or area of interest…and increases the number of deer wintering area acres that are either under long-term stewardship or that are permanently conserved in the town or area of interest."

Town Plans state the following about deer wintering areas:

◊ Three areas have been identified in Berkshire

◊ Enosburgh states that careful management of Deer Wintering Areas is of extreme importance for the species to thrive. In their zoning under *Land Use in the Conservation District* they state "This district is defined as areas that have limited development potential or are more susceptible to environmental degradation. Steep slopes (over 15%), wetlands, deer yards, and high elevations (over 1,500 feet elevation) are all areas in the conservation district."

◊ Montgomery's Plan states that "Large, contiguous [deer] wintering areas exist along the Trout and Tyler Branch of the Missisquoi River. These areas should be protected."

- **Habitat Linkages** : An important, non-fragmented, habitat corridor for bear, bobcat, moose, and deer exists along the peaks of Green Mountains in the central part of the Study area. Many wide-ranging wildlife need a combination of blocks of forest and connecting lands that many depend on for sufficient food, cover, and access to mates. These linkages, or connecting lands of small forest and woodland patches, wetlands and river corridors, allow wildlife safe movement across the landscape to their critical habitat. The Staying Connected Initiative has been working to help safeguard this habitat for wide-ranging and forest-dwelling wildlife such as bear, moose, lynx, marten and bobcat, and to protect these species from the impacts of habitat fragmentation and climate change by maintaining and restoring landscape connections across the Northern Appalachians region. The Staying Connected Initiative has been working on an analysis of Structural Pathways in the Northern Green Mountains, and their analysis may be found on the Cold Hollow to Canada project website (an excellent resource for more information) and our online Staying Connected Appendix 12. See also the fold out map at the end of the Plan.

- **Important Bird Areas** : The Vermont Audubon Society has identified Important Bird Areas (sites and habitats deemed most critical to birds) for two species in the greater watershed surrounding the Wild & Scenic Study area: Bicknell's thrush and peregrine falcon.

  Birding is important in the Study area, and often acts as a draw for tourists. In fact, the Lake Champlain Birding Trail unifies and connects 88 birding sites – including the Missisquoi National Wildlife Refuge (MNWR) and uplands in Vermont. Local businesses, such as the Phineas Swann Bed and Breakfast use their location next to the river to promote business. Their website states that the rivers are "special economic assets" which attracts tourism to our area, and that surrounding marshes "host migratory birds including great blue herons and black terns." The refuge (MNWR) provides exceptional habitat for water birds. MNWR, in Swanton, is an Important Bird Area that provides critical habitat for a large number of Vermont Species of Greatest Conservation Need such as great blue heron, osprey, the State-threatened black tern, pied-billed grebe, and least bittern. The water quality of the Missisquoi and Trout Rivers directly affects the ability of this refuge to function as critical, healthy wildlife habitat. More information about

birds, and managing bird habitat, may be found in Appendix 7.

- **Vernal Pools**: True vernal pools are wetlands that lack in or outflows and have standing water for a portion of the year typically from spring snowmelt. Because these vernal pools are ephemeral (temporary) they are not able to maintain populations of fish species. This makes them important as breeding areas for amphibians, especially those sensitive to predation by fish such as wood frogs, and to the biological diversity and watershed functions of an area. Many species of aquatic insects, salamanders, frogs and turtles depend on vernal pools as critical habitat. Fairy shrimp are small crustaceans which only live in vernal pools. The Vermont State Natural Heritage Information Project has mapped 64 distinct vernal pools in the Study area watershed; please see the Vermont Vernal Pool Mapping Project and the Water Quality Protections chapter of this Management Plan for more information.

IV.b.iii.2. Protection Goals for the Natural Resource ORVs:

≈ To preserve the natural resources and unique natural features of the upper Missisquoi and Trout Rivers so that they may be enjoyed by current and future generations.

≈ Promote the protection of the significant geologic features in the Missisquoi and Trout watersheds for their importance as educational, historical, and recreational resources as well as significance as habitat including for rare, threatened and endangered species

≈ Promote the preservation and conservation of prime agricultural soils to support working farms in the Study area

≈ Support the survey and best management of rare, threatened and endangered species and their habitats and promote biological diversity in these watersheds

≈ Educate communities about the location and importance of significant ecological areas and critical wildlife habitat such as deer yards and vernal pools

IV.b.iii.3. Natural Resource ORV Management

IV.b.iii.3.a. Threats to Natural Resource ORVs:

- Recreational Overuse: erosion, rock collecting, litter, etc.
- Poor management and protection of properties for wildlife, water quality, or geological resources
- Extraction of earth materials (minerals or construction materials) for commercial or private use
- Declines in water quality
- Poor road/stream crossings causing impediments to aquatic organism passage
- Habitat loss and fragmentation
- Loss of connectivity of wildlife habitats
- Vernal pool loss
- Recourses which are not mapped, and therefore not properly managed

IV.b.iii.3.b. Current Protections for Natural Resource ORVs:

This is a summary – please see the Natural Resource Protections chapter in Appendix 4 for more information on natural resources protections in Vermont.

Federal Protections

1973's *Federal Endangered Species Act* (P.L. 93-205) protects endangered species of fish, wildlife and plants, and authorizes the federal government to maintain a list of those species which are endangered or threatened. No one is permitted to possess, sell or transport these listed species, and may face legal penalties if they violate the law. Section 7 of this act requires the federal government not to jeopardize the species, or modify their critical habitat. The current list of federally endangered or threatened species documented in Vermont may be found online at website such as www.earthsendangered.com/search-regions3.asp.

State Protections

Vermont's Endangered Species Law

Species with a State status of Threatened or Endangered are protected by Vermont's Endangered Species Law (10 V.S.A. Chapter 123). The law states that it is unlawful for anyone to "take, possess or transport wildlife or plants that are members of an endangered or threatened species."[10] The Vermont Natural Heritage Program is tasked with the protection of rare species and natural communities (habitats). In some cases, rare species and communities are dependent upon unique geological features (such as serpentine outcrops[11]), which become protected by association with the rare species or habitat.

Vermont Wetland Rules (Including Vernal Pools)

Vernal pools are significant ecological areas protected under Vermont's wetland laws. Under Vermont's Wetland Rules, vernal pools are considered significant wetlands under wildlife habitat, Section 5.4. Typically considered Class II wetlands, they are required to have a 50 foot buffer. Jim Andrews, Coordinator of the Vermont Reptile and Amphibian Atlas promotes the Best Management Practices for Vernal Pools which may be found in the Water Quality Protections, Appendix 5, of this Management Plan.

Act 250

Criterion 8A of Act 250 includes protections of necessary wildlife habitat which is demonstrated as being decisive to the survival of a species of wildlife. Habitats such as deer wintering forests, Bicknell's thrush habitat, beech stands, wetlands that serve as important seasonal feeding habitats for bears, heron rookeries, gravel (both terrestrial and in stream beds), vernal pools, and stream and river waters have been protected as important wildlife habitat. Types of ORVs that are protected under Criterion 8A include: in-stream fish habitat; high elevation (generally over 2,700 feet) spruce-fir forests that harbor unique bird species (including the Bicknell's thrush breeding habitat); peregrine falcon nesting sites and heron rookeries; deer wintering habitat (typically conifer forests); bear habitat (beech/oak stands and certain wetlands); and vernal pools. The State of Vermont Heritage Program tracks these natural communities as well as rare plants and animals (see the Natural Heritage Information Project through the Vermont Fish and Wildlife Department for more information).

Criterion 8A of Act 250 also includes protections of rare and irreplaceable natural areas, which are defined as areas 1) where natural processes dominate over human process; 2) which have identifiable vegetation; and 3) which are unlikely to reoccur in the foreseeable future. Unusual or uncommon natural communities and significant geological features such as alpine plant communities, bogs, fossil quarries, and ledge communities have been protected under Act 250 Criteria 8A. If a unique geological feature contains rare, threatened, or endangered species, as is often the case with serpentine outcrops, the site may qualify for protection. Under this Criterion, the public's enjoyment of a protected natural area can also be protected, and Act 250 has provided isolation buffers, both auditory and visual, to protect the public's enjoyment of natural these areas.

In the Missisquoi and Trout River basin, some ORVs that may be protected under this Criterion include: numerous Serpentine Outcrops, Haystack Mountain alpine flora, and Waterfalls and Gorges.

For more information on Act 250, please see the Act 250 Appendix 9, or contact your local District Coordinator.

Town Protections

Towns and villages in Vermont have ample opportunity to protect natural resources under existing state statutes and programs. Many of these protections are fully realized through adoption of town plans, which can become regulatory documents in some instances (such as the Act 250 permit review process). Notably, all of the study towns and villages already have adopted town plans and zoning bylaws. If something in a town plan is listed as locally significant then its protection would depend on zoning. Some town plans have natural resources listed; however, it is unclear how forceful protections are without accompanying zoning if some activity threatened the existence of the feature (See the Natural Resources Protections, Appendix 4, for a review of protections in each municipality).

Five of the ten Study area towns have language in their town plans regarding the conservation of rare, threatened or endangered (RTE) species and their habitat, while four have them in their zoning bylaws. Only Enosburgh has Zoning Bylaws about geologic features, while eight municipalities mention them in their town plans.

There are some town-owned lands which protect natural resources and water quality such as the Enosburg Falls Village Forest in Berkshire along the Trout River, and the Jay Peak State Forest in Jay along Black Falls Brook and Jay Branch (both listed as important in the VT Rivers Study).

IV.b.iii.3.c. Gaps in Protections for Natural Resource ORVs:

Natural Resources—General

- Almost all land in the Study area is in private ownership; few features of the landscape, including geological features, significant ecological areas, rare species and important habitats are on lands with conservation protections, such State parks, town lands or parcels with conservation easements.

- There are no current monitoring programs to determine the levels and impact of the use of swimming holes, geologic features, and other natural areas that attract visitors

Geological Features

- There are very few regulations at the State or town level which protect geologic features, in fact only Enosburgh has zoning bylaws about geologic features

Rare, Threatened and Endangered (RTE) Species and Natural Communities

- Since many RTE species are found on private lands, they may not currently be managed to meet habitat needs of RTE species

- Without designation as threatened or endangered, there are no provisions in place at any governmental level to protect the population or the habitat of a rare species; it is up to the towns to prioritize conservation of important habitat and water quality to protect rare species. Only four municipalities in the study area include RTE species in their zoning bylaws

- The Missisquoi River and its tributaries are home to two known rare species of fish – fantail darter and brassy minnow. Richford, Lowell, Troy and North Troy have no development setback requirement at the town level for waterway

protection. This provision in these towns would enhance the habitat of and water quality for these fish species, as well as the rivers and streams throughout the watersheds

- Aquatic organism passage (AOP) has not traditionally been reviewed prior to town and village roadway projects and improvements. VTrans has recently begun utilizing a science-based approach to their construction projects

Significant Ecological Areas

- No significant ecological areas are currently identified within the Study area along the upper Missisquoi and Trout River corridor. Areas have been identified in the greater Study area, and are important to the ecological function and watershed processes

Critical Wildlife Habitats

- Unless declared in a town plan or zoning ordinance, deer wintering areas currently do not have legal protection in Vermont. Although Westfield, Montgomery, Enosburgh, Richford and Berkshire mention the importance of these areas in their respective town plans, none of the Study area town plans have explicit management goals regarding the protection of deer wintering areas. Deer wintering habitat overlaps with the Wild and Scenic Study area most notably along the Trout River in Montgomery, Richford and Enosburgh. Montgomery and Enosburgh have restrictions on development along waterways, which will help to preserve deer habitat in these areas. Richford does not have waterway setback requirements

- Vernal pools are important to ecological function and watershed processes. They also provide habitat for many species, including rare species from the Study area – four-toed salamander, mink frog and wood turtles. Vernal Pools are protected under Vermont Wetland rules. Therefore, they have more stringent protections regarding disturbance at the state levels than the Study rivers themselves; however, these important areas are not identified in any of the Study area town plans as a priority for conservation

IV.b.iii.3.d. Opportunities for Action/Management Recommendations: Natural Resource ORVs:

Education and Outreach

≈ Educate landowners about the importance and best management practices of vernal pools and other ecologically sensitive areas

≈ Work with programs such as the Staying Connected Initiative and Cold Hollow to Canada to educate communities about the importance of habitat connectivity and the location of corridors in their towns

≈ Sponsor educational workshops or hikes designed to inform community members about Vermont's geology, including the serpentine outcrops of the region

Help Promote Best Management Practices

≈ Identify road/stream crossings with inadequate aquatic organism passages; utilize available programs and technical assistance from the Vermont Fish and Wildlife Department to restore organism passages[12]

≈ Utilize the recommendations from Vermont Fish and Wildlife and information found starting on page 85 of Conserving Vermont's Natural Heritage to manage for deer yards and other wildlife habitat; help towns which wish add management goals regarding the protection of critical wildlife habitat such as connectivity corridors, vernal pools, and deer wintering areas into their town plans and zoning

≈ Many initiatives to maintain good water quality and reduce invasive species in the Missisquoi and Trout Rivers would also support preservation of

critical wildlife habitat - see the Water Quality ORV Chapter of this Management Plan for more information

≈ Encourage the management of grasslands using the USDA/NRCS pamphlet which promotes delaying mowing until after bird breeding (August 15 if possible or at least until after July 15)

Local Planning

≈ Support efforts for all towns to have conservation commissions

≈ Support efforts to fill protection gaps of significant ecological areas and critical wildlife habitat areas

≈ Assist town and village planning and conservation commissions in the creation of priorities for natural resource preservation in their respective town plans

≈ Assist town and village planning and conservation commissions in the creation of zoning bylaws that protect natural resources, especially in towns without such provisions

≈ Only Enosburgh has zoning bylaws about geologic features. Assist other towns which wish to add language about geological feature protection into their zoning

≈ Only four towns or villages include RTE species in zoning, and there are no provisions in place at any governmental level to protect the population or the habitat of rare species – help towns which wish to survey for these species and to prioritize conservation of important habitat and water quality to protect rare, threatened and endangered species

Volunteer Opportunities

≈ Help reduce effects of 'overuse' of swimming holes, geologic features, and other natural areas that attract visitors. Coordinated maintenance of trails, litter removal and education could help preserve these resources for future generations' use and enjoyment

≈ Help survey and determine presence and location of additional RTE species and habitats, perhaps through Vermont Heritage Program inventories or a BioBlitz

≈ Identify significant ecological areas and critical wildlife habitat in the Study area

≈ Identify vernal pool locations in the Study area and share information with the Vernal Pool Mapping Project

≈ Help towns get data online for public access (ex – time, date and location of Selectboard meetings, town government official listings, town owned lands with public access, etc.)

Work with Private Landowners

≈ Work with interested landowners to explore conservation easement opportunities in critical areas for natural resources, geological features and water quality preservation

Figure 32. Bobcat near the Missisquoi River, Westfield, VT. *Photo by Gustav Verderber and Jeff Parsons*

Table 4. Presence of protections in town zoning regulations. Please see the Natural Resource Protections section of this Management Plan and the town plans and zoning bylaws for the most up-to-date information.

Town	*Geological features mentioned in Town Plan?*	*Geological features addressed in zoning bylaws?*	*Rare, threatened or endangered species or natural communities mentioned in Town Plan?*	*Rare, threatened or endangered species or natural communities addressed in zoning bylaws?*
Berkshire	**Yes** The Berkshire Town Plan notes three geological areas of unique and fragile character. It is the intent of the Town to protect these and other geological sites from development that "would affect their character, value, and integrity	**No**	**Yes** Rare species are present in Town	**No**
Enosburg Falls	**Yes** Enosburg Falls' Town Plan includes a section (8.3) on site preservation and erosion control	**No**	**No** Enosburg Falls mentions RTE species in the Town Plan, but only to state that they have not yet been documented in the Town	**Yes** SECTION 8.10 SIGNIFICANT NATURAL AREAS AND FEATURES: Natural areas containing rare or endangered plants and animals, as well as other features of natural significance exist throughout the Village. [Construction] applicants shall take… measures to protect significant natural areas and features
Enosburgh	**Yes** The Town Plan for Enosburgh highlights the importance of natural features, including geological areas, in Chapter 8.	**Yes** Geological areas are also part of the Town's Zoning Bylaws, as part of the Natural Resources Overlay District (Section 570)	**No**	**Yes** Enosburgh includes the presence of RTEs in Natural Resources Overlay District (Section 570), which requires land uses and development to be compatible with needs of the RTE species and its habitat
Montgomery	**No**	**No**	**Yes** NATURAL FEATURES – Provide for long-term stewardship and protection of wetlands and waterways that have significant functions and values for rare species habitat, wildlife habitat, or natural communities and prevent additional loss of wetlands within the Town…the Non-Game and Natural Areas inventory should inform planning and development decisions in Town to conserve or otherwise protect those species and their habitats…	**Yes** Freestanding telecommunications towers or antennas over 20 feet in elevation may not be located in the habitat of any State listed Rare or Endangered Species (6.3)

Table 4, *Cont.*

Town	*Geological features mentioned in Town Plan?*	*Geological features addressed in zoning bylaws?*	*Rare, threatened or endangered species or natural communities mentioned in Town Plan?*	*Rare, threatened or endangered species or natural communities addressed in zoning bylaws?*
Richford	**Yes** Richford defines critical areas in their Town Plan as "natural areas requiring special protection from development.	**No**	**Yes** Deer yards and other important wildlife habitat should be considered by local officials when making land use planning and development decisions. Once on the Vermont Natural Heritage Program's list of rare communities, the habitat of the fantailed darter fish should be protected in local land use planning. Deer yards and other important wildlife habitat should be considered by local officials when making land use planning and development decisions. The need to encourage conservation of these areas cannot be overstated	**No**
Jay	**Yes** Lists Jay Branch as a scenic view/vista area, this would include Jay Branch Gorge. Little is stated specifically about geologic resources in	**No**	**No**	**No**
Lowell	**Yes** The Lowell Town Plan mentions encouraging development methods that "preserves trees, outstanding natural topography and geologic features and prevents soil erosion" for construction of Planned Unit Development (PUDs).	**No**	**No**	**No**
Troy/ N. Troy	**Yes** The Troy Town Plan (which includes North Troy) describes Big Falls, Bakers Falls, Jay Branch Gorge and the Troy Four-Corners Swimming Hole as unique features of the Town but does not have language about their preservation or protection.	**No**	**Yes** The Vermont Heritage Program through the Vermont Department of Fish and Wildlife tracks and monitors sites that have either been identified as State-significant natural communities or include rare, threatened or endangered plant or animal species. This information is reviewed in permitting processes such as Act 250. The Planning Commission feels it would be unfair to restrict property owners' rights on certain properties simply because their property has been inventoried.	**No**

Table 4, *Cont.*

Town	*Geological features mentioned in Town Plan?*	*Geological features addressed in zoning by-laws?*	*Rare, threatened or endangered species or natural communities mentioned in Town Plan?*	*Rare, threatened or endangered species or natural communities addressed in zoning bylaws?*
Westfield	**Yes** The spine of the Green Mountains runs through the western side of Town. Hazen's Notch State Park/ Natural Area, a steep-walled gap, lies between Sugarloaf and haystack mountains. Cliffs of serpentine rock support rare alpine Plant species and has historically been a nesting place for peregrine falcons	**No**	**Yes** The Vermont Heritage Program has identified sites including rare, threatened and endangered species, and significant natural communities in the Town. The Hazen's Notch area is particularly unique. Another area of significant importance is near the confluence of the Missisquoi River and Mineral Spring Brook. This floodplain forest is the site of several rare plants. Inside Jay State Forest is a boreal outcrop on the top of Jay Peak. A State-threatened plant species, the Great Laurel or Giant Rhododendron grow near the Westfield – Troy line. Close to the Lowell – Westfield border is a serpentine outcrop community, Brown's Ledges, where the Green Mountain Maidenhair Fern was discovered. This plant species has a global significance: there are fewer than six known sites in the world, and all are in Vermont. The Natural Heritage site designations on the map should be used as red flags which indicate the need to contact biologists with the Vermont Natural Heritage Program if there is development proposed with the site	**Yes** ...freestanding telecommunications towers or antennas over 20 feet in elevation may not be located in any of the following locations: A. The habitat of any State listed Rare or Endangered Species

Table 5. Some ORVs discussed in this chapter are covered under protections from other categories. Relevant protections for the different Natural Resource ORVs are noted in the table below. For more information about protections please see the following Protection Appendices.

Natural Resource ORVs	Protection Categories			
	Water Quality	**Historical**	**Natural Resource**	**Recreation**
Geological Features			X	X
Rare, Threatened or Endangered Species & Natural Communities	X			
Significant Ecological Areas	X		X	
Critical Wildlife Habitats			X	X

Endnotes

[1]Conserving Vermont's Natural Heritage – A Guide to Community-Based Planning for the Conservation of Vermont's Fish, Wildlife, and Biological Diversity. www.vtfishandwildlife.com/library/maps/Community_Wildlife_Program/complete.pdf

[2]Thompson, Elizabeth and Sorenson, Eric. (2000). *Wetland, Woodland, Wildland.* Hanover, NH: University Press of New England. www.vtfishandwildlife.com/books.cfm?libbase_=Wetland,Woodland,Wildland

[3]Vermont Geographic Alliance. (2009). *Vermont Geographic Alliance*. Retrieved 10-15-11 from www.vtgeoalliance.org.

[4]VanDiver, Bradford. (1987). *Roadside Geology of VT and NH.* Missoula, MT: Mountain Press Publishing Co.

[5]Vermont Geographic Alliance. (2009). *Vermont Geographic Alliance*. Retrieved 10-15-11 from www.vtgeoalliance.org/.

[6]Dunkle, Sidney. (2000). *Dragonflies through binoculars.* NY, NY: Oxford University Press.

[7]Richard Langdon, Mark Ferguson, and Kenneth Cox. (2006). *Fishes of Vermont*. Vermont Department of Fish and Wildlife, Waterbury, VT.

[8]Kulik, Stephen. (1984). *The Audubon Society Field Guide to the Natural Places of the Northeast: Inland.* National, Pantheon Books, NY, NY.

[9]VT Agency of Environmental Conservation. (1986). *Vermont Rivers Study.* Published with the assistance of the National Park Service Mid-Atlantic Regional Office.

[10]www.leg.state.vt.us/statutes/fullsection.cfm?Title=10&Chapter=123&Section=05403

[11]See pg. 216 of: Thompson, Elizabeth and Sorenson, Eric. (2000). *Wetland, Woodland, Wildland.* Hanover, NH: University Press of New England.

[12]VT FWD Aquatic Organism Passage Program: www.vtfishandwildlife.com/fisheries_AOP.cfm

Additional Resources:

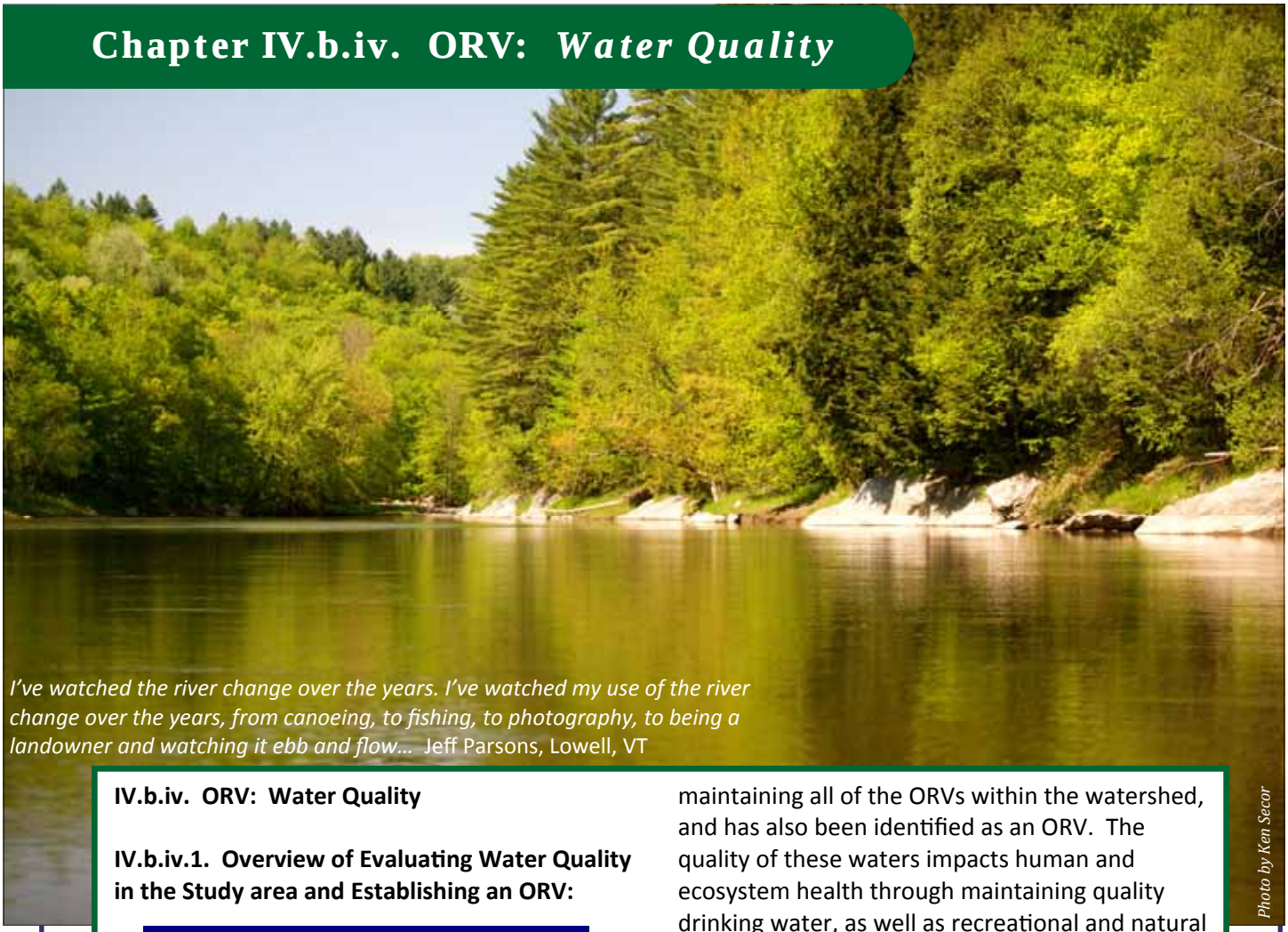
- Barry Doolan: bdoolan@uvm.edu
- The Geology of VT: www.anr.state.vt.us/dec/geo/pdfdocs/VermontGeoWebDoolan.pdf
- Marjorie H. Gale: marjorie.gale@state.vt.us
- An Environmental Scientist V, Geologist for the Vermont Geological Survey, VT DEC
- ANR Geology offices: www.anr.state.vt.us/dec/geo/vgs.htm
- Rich Langdon: Rich.Langdon@state.vt.us
- Stephen Wright: Stephen.Wright@uvm.edu
- The UVM geology department website: www.uvm.edu/geology/
- Geology of Vermont - Belvidere Mountain, Eden and Lowell, Vermont by M. Gale, 2000: www.anr.state.vt.us/dec/geo/bmtn.htm
- Jenkins, Jerry and Zika, Peter. (1985). *The Waterfalls, Cascades and Gorges of Vermont.* Waterbury, VT: Agency of Natural Resources.
- Kulik, Stephen. (1984). *The Audubon Society Field Guide to the Natural Places of the Northeast: Inland.* National, Pantheon Books, NY, NY
- Laird, J. and Albee, A.L., 1981, Pressure, temperature, and time indicators in mafic schist: their application to reconstructing the polymetamorphic history of Vermont: American Journal of Science, v. 281, p. 127-175.

- Laird, J., Trzcienski, W.E. and Bothner, W.A., 1993, High-pressure, Taconian and subsequent polymetamorphism of southern Quebec and northern Vermont: in Field Trip Guidebook for the Northeastern United States: 1993 Boston GSA, v. 2, p 1-32, 1993 Geological Society of America Annual Meeting and 85th Annual New England Intercollegiate Geological Conference Meeting, Boston, MA.
- Laird, J., Bothner, W.A., Thompson, P.J., Thompson, T., Gale, M., and Kim, J., 2001, Geochemistry, petrology, and structure of the Tillotson Peak and Belvidere Mountain mafic complexes, northern Vermont: NEGSA 36th Annual Meeting, Burlington, VT.
- Article by Bryan Pfeiffer on Vermont's new Geology Map: www.dailywing.net/2012/06/12/a-history-in-stone/
- VanDiver, Bradford. (1987). *Roadside Geology of VT and NH.* Missoula, MT: Mountain Press Publishing Company.
- Vermont Geographic Alliance: www.vtgeoalliance.org/
- *Wetland, Woodland, Wildland*: www.vtfishandwildlife.com/books.cfm?libbase_=Wetland,Woodland,Wildland

Please see the Natural Resources ORV fold out map at the end of this Management Plan.

Figure 33. Spotted salamander (left) and wood frog (right) eggs in a vernal pool. Wood frog (upper right). *Photos by Shana Stewart Deeds.*

Chapter IV.b.iv. ORV: *Water Quality*



I've watched the river change over the years. I've watched my use of the river change over the years, from canoeing, to fishing, to photography, to being a landowner and watching it ebb and flow… Jeff Parsons, Lowell, VT

Photo by Ken Secor

IV.b.iv. ORV: Water Quality

IV.b.iv.1. Overview of Evaluating Water Quality in the Study area and Establishing an ORV:

The quality of the water in the Missisquoi and Trout Rivers and their tributaries is important to maintaining all of the ORVs within the watershed, and has also been identified as an ORV.

Water Quality ORV Introduction

The quality of surface waters is directly related to the health, lifestyle and economy of the region they flow through. The Study area is fortunate to have an abundance of rivers and streams with clean water, healthy fish populations and limitless recreational opportunities. If water quality in the area was to decline, the wellbeing and quality of life for a majority of the residents would decline as well.

The quality of the water in the Missisquoi and Trout Rivers and their tributaries is important to maintaining all of the ORVs within the watershed, and has also been identified as an ORV. The quality of these waters impacts human and ecosystem health through maintaining quality drinking water, as well as recreational and natural resources. All reaches with Very Good to Excellent water quality (based on biological

Protection Goals for the Water Quality ORV:

The Wild and Scenic Study Committee promotes water quality initiatives, and recognizes the need to maintain high water quality in the region while also maintaining a working landscape of business and industry (including agriculture, logging, tourism, and recreation). Clean waterways support the economic viability of the region when maintained with good economic and ecological practices. The Committee supports new and continuing initiatives that protect the water quality and aquatic habitat of the study area along the upper Missisquoi and Trout Rivers, as well as the quality of waters and habitats in tributaries and downstream sections of the rivers, including Lake Champlain.

Figure 34. Graphic of the organization of Vermont Agency of Natural Resources' Watershed Management Division. Center graphic and more information may be found on their website.

integrity/aquatic life support) and those with "High Quality Biota" or designated as Class A are identified as supporting the Water Quality ORV. Many organizations monitor the water quality in these waterways including the Missisquoi River Basin Association with the help of the Vermont Agency of Natural Resouces's LaRosa lab. Water quality is assessed by looking at abiotic factors [such as nutrient levels (phosphorous and nitrogen typically), turbidity (water clarity), pH (water acidity), and temperature] as well as biotic factors [such as bacteria levels, macroinvertebrate communities (aquatic insects), and fish assemblages].

Water Quality and Management in Vermont

Surface waters (lakes, ponds, rivers, streams and wetlands) must be regularly monitored to determine trends in ecosystem health and water quality. Information that shows declining water quality helps resource managers prioritize funding and efforts to mitigate identified impacts, while data that show high water quality help managers to decide which areas to maintain and potentially conserve.

The Federal Clean Water act holds individual states responsible for the monitoring of their surface waters and reporting the results to the

Environmental Protection Agency (discussed further below). The water quality of the State in Vermont is under the purview of the Watershed Management Division (WSMD) in the Department of Environmental Conservation under the Agency of Natural Resources. The WSMD, formerly the Water Quality Division, recently underwent reorganization. Figure 34 gives a brief description of the current programs within the Watershed Management Division.

Water Quality Standards and Existing use

The Federal Clean Water Act seeks to maintain the water quality and uses of the nation's waters, and avoid any degradation of these resources. The Vermont Water Quality Standards require that "existing uses" of surface waters in the state be protected. The Standards define Existing Use as a "use which has actually occurred on or after November 28, 1975, in or on waters, whether or not the use is included in the standard for classification of the waters, and whether or not the use is presently occurring." Vermont DEC interprets this definition such that existing uses are a substantiation of one or more of the designated uses established by the Water Quality Standards. For example, it may be documentable that citizens regularly used a certain stream reach for the purpose of doing laundry after Nov. 28, 1975; however, this would not be interpreted by the State as an existing use that necessitated protection under the Clean Water Act, as using streams for cleaning laundry is not a designated use for Vermont waters. In the Missisquoi River watershed, existing uses include fishing, boating, contact recreation (such as swimming), public water supply, and aquatic life use support. More information on the existing uses for the Missisquoi and Trout Rivers may be found in Appendix 13.

Additionally, existing uses were reported in the 2004 Water Quality and Aquatic Habitat Assessment Report,[1] was completed by the ANR, and may be found in its entirety online. This report documents the known uses, values and significant features in the Missisquoi watershed. The uses for the mainstem Missisquoi River may be found on pages 4-5[1] and in the sub-watershed text such as Lowell Twin Falls on the East Branch on page 14. Any other uses that the Wild and Scenic Study Committee identifies will likely be known existing uses, values and significant features, and be contained in a database by the ANR which is maintained by ANR staff (currently Cathy Kashanski).

Existing uses, values and significant features currently identified by the Vermont ANR in the Study area include:

a) Waterfalls, Cascades and Gorges (1985) study sites (Tillotson Mill site on Lockwood Brook in Lowell; Bakers Falls on the Missisquoi in Troy; and Big Falls on the Missisquoi also in Troy);

b) VT Swimming Hole (1992) study sites (Big Falls on the Missisquoi mainstem, and tributaries including Lowell Twin Falls on the East Branch; Troy Four Corners on the Jay Branch; Hectorville Bridges and Hutchins Covered Bridge on the South Branch of the Trout River; Montgomery School House and Longley Covered Bridge on the Trout River; Kidder's on Tyler Branch; and Creamery Covered Bridge and Hippy Hole on West Hill Brook);

c) Whitewater Rivers of Vermont (1989) whitewater stretches on the Missisquoi River in Richford (mostly Class I but also II and III); and

d) Natural communities such as northern white cedar and red maple-cedar swamps, floodplain forests, and hardwood swamps and those containing rare, threatened or endangered plant or animal species (including Tamarack Brook Flats in Lowell and Troy, which is a site that has an extensive beaver pond at the headwaters and an undisturbed northern white cedar swamp and spruce-fir flat south of the brook).

Vermont Agency of Natural Resources Watershed Planning

Vermont has 17 major watersheds, as delineated for planning purposes; the Missisquoi Basin is identified as #6 (Figure 35). All of Vermont's watersheds have groups active with watershed advocacy and protection. The Missisquoi River Basin Association and the Farmer's Watershed Alliance are just two such groups active in the Study area. One role of the Vermont Agency of Natural Resources (ANR) is to help coordinate efforts across a number of partnership organizations so that resources and knowledge may be pooled to achieve goals. The ANR facilitates this process through the creation and implementation of Watershed Plans.

These plans are updated on a rotating basis. ANR's website lists the mission of Watershed Planners as the following.:

"Watershed Planners are responsible for river and stream water quality and aquatic habitat assessments, municipal surface water protection assistance, and the Tactical planning process. Planners evaluate river and stream problems and threats; identifies special uses, values, and characteristics; catalyzes and supports watershed organizations and projects; provides funding and technical assistance to nonpoint source planning and implementation projects; and provides information and assistance to municipalities for local surface water protection."

The Watershed Planning (formerly basin planning) program's tactical planning process is currently wrapping up for the Missisquoi Basin. The outcome of the planning process currently underway will be the Missisquoi Basin Water Quality Management

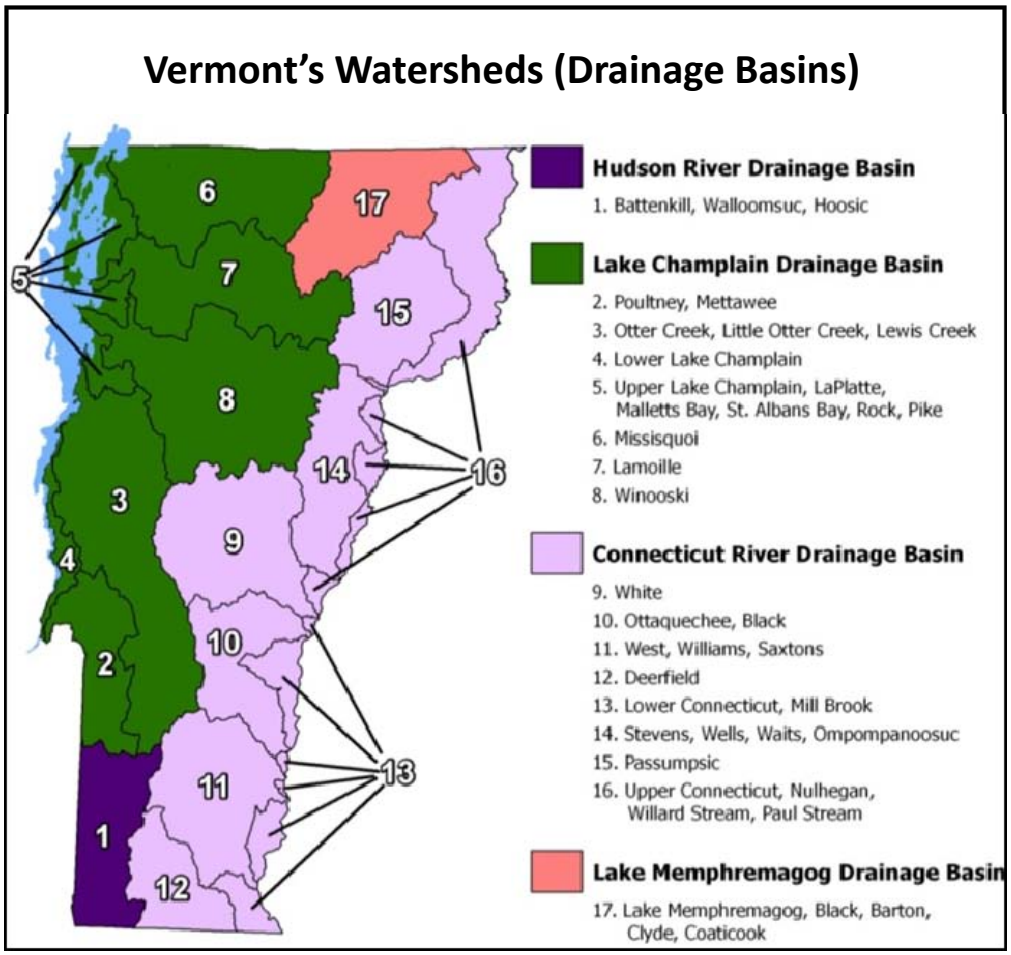


Figure 35. State Agency of Natural Resources' Vermont watershed delineation.

Plan (formerly the Basin Plan) likely appearing in the fall of 2012 for public comment.

The following is language from the Missisquoi Basin Watershed Water Quality Management Plan[2] describing the classification and uses of the surface water in the Basin with reference to the Missisquoi and Trout Rivers.

Classification: Since the 1960s, Vermont has had a classification system for waters that establishes management goals. These goals describe the values and uses of surface waters. The current classification system includes three classes: A(1), A(2), and B.

Presently, in all basins across Vermont waters above 2,500 feet in elevation are classified A(1) by Vermont statute; members of the public can petition that high quality waters with significant ecological value below 2500 feet be classified as A(1) based upon the public interest. The management objective for A(1) waters is to maintain their natural condition compatible with the following uses: habitat, aesthetics, swimming, fishing, boating. Water quality criteria, which must be met, are established in the Vermont Water Quality standards for turbidity, E. coli, habitat and dissolved oxygen (p. 28).

Waters that are managed for the purpose of public water supplies may be designated as Class A(2) Public Water Supplies. Class A streams in the Study area may be found on the ORV map; all Class A waters in the Missisquoi Basin may be found in the 2012 Water Quality Management Plan.[2] Once water management type designations are established for specific waters, it is the responsibility of the Agency of Natural Resources, individuals and all levels of government to work to achieve or maintain the level of water quality specified by the designations.

Outstanding Resource Waters: In 1987, the Vermont Legislature passed Act 67, "An Act Relating to Establishing a Comprehensive State Rivers Policy." A part of the law provides protection to rivers and streams that have "exceptional natural, cultural, recreational or scenic values" through the designation of Outstanding Resource Waters (ORW). ORW designation identifies waters that have exceptional natural, recreational, cultural, or scenic values. Depending on the values for which designation is sought, ORW designation may protect exceptional waters through the permits for stream alteration, dams, wastewater discharges, aquatic nuisance controls, solid waste disposal, Act 250 projects and other activities. The Missisquoi Basin has no ORW designations at this time.

Figure 36. A well-buffered stretch of the Trout River, below the Longley Covered Bridge. *Photo by Shana Stewart Deeds*

The mainstem of the upper Missisquoi and Trout Rivers are designated as Cold Water Habitat.

The Upper Missisquoi and Trout Rivers Study Committee generally supports the content and recommendations of the 2012 Missisquoi Basin Water Quality Management Plan. Much of the Basin Plan focuses on nutrient reductions to Lake Champlain. Since nutrients were already discussed in the Basin Plan, this W&S Management Plan did not focus heavily on this issue. The following are the action items for which the Wild and Scenic Committee is identified in the basin plan as a potential partner.

≈ Provide our management plan and ORV lists and maps to the Watershed Management Division, and identify those which would benefit from forest cover and kiosk signs

- ≈ Assist in programs which monitor, identify, and work to control invasive species
- ≈ Look into creating a VIP program around the Missisquoi and Trout Rivers (the invasive patrollers have typically been on lakes only)
- ≈ Help with monitoring and assessment of water quality in the region
- ≈ Work on creating an access survey, and more officially sanctioned public access to the waterways
- ≈ Work to educate the community on the information in our management plan
- ≈ Work in towns and villages to help them reach the goals in the Missisquoi Basin Water Quality Management Plan including: helping them develop sustainable relationships with their local rivers and streams; help identify the benefits that their rivers and streams provide; identify the potential impacts of development, wastewater treatment and stormwater disposal on their rivers and streams; participate in restoration efforts (including riparian buffer protections and plantings with landowner support); and work on international relations with Quebec watershed groups (including co-hosting paddles on the Canadian side of the border).

How Water Quality is Measured: Abiotic and Biotic (Biological Community) Assessments

The VT Water Quality Standards are a set of regulations that classify each waterbody, establish uses (such as swimming and fishing) that must be protected, and set standard criteria for chemical, physical and biological attributes of state waters that must be attained.

When water quality is assessed, water samples, typically tested for abiotic factors such as temperature, dissolved oxygen, pH, and nutrient, bacteria, and turbidity levels, give us information about a single point in time. We can determine, at that moment the sample was taken, the water quality in the system. This information is valuable, especially in understanding whether or not it is safe to swim and recreate in the rivers and streams assessed. After collecting samples over years, or above and below potential problem areas in the watershed, trends begin to emerge. Understanding a longer-term history of the water quality and overall watershed health also requires the assessment of the biota (living organisms) in the rivers and streams. These assessments are called Biological Community Assessments. Macroinvertebrates (aquatic insects such as dragonflies, damselflies, mayflies, stoneflies, and caddisflies) are one such *bioindicator,* living organisms which can tell us about health of the rivers and streams to support life. Macroinvertebrates are key indicators of water quality and aquatic habitat conditions because their life histories often contain both aquatic and terrestrial stages, and because of their limited mobility in their aquatic forms. Their limited mobility in this phase of their life cycle generally confines insects to one area of a river or stream; therefore, their presence is usually indicative of the water quality and habitat conditions where they are found. Alternatively, fish are more mobile and may only be passing through an area when they are sampled, so not necessarily residing there. As such, fish communities may also provide information about the larger watershed, not just about the reaches of rivers and streams where they are found. More information about using organisms for assessment is included below.

Macroinvertebrate Community Assessments

The Vermont Water Quality Standards (effective date December 30, 2011) provide the authority and basis to use communities of aquatic insects (macroinvertebrates) and fish to measure the quality of Vermont's rivers and streams. The Water Quality Standards also empower the Secretary of the Vermont Agency of Natural Resources to authorize the use of these numerical biological indices, which measure different aspects of biological communities such as the number of individuals within a species,

the number of species, and the tolerance to pollution of the species present, to determine whether the biological communities indicate that the stream is fully supporting its "aquatic life use" classification (e.g., Class A(1), A(2), or B). The responsibility of monitoring the aquatic communities and relating the data to the water quality standards falls on the Watershed Management Division of the Vermont Department of Environmental Conservation (DEC). DEC Biologists use a set of established methods and statistical analyses to assess the condition of biological communities across the state. These consistent methods provide an indication of the quality of the water as well as the condition of the aquatic habitat for all plants and animals that live in these environments. An outline of how these metrics and indices are calculated in Appendix 14. For a full description of methods and analyses, see the 2003 Report from the DEC.

Biological assessment (or "bioassesssment") of aquatic habitats is an effective indicator of water quality and habitat condition because species differ in their tolerance for different "stressors" that degrade aquatic habitat. Species can be sensitive, somewhat sensitive, or tolerant to a variety of stressors and pollutants in rivers and streams. The species found in a biological (especially those that tend to dominate over multiple assessments) can tell you whether the quality of the water being assessed is excellent, very good, good, fair or poor. For example,

- Many species of stoneflies (order Plecoptera) are very sensitive to levels of dissolved oxygen and will not be found in streams where dissolved oxygen is not present in adequate levels. (Very high temperatures, stagnated water or chemical pollutants may affect oxygen levels in surface waters).

- Some species of mayflies (order Ephemeroptera) are sensitive to acidic waters and will not be found in streams with acid impairment. (Mayflies are one group of macroinvertebrates very important to fish, and many people who fly fish try to time their fishing during hatches [mass emergence] of these insects.)

- Midges (Order Diptera, family Chironomidae) are a very common fly that exists in many types of aquatic habitats. Several species of midge are tolerant to organic pollution such as nutrient enrichment. (The presence of large numbers of midges suggests that there may be nutrient issues in the watershed.)

- Native brook trout and other salmonid fish, characterized by their tendency to swim upstream in fresh water to spawn, are generally sensitive to changes in water temperature. In order for a river or stream to have suitable habitat for brook trout, the water must not be too warm (the upper limit for suitable water temperature for brook trout is usually 65-72°F) for extended periods of time. (A vegetated riparian (riverside) buffer, such as the silver maple trees shading some areas of the Missisquoi River, helps to keep the water temperature at a level which can sustain trout populations.)

The Missisquoi in and below Enosburgh is a special place. Important Enosburgh history has occurred in a number of places. I have fished the river since the age of 10 and have many great memories; fishing with little frogs for bait for the first time off "the point"…fishing upstream and hearing the "sploosh" sound as heavy sinkers hit the water…fishing for larger fish in colored water off the outlet pipe from the creamery, and collecting dobsonflies (hellgrammites) from rocks submerged in rapids at end of the island below the bridge. Dobsonflies, like frogs, are great bait. It would be nice to continue to walk the trails and fish the banks that I know along the river for the rest of the time that I have here; however, stream access for fishermen and others has greatly diminished in Vermont in the last 30 years, land access for hunters as well. My greatest fear at this point in time would be that property access could be gone permanently.

Mike Manahan, Enosburg Falls

Figure 37. Students in Montgomery, VT learning about aquatic macroinvertebrates and water quality at a "Bugworks" event sponsored by the Wild and Scenic Study Committee. *Photo by Shana Stewart Deeds*

- Presence of largemouth bass and yellow perch indicate warm water temperatures for a significant portion of the year. (These species are found more frequently in lakes, ponds, and slower -flowing sections of rivers and streams).

Using numerical values related to the presence of various species found in a stream, biologists calculate "metrics" which provide numerical scores of the quality of the water and habitat. This is how scientists are more easily able to compare one water body to another, or compare the present water quality of a water body to historical records. The various metrics are calculated to assess interactions between the macroinvertebrate communities and their waterway such as:

- The pollution tolerance of the resident macroinvertebrates - this evaluates the level of organic and/or inorganic pollution present in the stream

- The taxonomic structure of the macroinvertebrate community - this evaluates the biological diversity (number of different species) within the community

- The composition of various feeding guilds present within the macroinvertebrate community – understanding the number of individuals with a particular feeding type (grazers, scavengers, predators…) allows scientists to evaluate the prevalence of different trophic (feeding) levels in the habitat and help evaluate the amount of pollution and the health of the macroinvertebrate community

A stream site will receive a pass or fail grade for each of the eight macroinvertebrate metrics based on the standards set for each stream type. Whether or not a stream reach is determined to *Support Aquatic Life Use* (meet water quality standards) or *Not Support Aquatic Life Use* (fails to meet water quality standards) depends on how many metrics are determined to pass.

Fish Community Assessments

Fish metrics are calculated similarly to macroinvertebrate metrics, and represent various aspects of the structure of fish communities and their interactions with their environment. Information on native species abundance, tolerance of resident fish species to different stressors , diversity and density of fish species and the presence of differing trophic (feeding) levels are all included in the metrics for fish community evaluation. The Vermont DEC compiles fish metrics into an Index of Biotic Integrity (IBI), which provides a single score that is the combination of all fish metrics. The VT DEC uses two fish IBIs: one for cold water fisheries (CWIBI) and one for mixed

The macroinvertebrate metrics are used to assign an overall water quality ranking to a stream reach. These designations categories, ranked from best water quality and habitat condition to worst, are *Excellent*, *Very Good*, *Good*, *Fair* and *Poor*. The scores for river reaches are evaluated by Vermont DEC's Agency of Natural Resources Watershed Management Division scientists to determine into which of these categories the reach should be placed. **Sites that have been identified as *Very Good* and *Excellent* have been selected as supporting the Water Quality ORV.**

Fish Community Assessments

Rich Langdon, Agency of Natural Resources Watershed Management Division, notes that the IBIs apply only to wadeable waters, approximately a water level at knee height. Only portions of the Missisquoi River small enough in which to wade are assessable using the IBIs. All of the Trout River and much of the upper Missisquoi River from the headwaters to Troy/North Troy are wadeable. Determining which to use requires initial sampling of the native fish species present (2-4 species is the CWIBI and >4 MWIBI. The lower reaches of the Trout River are assessable using the MWIBI, and the upper reaches using the CWIBI.

water fisheries (MWIBI). For the purposes of applying an IBI, all *wadeable* streams in Vermont located at elevations of over 500 feet will be designated as cold water; this applies to streams in the Study area. Many of the streams in the Study area are above 500 feet and thus considered cold water fisheries. All streams below 500 feet are classified as warmwater streams unless naturally-reproducing coldwater species are present. The indices are not designed for slow- flowing, sand-bottomed streams or large non-wadeable rivers. The river at Enosburg Falls is below 500 feet (~390 feet).

Calculations for the two indices are summarized in Appendix 14. For a thorough description of the IBIs, their calculation and utilization in determining aquatic life use standards, please refer to the original VT DEC document.

Using Fish Indices to Determine Support of Water Quality Standards

All possible scores for Coldwater and Mixed-water Indices of Biotic Integrity and the corresponding water quality classification contained in the Vermont Water Quality Standards are presented in Appendix 14. If a site meets the required score for its corresponding Water Quality Standard (e.g., A(1), B (2), etc.), then it supports its designated aquatic life use standard established under the Clean Water Act and Vermont Water Quality Standards. If the score fails to reach the corresponding standard for the water body, then that water body is in "non-support" of its designated water quality standard use and is placed on the 303d list.

Identifying ORVs based on Water Quality Data

All rivers and streams in the Wild and Scenic Study area designated as Class A have been identified as supporting the Water Quality ORV in this Management Plan. Class A(1) waters, that flow above 2500 feet in elevation or are of significant ecological value, qualify for ORV status because they represent unique habitats within the state, are generally of very high quality and have the strictest protections in the Vermont Water Quality Standards. Class A(2) waters, which are public water supplies, are also a unique feature of the watershed because the water has been designated to serve that purpose (Class B waters may be made suitable for human consumption with filtration and treatment).

As with the macroinvertebrate metrics, the fish IBIs are used to assign an overall water quality ranking to a stream reach. The rankings are based on the overall IBI score. Sites that have been identified as Very Good and Excellent have been selected as supporting the Water Quality ORV.

Sites where the Vermont DEC has determined aquatic communities (macroinvertebrates and/or fish) to be "Very Good" or "Excellent"[3] are also identified as supporting the Water Quality ORV. The occurrences of communities of this quality are indicative of the best water quality and outstanding aquatic habitats in the state of Vermont.

Additionally, DEC biologists have further classified a subset of river and stream reaches as "High Quality Biota," indicating that these habitats support naturally functioning, exceptionally healthy biological communities. These High Quality Biota sites are identified as supporting the Water Quality ORV as well.

Lists of Water Quality Resources contributing to the Water Quality ORV within the upper Missisquoi and Trout Rivers Wild and Scenic Study Area:

Class A(1) Waters (Above 2500 feet in elevation or of significant ecological value):

Portions of the headwaters of (all are Missisquoi River tributaries unless noted):

- Hannah Clark Brook, Montgomery
- Wade Brook (Trout River trib.), Montgomery
- Jay Brook (Trout River trib.), Westfield and Montgomery
- Black Falls Brook, Montgomery and Richford
- Stanhope Brook, Richford
- Jay Branch tributary, Jay
- Mill Brook, Westfield

Class A(2) Waters (Public Water Supplies):

All or significant portions of the watersheds of (all are Missisquoi River tributaries unless noted):

- Trout Brook, Berkshire and Enosburgh
- Hannah Clark Brook, Montgomery
- Black Falls Brook, Montgomery and Richford
- Loveland Brook, Richford
- Stanhope Brook, Richford
- Coburn Brook, Westfield and Troy

Macroinvertebrate Community Assessments

(Those invertebrate communities ranking Very Good or above in most recent VT DEC assessment):

Excellent:

- Berry Brook (Missisquoi River Tributary, Richford)*
- Missisquoi River (Richford)
- Burgess Branch (Missisquoi River Tributary, Lowell)*
- Burgess Branch Trib #8 (Missisquoi River Tributary, Lowell)*

Excellent – Very Good:

- Missisquoi River (Enosburgh)
- Jay Branch's Unnamed Tributary #8 (Jay)
- Jay Branch's Unnamed Tributary #12 (Jay)
- Jay Branch's Unnamed Tributary #13 (Jay)
- East Branch Missisquoi River Trib #8 (Lowell)
- East Branch Missisquoi River Trib #10 (Lowell)
- Mineral Spring Brook (Missisquoi River Tributary, Troy)

Very Good:

- Missisquoi River (Richford)
- Ace Brook (Missisquoi River Tributary, Lowell)
- Burgess Branch (Missisquoi River Tributary, Lowell)*
- Beetle Brook (Missisquoi River Tributary, Troy)

High Quality Aquatic Insect Community Sites (Ranked by VT DEC scientists as "High Quality Biota" sites[3]):

- Missisquoi River (Richford)
- Berry Brook (Missisquoi River Tributary, Richford)*
- West Hill Brook (Trout River Tributary, Montgomery)
- Jay Branch (Missisquoi River Tributary, Jay)
- Jay Branch's Unnamed Tributary #10 (Jay)
- Jay Branch's Unnamed Tributary #12 (Jay)
- Burgess Branch (Missisquoi River Tributary, Lowell)
- Mineral Spring Brook (Missisquoi River Tributary, Troy)
- Coburn Brook (Missisquoi River Tributary, Westfield)

Fish Community Assessments:

(Those invertebrate communities ranking Very Good or above in most recent VT DEC assessment):

Excellent:

- Trout River (Berkshire)

Very Good:

- Taft Brook (Missisquoi River Tributary, Westfield)

**Some sections of these streams are currently impaired*

The Trout River Demonstrates Success

Agricultural runoff and stream bank erosion issues were documented for the Trout River, but efforts have been successful in mitigating these issues. Money from FEMA and other sources helped the ANR and MRBA complete a restoration project on the Trout that created a mile of buffers resulting in a stable river. Macroinvertebrate and fish samples taken as follow up for this project's completion demonstrated communities in *Good* and *Excellent* condition, respectively. Several quality swimming holes may be found on the Trout in Montgomery which are utilized due, in part, to their high water quality.

Figure 38. The Missisquoi River, above Richford and downstream of the Canadian border. This site has been identified by the Vermont Department of Environmental Conservation (DEC) as supporting a "High Quality" biology community of aquatic macroinvertebrates and fish. *Photo by Ken Secor*

IV.b.iv.2. Protection Goals for the Water Quality ORV:

The Wild and Scenic Study Committee promotes water quality initiatives, and recognizes the need to maintain high water quality in the region while also maintaining a working landscape of business and industry (including agriculture, logging, tourism, and recreation). Clean waterways support the economic viability of the region when maintained with good economic and ecological practices. The co-existence between the working landscape, water quality and natural heritage is an on-going, active and collaborative effort among many invested partners. The Committee believes the efforts of those who support traditional lifestyles and occupations also prefer and typically utilize practices that maintain high water quality. The Committee supports new and continuing initiatives that protect the water quality and aquatic habitat of the Study area along the upper Missisquoi and Trout Rivers, as well as the quality of waters and habitats in tributaries and downstream sections of the rivers, including Lake Champlain. Keep in mind that the recommendations included in this Management Plan are voluntary and are not obligatory provisions required by the Wild and Scenic Act.

≈ Prioritize the reduction of sediment and phosphorus inputs to the Missisquoi River. Assist towns and landowners in the implementation of programs to preserve and protect water quality in the Study area, the lower Missisquoi River, and Lake Champlain (possible partners: Lake Champlain Basin Program, Lake Champlain Commission, Lake Champlain International, Farmer's Watershed Alliance, Waste Water Treatment Plants, Missisquoi River Basin Association, Friends of Northern Lake Champlain, the Northern VT Resource Conservation & Development Council, the Agency of Natural Resources, and the VT Agency of Agriculture, Food and Markets)

≈ Participate in review of town plans and zoning bylaws to encourage towns and villages to adopt sound best management practices for the health of the Missisquoi and Trout River watersheds which are supported by sound river science. These may include:

- encouraging development setbacks, at least a minimum 25-50 foot buffer adopted by all town and village zoning
- encourage participation in the expertise and funding provided by Act 110 which mitigates flood hazards, and manages river corridors, and stream alteration
- encourage the mapping of Fluvial Erosion Hazard (FEH) areas and the incorporation of these areas into Town zoning, setback and buffer regulations

≈ Support the science-based efforts of the Vermont Agency of Natural Resource's River Management Section and the Vermont Department of Fish and Wildlife in the upper Missisquoi and Trout watersheds including efforts to:

- increase Aquatic Organism Passage, flow, and sediment movement by properly sizing culverts
- support changes to FEMA's reimbursement scheme after disasters to include improvements such as proper culvert sizing
- close gaps in Phase I and II geomorphological assessments
- encourage Riparian Buffer easements where landowners are interested
- provide educational opportunities about river dynamics such as flume workshops for all road crew employees in Franklin and Orleans counties
- protect and restore water quality on the mainstem of the Missisquoi and Trout Rivers, especially projects which will protect or enhance our ORVs
- support projects on tributaries as well since they support the water quality of the mainstem of the Missisquoi and Trout Rivers along with the downstream waters

IV.b.iv.3. Water Quality ORV Management

IV.b.iv.3.a. Threats to the Water Quality ORV:

Sources reviewed indicate that nutrient and sediment inputs currently have the greatest negative impact on the Missisquoi and Trout Rivers. The 2004 Water Quality and Aquatic Habitat Assessment Report discusses the mid Missisquoi River reach (including the Trout River) in Franklin County. The activities and land uses impacting inputs of sediments and nutrients in the Study area may include erosion from streambanks and streambeds, and runoff from yards and agricultural fields.

Potential impacts to the water quality in this reach include at least ten permitted stormwater discharges that go to the mid-Missisquoi River and its tributaries. The Trout River does not have a wastewater facility, though one was proposed, but does have a redemption center where discharge of pollutants were elevated from 1994-1996. The Trout River is most impacted from residential development, road runoff, and flood damage. Godin Brook, Samsonville Brook, and sections of Berry and Trout Brooks impact the water quality of the Missisquoi River because they are listed on the 303d list of impaired waters, and in need of a TMDL (Total Maximum Daily Load) due to agricultural runoff, and aquatic habitat impacts. The 303d list is described by the EPA on their website as follows:

Under section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop lists of impaired waters. These are waters that are too polluted or otherwise degraded to meet the water quality standards set by states, territories, or authorized tribes. The law requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters. A Total Maximum Daily Load, or TMDL, is a calculation of the maximum amount of a pollutant that a waterbody can receive and still safely meet water quality standards.[4]

The 2004 water quality report also discusses the upper Missisquoi River reach in Orleans County. Discharges in this reach include three permitted direct wastewater discharges (North Troy, Troy/Jay, and Newport), two permitted indirect wastewater discharges, and at least seven permitted stormwater discharges to the upper Missisquoi River and its Tributaries. Portions of Burgess Brook, Coburn Brook and Mud Creek impact the water quality of the Missisquoi River because they are listed on the 303d list of impaired waters, and in need of a TMDL (Total Maximum Daily Load) due to agricultural runoff, nutrient enrichment, and, in the case of Burgess Branch, asbestos mine tailings erosion and asbestos fibers (as of the writing of this document the Towns of Lowell and Eden voted against inclusion in the federal Superfund program to clean up this site). Jay Branch is also contributing to decreased water quality in the Missisquoi River as it is listed as impaired due to sediment pollution from erosion from land development activities (predominately resort development).

Efforts have been made to get these reaches back to compliance with VT's Water Quality Standards, get the aquatic biota (macroinvertebrates and fish) back to at least a *good* status, and reduce the impairments to aquatic biota/habitat, contact recreation such as swimming, and aesthetics due to nutrient enrichment, pathogens, organic matter and sediments from poorly mitigated agricultural, development and construction activities. The 2004 report indicates the need for improvement in the Missisquoi and its tributaries to reduce impacts causing increased erosion and sedimentation,

The 303d List

Failing during the assessment of a Biotic Index is one way a water body is determined to be "impaired." In this instance, it is the aquatic life "use" that the waterbody fails to attain, thus it is added to the 303(d) list of impaired waters that is reported to and approved by the EPA annually. This list contains all waters identified as impaired in Vermont, and may be found in Appendix 17. For many of these impaired waters, depending on the impairment, TMDLs (Total Maximum Daily Loads) are established. TMDLs are the maximum levels of pollutants allowed into surface water in order to get the waterway back in compliance with water quality standards.

Figure 39. Japanese knotweed, an exotic invasive species, grows along many portions of the upper Missisquoi and Trout Rivers. This photo was taken on the Missisquoi River in Richford, Vermont. *Photo taken by Shana Stewart Deeds*

increased turbidity, habitat modifications, temperature increases, nutrient enrichment, asbestos mining, gravel pit operations, development and snowmaking withdrawals. Suggested practices include reduction of sedimentation and enrichment from agricultural practices, increased riparian buffer with native vegetation, improved water storage, and limited livestock access to the waterways. Please see Table 5 on pages 27-28 of the 2012 Missisquoi Basin Watershed Water Quality Management Plan for a list of impaired uses in the Basin. A full list of reaches in the Study area on the yearly EPA approved 303d list may be found on the Vermont Watershed Management Division's website.

In the Missisquoi Basin, the following waterways have been listed as impaired due to *E. coli* from agricultural sources: Berry Brook (mouth to 1-mile upstream), Godin Brook, and Samsonville Brook. Portions of Coburn Brook, Mud Creek and Trout Brook are also impaired due to agricultural runoff. Burgess Brook is impaired from asbestos mine tailings. Jay Branch and Tributary 9 are impaired due to erosion from land development activities and flow alteration. Pike River, Missisquoi mainstem, Black Creek, Tyler Branch and Trout River are all in need of further assessment (see the 303d list).

The 2012 Missisquoi Basin Water Quality Management Plan should be consulted for a full description of the water quality, watershed issues, Vermont ANR Watershed Management Division's management goals, and implementation strategies for those goals in the Missisquoi watershed. Below is a summary of some of the main threats to water quality within the upper Missisquoi and Trout River watersheds taken from the draft of this 2012 document as well as other resources. Please also see the Vermont Surface Water Management Strategy, especially the Stressor chapter,[5] for threats to Vermont's water quality, and management goals. This Management Plan has groups these threats as they were grouped in the Draft 2012 Missisquoi Basin Watershed Water Quality Management Plan for ease of comparison.

- **Acid Deposition**: Acid rain may lower the pH of our waterways below a neutral 7. Lower pHs can lead to an increase disease or mortality in aquatic organisms. The Missisquoi Basin Water Quality Management Plan reports that "While acidification is a moderate stressor in most of the Missisquoi basin, it is a primary source of impairment for King's Hill Pond in the Tyler Branch Watershed [Enosburgh]."[2]

- **Invasive Species**: Non-native terrestrial and aquatic diseases, plants and animals which invade natural areas and have negative effects including displacing native species and decreasing the diversity and the health of river systems. Japanese knotweed, phragmites (common reedgrass), poison parsnip and giant hogweed seem to be the most common invasives in the Missisquoi and Trout watersheds. Outside of the Study area, though in the lower Missisquoi River, Missisquoi Bay or Lake Champlain, Eurasian watermilfoil, zebra mussel, purple loosestrife, and Eurasian reed canary grass have been found. Quickly responding to new populations of invasive species, while also managing those established, such as the Japanese knotweed pictured below, is crutial to mitigating the negative effects of these non-native species.

- **Channel/Land Erosion**: Rivers are always moving, and some channel erosion is to be expected along a river; however, when rivers are out of equilibrium (the term used for stable rivers in balance; balanced water and sediment supplies and movement causing the minimum amount of erosion in the channel) surrounding areas experience increased erosion, conversion or loss of stream habitat, and enhanced threat of flooding. Fluvial geomorphology is the study of the shape of the land and how flowing water (rivers) shape the landscape (*fluvial*-river; *geo*-earth; *morph*-shapes; *ology*-study of). Vermont ANR's River Management Section, and local consulting firms such as Arrowwood Environmental have conducted these fluvial geomorphologic studies on sections of the

Figure 40. An example of an intact riparian buffer as seen along the Missisquoi River in Westfield. Vegetated buffers like this filter pollutants from stormwater, help reduce erosion, minimize flood damage, provide shade that helps keep water temperatures cool, and contribute organic material to the river which provides food and habitat for aquatic animals. *Photo by Shana Stewart Deeds*

Missisquoi and Trout Rivers and their tributaries. According to the River Management Section of ANR's Water Quality Division around 75% of the waterways in the region, and in fact the state, are in disequilibrium often caused by dredging, berming, armoring, straightening, ditching, draining, diverting, or damming the river (Presentation by Mike Kline, Living with Vermont's Rivers Conference, May 16, 2012).

- **Lack of vegetated buffer/Encroachment:** Anything which causes a reduction or lack of a natural, vegetated buffer along the river or stream (construction of buildings, transportation and utility infrastructure, fill, alteration of the natural stream channel, and vegetation removal) can increase erosion and runoff, and negatively impact in-stream and riparian habitat, water quality, and flood attenuation. Thermal stress, temperatures outside the range of surviving or thriving for aquatic organisms may occur from lack of buffers, damming of waterways, or climate change. Typically a 50-100 foot buffer of native vegetation is recommended; a 100 foot buffer is considered the minimum required for infiltration of overland flow and maintenance of water quality. Though the Study Committee understands the encroachment that buffers may

have on developed land, the values and benefits of a buffer to a water body are increased with wider buffers. Buffers of 600 feet and greater are necessary to support terrestrial wildlife that depend on aquatic ecosystems, such as deer and moose. Buffers of shorter widths provide streambank stability (15 feet) and important habitat structure such as woody debris and leaf litter (25 feet; see Figure 41 below).[6] The U.S. Department of Agriculture's Natural Resources Conservation Service (NRCS) mapped the stream buffers in the Missisquoi Basin. NRCS mapped the presence of 25-foot vegetated stream buffers, which is the minimum buffer width required under NRCS standards for filter strips. 33% of the riparian areas along the Missisquoi River and its tributaries did not have adequate stream buffers. The map may be found in the Missisquoi Basin Water Quality Management Plan (Figure 4 on Page 23).[2] There is not a continuous buffer of at even 25 feet along the mainstem of the Missisquoi and Trout Rivers in all study towns and villages; in fact there are gaps where there are no buffers at all. Tributaries tend to have more intact buffers than the mainstem. Development in these watersheds should be monitored for adverse impacts to water quality. The passage of Act 110 and 138 (Acts relating to the regulation and permitting of flood hazard areas, river corridors, and stream alteration) guides the Vermont ANR's River Management Section in its efforts to protect riparian corridors. The river Management Section does not prescribe a specific buffer width for healthy, equilibrium streams in Vermont, but does encourage assessments of stream geomorphology and plans guided by these data. More information may be found on the ANR website.[7]

- **Wetland/Aquatic Habitat Loss:** Wetlands serve many functions including: providing wildlife habitat (including amphibians and fish), reducing erosion and runoff, protecting water quality, maintain appropriate water levels in rivers and streams, reducing flooding, and providing recreational opportunities. Wetlands are lost or degraded each year in Vermont reducing the positive impact they have on humans and the environment. Vermont ANR's Lake Champlain Wetland Restoration Plan mapped wetland restoration potential in the watershed. The map may be found in the Missisquoi Basin Water Quality Management Plan (Figure 5).[2] All towns and villages within the Study area have wetlands with the potential for restoration. At least Berkshire, Richford and Jay have wetlands with the highest potential for wetland restoration. See also the fold out maps at the end of this Management Plan.
- **Water withdrawals/Flow impacts:** Alterations to the natural flow (speed, volume, duration, and timing) of water in the Missisquoi and Trout Rivers and their tributaries can have negative impacts on abiotic habitat parameters (temperature, pH, oxygen, turbidity, or pollutant levels) and, in turn, the organisms which live there. Alterations with impacts can range from undersized culverts to

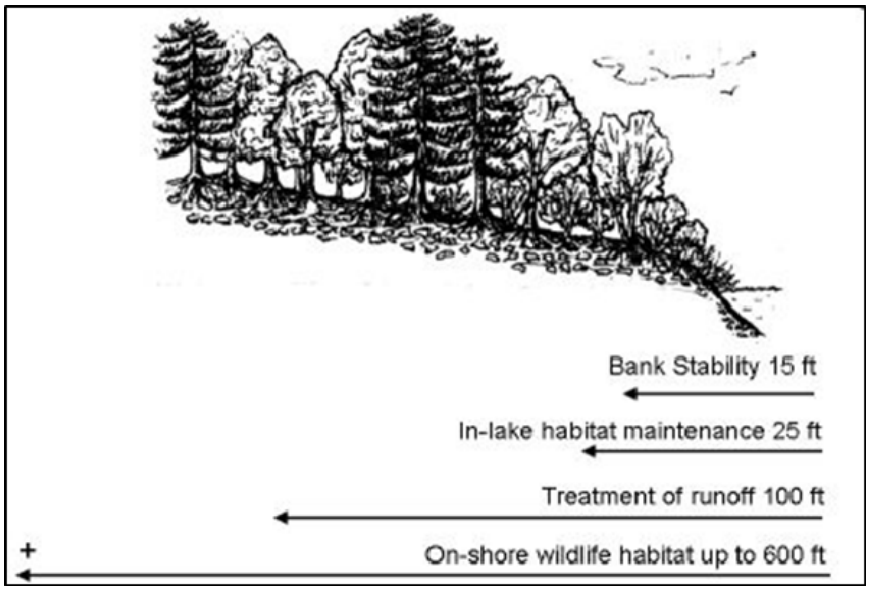


Figure 41. Diagram of buffer widths and the continued benefits that are achieved as the buffer becomes wider. *Image copied from VT ANR's Lakes and Ponds section's webpage.*

Figure 42. An unbuffered stretch of the Missisquoi River in Westfield, showing signs of significant erosion. This area, and stretches of river banks similar to it, contribute excess sediments and nutrients to the rivers. This contributes to reduced water quality, higher water temperatures and loss of habitat for aquatic animals. *Photo by Shana Stewart Deeds*

dams and large-scale development projects. Development in these watersheds should be reviewed and monitored for adverse impacts to water quality.

- **Sedimentation/Nutrient Enrichment:** Sediment inputs, from land runoff and erosion (especially from exposed bare ground from development and agriculture) or streambank erosion and in-stream channel movement, can be a big problem for rivers and streams. Nutrient impacts have long been an issue for the Missisquoi Bay and Lake Champlain. Sedimentation and nutrient enrichment from agricultural (lack of BMPs), and residential (over-fertilization, septic tank failure, stormwater inputs, and exposure of bare ground/ development near or in the floodplain) practices may have negative impacts on the water quality within the watershed.

Waste Water Treatment Plants (WWTPs) within the Study area are: the Troy/Jay plant in Troy, the Richford Plant, and the Enosburg Falls plant. These facilities, though, are permitted to discharge treated effluent by their permits that are designed to achieve water quality standards and arguably provide a positive service to the region. According to Missisquoi Basin Water Quality Management Plan, the Missisquoi Bay watershed is the greatest contributor of phosphorous to Lake Champlain. Studies have shown that these nutrients typically come from non-point sources, rather than point sources such as WWTPs.[2] The Lake Champlain Basin Program works with partners in Vermont, New York and Quebec to improve the water quality of Lake Champlain. The Program's Management Plan, *Opportunities for Action*, published in 1996, 2003, and 2010 identifies phosphorus pollution, toxic substances and pathogens, and invasive species as

the major threats to the lake. Please see *Opportunities for Action* a thorough discussion of nutrient pollution in the watershed. Phosphorous (P) pollution has been particularly troublesome in the watershed and lake because of P can adsorb to sediment particles, and under certain conditions be rereleased into the water. Because of this, reductions in P into the waterways may be masked due to re-suspension of historic nutrients back into the water column.

- **Pathogens/Toxins:** Historically the Missisquoi and Trout Rivers contained toxins input directly from industry such as textile mills (toxins) and slaughter houses (materials which deplete oxygen as they are decomposed, and pathogens). Today, the pathogens most likely to be found within the Study area are those associated with human and agricultural waste discharge. Typically *E. coli* is used as an indicator of waste within the rivers and streams. One may think of WWTPs as contributing to the pathogens entering the river, yet they use disinfection procedures, and their permitted releases have stringent *E.* coli restrictions. Waste does enter streams in varying ways including failing septic systems, combined sewer overflow events which may overwhelm WWTPs, runoff from residential areas containing pet waste, runoff from natural areas containing wildlife waste, and agricultural runoff. (There are two, partially completed CSOs in Richford.)

> *[Agricultural issues and water quality efforts] strike a particularly close chord for me...what I live and breathe on a daily basis. I think it is so important to make sure and let the general public know how hard most of the farming community works to keep our waters clean and our soils and soil nutrients where they belong!*
>
> **Jacques Couture, Westfield**

Mercury is the toxin of greatest concern in the Missisquoi and Trout River watersheds. Mercury is released into the atmosphere from reactions such as combustion, and concentrates the higher one samples within the food chain. Predatory fish which consume other fish and humans are at greatest risk of ingesting mercury above recommended levels. In the watershed, below the Wild and Scenic Study area below the Sheldon Springs dam, the Missisquoi River is considered impaired due to mercury.[2] Fish within the Study area should be monitored for mercury levels.

- **Climate Change:** In recent years global climate change has been an increasingly discussed threat to our natural resources. Scientists believe, and in some cases have already documented, local vulnerabilities and changes attributable to climate change; we are still studying what the specific changes to waterways, wildlife, and natural communities may be. In the meantime, scientific research indicates that people need to take immediate steps to alleviate the stress of climate change. In response to this threat, the Vermont Agency of Natural Resources has established a Climate Change Team. Vermont ANR's website is a great resource for more information, and states, "Our team is working to identify climate-related threats, develop solutions and implement steps to help us mitigate impacts and incorporate adaptation strategies where necessary to benefit people and the environment in Vermont, our region and the world."

  Brian Woods, the Climate Change Team's coordinator concentrates on Low Carbon Fuels and the Vermont Climate Cabinet, suggests the following resources:

  ◊ The 2010 Nature Conservancy Report Climate Change in the Champlain Basin
  ◊ Dr. Alan Betts, an independent researcher in Pittsford that has been working with Vermont ANR and UVM looking at in-state climate trends. His contact information is as follows: Dr. Alan K. Betts, Atmospheric Research, 58 Hendee Lane, Pittsford, VT 05763; (802) 483-2087; (802) 483-6167 (FAX); http://alanbetts.com/

◊ The ANR and Tetratech recently conducted a Climate Change vulnerability workshop. Talks from this workshop may be found online including Dr. Betts' talk on this website

◊ Vermont ANR's website has a section specific to the programs in place to adapt to climate change, and this page includes an overview of the challenges facing the State (including water resources), what programs are already in place, and what steps need to be taken next to continue adapting to climate change

Dr. Betts wrote the paper *Climate Change in Vermont* which may also be found on the Vermont Climate Change Team Website. This paper is part of the white papers being used by the ANR to develop an adaptation plan to climate change. Dr. Betts (personal communication, 2012) states that Vermont has not received 'normal' rainfall since 2002. He goes on to say that the temperatures predicted for Vermont for the next few decades are very similar to those trends [increasing temperatures] which we have experienced in recent decades; however, it is less certain what the effects of climate change will be on precipitation, and thus flow rates, in the Missisquoi and Trout Rivers. More flow in winter and an increase in precipitation, severe storms, and flow extremes are expected. These events will likely lead to increased frequency and magnitude of precipitation events, and more high intensity precipitation events but may also increase periods of drought as well.

Buffering against potential drought may be achieved by increasing soil moisture through maximization of precipitation infiltration area and retention time. Reduction of runoff by reducing or mitigating impervious surface, and managing runoff from lands adjacent to waterways (including agricultural lands) can also mitigate the consequences of increased precipitation events. Building flood resiliency is the main strategy of the state of VT as a response to climate change and the State's waterways. These strategies, in addition to reduction of fossil fuel emissions, are the types of opportunities for action in protecting water quality discussed below.

IV.b.iv.3.b. Current Protections for the Water Quality ORV:

Federal Protections

Clean Water Act

The Federal Clean Water Act (CWA) of 1972 is the over-arching statute that governs the quality of surface waters (lakes, ponds, rivers, streams and wetlands) in the United States. The Clean Water Act puts states responsible for monitoring surface waters, and reporting to EPA water reaches that don't meet the Vermont's Water Quality Standards (VWQS) set by the Water Resources Panel for water quality.

Section 404 of the CWA regulates, through the Army Corps of Engineers, addition of fill or dredged materials to waterways. Click here[8] to read the entire text of the CWA.

Resource Conservation and Recovery Act (RCRA)

The Resource Conservation and Recovery Act (RCRA) of 1976 addressed solid and hazardous waste management activities. A portion of the Act established the "cradle to grave" system, which governs the handling of waste from its point of origin to its disposal. RCRA is a federal statute, with oversight by the Environmental Protection Agency (EPA). RCRA relates to rivers mostly through the management of solid wastes produced from wastewater treatment facilities or drinking water treatment plants. The Act also contains provisions to protect groundwater from leaking underground storage tanks.

Superfund

Superfund is the federal government's program, through the U.S. Environmental Protection Agency

(EPA), to clean up U.S. hazardous waste sites. The Superfund cleanup process is complex. It involves the steps taken to assess sites, place them on the National Priorities List, and establish and implement appropriate cleanup plans (the long-term cleanup process). EPA's Superfund Program attempts to get interested parties and other stakeholders involved. Meetings and town votes were recently held in Lowell and Eden about the Vermont Asbestos Group (VAG) mine site and the potential for it being placed on the National Priorities List (NPL), commonly known as the Superfund List. The Towns of Lowell and Eden voted not to pursue Superfund involvement in cleaning up the asbestos mine at this time. This site was considered for inclusion due to the asbestos-containing sediments which could infiltrate and negatively impact waterways and wetlands, and thus potentially violate the Vermont Water Quality Standards and the Federal Clean Water Act. There are no sites in the Study area that are currently on the National Priorities List.

State Protections

Until recently, the Vermont Water Resources Panel (formerly the Water Resources Board) was the authority for the management and protection of Vermont's water resources. This Panel is under the Natural Resources Board along with the Land Use Panel which oversees Act 250 permitting and district environmental commissions.

Now, the Agency of Natural Resources exercises the authority for the management and protection of Vermont's water resources, including promulgation of Water Quality Standards[9] (VWQS) and Rules for the Use of Public Waters. The VWQS provide a framework for the protection and management of Vermont's surface waters per the federal Clean Water Act. The VWQS are a set of regulations that classify each water body, establish designated uses (such as swimming and fishing) that must be protected, and set criteria for chemical, physical and biological attributes of State waters that must be attained in order to protect the designated uses (please see the Water Quality Protections, Appendix 5, chapter of this Management Plan for more information on how the Missisquoi and Trout Rivers are classified).

Act 110

Act 110[10] was enacted by the Vermont State Legislature in 2011 (10 V.S.A. Chapter 49 and 24 V.S.A. Chapter 11) in order to place protections on river corridors and buffers. There were several reasons for this legislation, including maintaining the safety of waterways (such as mitigation of flood risk), protecting water quality, preserving habitat for fish and other aquatic life, regulating building sites to reduce flooding and property damage, and allowing for multiple uses of state waters for all Vermonters. The Act also promotes the protection of vegetated buffers along rivers, which help to prevent and control water pollution, aid in channel, bank and floodplain stability, reduce flooding, and preserve the habitat for both aquatic and terrestrial wildlife. Act 110 empowers municipalities to adopt bylaws to regulate zoning and development activity along river corridors, and adopt Best Management Practices (BMPs) for river corridor and buffer maintenance. Additionally, financial incentives are available from the State of Vermont to municipalities that adopt and implement zoning regulations protecting river corridors and buffers.

Act 138

Act 138 (2012) is an Act relating to regulation of flood hazard areas, river corridors, and stream alteration. Taken from the summary on the VT legislature website "This act authorizes the agency of natural resources (ANR) to adopt by March 15, 2014 rules for the regulation in flood hazard areas of uses exempt from municipal land use regulation. Adoption of the rules is intended to bring the state and participating municipalities into compliance with the Federal Emergency Management Agency's (FEMA's) national flood insurance program (NFIP). Beginning July 1, 2014, uses that are exempt from municipal land use regulations shall need an ANR permit if the use

occurs in a flood hazard area of a NFIP town. ANR may delegate to other state agencies permitting and enforcement of the flood hazard area rules. The act makes conforming amendment to municipal zoning authority to aid in state compliance with NFIP program. Prior to ANR adoption of flood hazard area rules for uses exempt from municipal land use regulation, the act provides that certain new facilities or activities shall be allowed in a flood hazard area only if they conform with FEMA's NFIP development requirements… The act clarifies ANR's authority over stream alteration… The act requires ANR to assess the geomorphic condition and sensitivity of rivers and identify those that pose a probable risk of harm to life, property, or infrastructure… The act requires ANR to report to the general assembly with recommendations on how to remediate and fund remediation of the water quality of state surface waters. The act transfers rulemaking authority for water quality, wetlands, use of surface waters, classification of waters, surface levels, and lakes management from the water resources panel to ANR."

Act 250

Act 250 is Vermont's development and control law. The law provides a public, quasi-judicial process for reviewing and managing the environmental, social and fiscal consequences of major subdivisions and development in Vermont through the issuance of land use permits. There are ten separate environmental criteria (with sub-criteria) that may cause a construction project to require issuance of an Act 250 permit, consequently making the project susceptible to both state and public review. Components of the permitting process include review of land use permit applications for conformance with the Act's ten environmental criteria, issuance of opinions concerning the applicability of Act 250 to developments and subdivisions of property, monitoring for compliance with the Act and with land use permit conditions, and public education.

Criterion 1 seeks to protect headwaters, floodways, shorelines, and wetlands of streams and rivers. It also protects waterways from the potential negative effects of improper wastewater disposal and stormwater runoff. In general, through Act 250, the State of Vermont seeks to implement 50-100 foot vegetated buffers for streams and rivers (depending on the size and year-round nature of water flow).

Criterion 1A, the headwaters provision, protects small streams and their shorelines above 1,500 feet in elevation.

Criterion 1B, addresses waste disposal (often septic systems) and stormwater runoff. Projects must meet Vermont Water Quality Standards and applicable health and environmental standards. Wastewater disposal sites along the Missisquoi and Trout Rivers could be covered.

Criterion 1D protects floodplains; it recognizes their importance both in preventing floods but also as significant natural communities. The Act 250 definition of floodways has expanded to include

Figure 43. After the flood: significant erosion and damage to fields at a farm in Westfield. *Photo by Shana Stewart Deeds*

Figure 44. A silver maple floodplain forest along the Missisquoi River in Westfield. *Photo by Shana Stewart Deeds*

flood corridors beyond the 100 year floodplain. This criterion seeks to protect the dynamic nature of these floodplains and has not granted permits for projects that seek to stabilize the shorelines of floodplains with rip-rap. Projects that significantly increase the peak discharge of waterways or endanger the health, welfare, or safety of the public and riparian owners are further cause to deny permits under Criterion 1D.

Criterion 1E protects streams. Streams are defined as "a current of water which is above 1,500 feet above sea level or which flows at any time at a rate of less than 1.5 cubic feet per second." Act 250 has applied this Criterion to other larger stream and rivers as well; typically the Criterion covers all rivers and streams. It is the intention of this Criterion that "the development or subdivision of lands on or adjacent to the banks of a stream will, whenever feasible, maintain the natural condition of the stream , and will not endanger the health, safety, or welfare of the public or of adjoining landowners."[11] Depending on site-specific conditions, 50-100 foot buffers between disturbed land and streams are typically protected.

Criterion 1 F protects shorelines. This provision seeks to maintain shorelines and shoreline vegetation in their natural condition, stabilize stream banks and prevent erosion, and continue to provide public access to waterways. Act 250 does not allow projects on shorelines unless it can be proved that the project cannot be located elsewhere and is dependent on the shoreline to fulfill its purpose.

Criterion 1G incorporates the Vermont Wetland Rules which protects wetlands and their functions and values. In general, VT wetlands are afforded a 50 foot protective buffer and most types of human development activities within that buffer area or the wetland itself require a state wetlands permit. Projects that require an Act 50 permit must also meet the requirement of the state wetland regulations. Act 250 can also seek to protect wetlands that are considered Class III and outside of the jurisdiction of the Vermont Wetland Rules. These

Class III wetlands may receive protection as well as a buffer that is generally at least 50 feet in extent.

Criterion 1A, 1B, 1D, 1E, and 1F collectively work to protect water quality through maintaining clean water, preventing shoreline and floodplain encroachments, and maintaining the public trust in Vermont's waters. Criterion 1G protects wetlands and vernal pools within the Wild and Scenic River Study area. These criteria collectively protect the physical, chemical, and biological integrity of the Missisquoi and Trout Rivers and their tributaries. ORVs that are focused on water quality including recreational use such as canoeing, swimming, fishing, and continued public access to the water are dependent on the continuing quality of the Trout and Missisquoi Rivers.

Criterion 4 addresses regulated construction activities with the goal of reducing soil erosion and helps maintain water quality.

This Criterion helps maintain the water quality that enhances and maintains ORVs such as swimming, fishing and scenic beauty.

Criterion 9 protects productive agriculture soils from conversion to development. In as much as the Missisquoi and Trout River landscape is dependent upon a healthy and vibrant farm economy, maintaining the agricultural land uses in the basin is important.

For more information on Act 250, please see the Act 250 chapter in Appendix 9, or contact your local District Coordinator.

Vermont Wetland Rules

Vermont has a specific set of laws regarding the protections of wetlands, knows as Vermont Wetland Rules.[12] Wetlands in Vermont are placed into one of three Classes: I, II or III. Most mapped wetlands in Vermont (as part of the National Wetland Inventory) are Class II wetlands. Class I Wetland designation is reserved for those wetlands that the Water Resources Panel determines are "exceptional or irreplaceable in their contribution to Vermont's natural heritage and merit the highest level of protection." Generally, the Vermont Wetland Rules require a 100 or 50 foot buffer zone for Class One and Class Two wetlands, respectively.

State Ownership

Big Falls State Park is the only state-owned property along the river corridor of the Wild and Scenic Study area.

Agricultural Protections

The State of Vermont has various regulatory and incentive-based programs which help farmers protect waterways. The Water Quality Protections section of Appendix 5 summarizes information about these programs. Generally, the "Division of Laboratories, Agricultural Resource Management and Environmental Stewardship (ARMES) regulates and registers pesticides, feeds, seeds and fertilizers, and administers the State's agricultural water quality programs including Accepted Agricultural Practices (AAPs), the Medium Farm Operations (MFO) program, and the Large Farm Operations (LFO) program. It also provides technical and financial assistance to farmers to implement Best Management Practices (BMPs) to insure compliance with these programs."[13]

Basin Planning

Water Quality Management Plans, formerly known as basin plans and the basin planning process are required by Vermont Statutes (10 V.S.A. §1253(d), VWQS §1-02D) and Federal regulations (40 CFR Part 130, §130.6). Basin planning falls under the Statewide Surface Water Strategy which focuses management, planning, regulatory and funding efforts on basin-specific stressors, which are identified and prioritized in a collaborative effort among all stakeholders – state and local governments, landowners, watershed associations and regional planning commissions. The Water

Quality Management Plan for the Missisquoi River is currently under revision, after the assistance of the Northwest Regional Planning Commission, and will likely be available for public comment in the fall of 2012.

Regional Plans (Non-regulatory)

The Northwest Regional Planning Commission's (NRPC) Regional Plan for 2007-2012 states that "The region's surface waters are its lifeblood," and goes on to state that lakes, rivers and streams should be "… appropriately respected, managed, enhanced, and preserved to ensure the future vitality of the region and its inhabitants." Water Quality Goals established in this regional plan include:

- 3.7 - To insure that present and future generations can enjoy a water cycle that yields fresh, clean, abundant water on and below the earth's surface.
- 3.8 - To protect the quality and quantity of pristine groundwater and surface water resources and to steadily improve degraded water resources.

Many policies are also listed regarding water quality including:

- 3.8 - Activities that threaten to pollute or deplete groundwater resources are not compatible with the region's water quality goals.
- 3.10 - State and local efforts to monitor water quality and quantity will be supported.
- 3.11 - Impacts of development will be considered from a watershed perspective, including incremental and cumulative impacts, and impacts between watersheds.
- 3.15 - Surface water quality should be protected and improved as opportunities arise.
- 3.16 - Surface waters should be protected from non-point nutrient loading with a variety of effective tools.
- 3.17 - Maintenance and expansion of vegetative buffers of sufficient width is encouraged as a tool for improving water quality.
- 3.19 - Contamination of surface and sub-surface waters by invasive non-native species is strongly discouraged.
- 3.20 - The use of surface waters for a variety of appropriate recreational uses is supported.

The Northeastern Vermont Development Association's (NVDA) Regional Plan (2006) states that "The overarching goal for the region is to balance local economic needs, while respecting the natural resources that we all enjoy. We fully support and encourage development that creates quality job opportunities for the citizens of the Northeast Kingdom. We feel any such development should consider the impact on:

- The quality and quantity of the region's surface waters.
- The quality and quantity of existing and potential groundwater resources.
- Significant wetlands within the region."

This regional plan includes water supply goals such as:

- Water supplies and water systems should not be contaminated, depleted, or degraded
- There should be sufficient quantities of water to meet existing and future residential, agricultural, commercial, industrial and recreational needs
- Strategies for the protection of water supplies and natural resources include:
- Supporting water conservation measures to reduce the demand for water and protect water supplies
- Assist interested communities to identify, map, and plan for the protection of surface and groundwater resources

- Provide public education on state and local water quality issues as they relate to local planning and development
- Discourage inappropriate development in flood hazard areas and floodplains. Support compatible land uses in flood areas, such as agriculture
- Encourage and assist communities to identify and protect community water supplies.
- Education on water conservation and resource protection should accompany these efforts.
- Support education efforts about significant wetlands and watershed protection

Town and Village (Local)

Town and village water quality protections are summarized in Table 6. Please see the *Water Quality Protections* Appendix 5 of this Management Plan for a more thorough discussion of water quality protections.

The Northern Vermont Resource Conservation and Development Program (RC&D) provides grants for programs which inventory and mitigate road related erosion problems through their Better Backroads program "Clean Water You Can Afford" (http://www.nvtrcd.org/bbr.html). Several of the Study area towns have utilized these funds, though none in 2011. In 2010 Enosburgh and Richford received grants (see the 2010 Report www.nvtrcd.org/2010_BBR_Report.pdf). Berkshire, Enosburgh, Lowell, Montgomery and Richford have received technical assistance site visits since 2005. This is a great program that offers funds for projects which improve the water quality of the Missisquoi and Trout Rivers.

Table 6. Water quality protection in local planning and zoning in Upper Missisquoi and Trout River Wild and Scenic Study area towns. **Montgomery is considering changes to their zoning bylaws which may include a setback.*

	TOWN PLAN	LAND USE REGULATIONS (ZONING & SUBDIVISION)				
Municipalities	**Water Quality Goals?**	**Require Preservation of Natural Resources?**	**Include Stormwater Mgmt Standards?**	**Reference ANR Stormwater Manual?**	**Include Flood Hazard Area Regulations?**	**Require Setback/ Buffer?**
Berkshire	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes (100')**
Enosburg Falls	**Yes**	**Yes**	**Yes**	**Yes**	**Yes**	**Yes (50-100')**
Enosburgh	**Yes**	**Yes**	No	No	**Yes**	**Yes (25-110')**
Montgomery	**Yes**	No	No	No	**Yes**	**No***
Richford	**Yes**	No	No	No	**Yes**	**No**
Jay	**Yes**	No	No	No	**Yes**	**Yes (50')**
Lowell	**Yes**	No	No	No	No	No
North Troy	**Yes**	**Yes**	No	No	No	No
Troy	**Yes**	**Yes**	No	No	No	No
Westfield	**Yes**	No	No	No	**Yes**	**Yes (50')**

Table 7. ORVs in the Water Quality category are covered by a variety of federal, state and/or local protections. This table contains a listing of Water Quality ORVs and the protection categories that pertain to each. For more information about water quality protections please see the following Protection Appendices.

Factors Contributing to the Water Quality ORV	Protection Categories			
	Water Quality	Historical	Natural Resource	Scenic and Recreational
Class "A" Waters	X		X	X
Macroinvertebrate Community Assessments	X		X	X
High Quality Biological Communities	X		X	X
Fish Community Assessments	X		X	X

IV.b.iv.3.c. Gaps in Protections for (Surface) Water Quality:

- There are decreases in the levels of acid deposition due to federal and state standards on fossil fuel combustion, but there is still a significant input of acid precipitation to the Study area. Reduction of fossil fuel use by our neighboring regions could significantly reduce this threat to the water quality of our Study area. Reducing local fossil fuel use can also improve air quality.

- Enforcement and stringency of current invasive species regulations could be improved

- Vermont has no set, specific, Statewide buffer requirement for vegetated buffers along waterways. There are recommendation; buffers are encouraged and there are financial incentives and assistance from the Vermont ANR to establish them. Specific, set buffer distances are not set presumably so that ANR can work with the towns to recommend buffers based on the conditions of the waterways in the town and the latest science. No towns in the Study area have taken advantage of the opportunities offered in Act 110 at this time (see the buffers discussion in Appendix 15)

- Best management practices (BMPs) are not required by the state in the realm of forestry or development, though there are typically acceptable practices which tend to afford minimal protections for water quality. Forest Watershed Programs Acceptable Management Practices (AMPs) presume that if these practices are followed, this should result in compliance with the Vermont Water Quality Standards

- Best Management Practices are not required on all farms; however Medium Farm Operation (MFO) and Large Farm Operation (LFO) farms are required to implement BMPs. The VAAFM has the authority to require a small farm to implement BMPs; however, there are not broad requirements for all SFOs to have BMPs. Accepted Agricultural Practices (AAPs) presume that if these practices are followed, this should result in compliance with the Vermont Water Quality Standards (Please see the protections appendix 5 for more on MFO and LFO regulations)

- Montgomery, Richford , Jay, Lowell, and Westfield do not have language in their town zoning requiring preservation of natural resources

- Most Study area towns (other than Berkshire and Enosburg Falls) do not have stormwater management standards in their zoning, and do not reference the ANR stormwater manual in their zoning

- Lowell, North Troy and Troy do not include flood area hazard regulations in their zoning, and Orleans County towns' Hazard Mitigation Plans have expired

- Richford, Lowell, North Troy and Troy do not have any required buffer in their town zoning

IV.b.iv.3.d. Opportunities for Action/Management Recommendations: Water Quality ORV:

The post-designation Wild and Scenic Advisory Committee could serve as a resource for communities, landowners and recreational users through education and outreach to ensure that these ORVs are preserved and well managed. The Committee may encourage the following actions:

Education and Outreach

≈ Highlight willing and interested farmers on the Wild and Scenic website that are using Best Management Practices (BMPs) in their agricultural operations

≈ Promote the value of vegetated buffers through education and outreach events; have examples of intact buffers on our website

≈ Help educate local residents about the River Corridor Management Program, established by the recently passed Act 110, which deals with the regulation of flood hazard areas, river corridors, and stream alteration

≈ Support projects which protect current wetlands, educate citizens on the importance of wetlands, and restore those with the greatest restoration potential (see the restorable wetlands fold out map at the end of this Management Plan)

≈ Encourage implementation of the Better Back Roads Program by the towns in Franklin and Orleans Counties

≈ Assist with river dynamics education, such as flume workshops, for all road crew employees in Franklin and Orleans counties

≈ Encourage efforts for river and water quality education in local schools

≈ Support efforts to educate landowners about reduced pesticide and fertilizer use, vegetated buffers to prevent erosion, removal of invasives and native plant landscaping. Educate landowners about provision 10 V.S.A. §1266b which regulates the application of phosphorus fertilizer to non-agricultural soils (or "turf") including the prevention of phosphorus fertilizer application to turf that is not deficient in phosphorus, to an impervious surface, to turf between October 15th and April 1st, to frozen turf, or to turf within 25 feet of state waters.

Local Planning

≈ Assist town and village planning commissions in the creation of priorities for water quality protection in their respective town plans, thereby giving towns regulatory power concerning development projects under Act 250

≈ Work with municipalities who may wish to adopt language in their town plans and zoning bylaws to regulate zoning and development activity along rivers, and adopt Best Management Practices (BMPs) for river corridor and buffer maintenance, encourage use of State financial incentives through Act 110 to adopt and implement zoning regulations protecting river corridors and buffers

◊ Support efforts by Montgomery and Richford as they review their town plans this year and work to include language for Fluvial Erosion Hazards and the National Flood Insurance Program,

encourage them to include this language in their bylaws during their next zoning review

◊ Support towns which adopt **at least** the minimum standards for buffers, setbacks, and National Flood Insurance Program regulations

◊ Provide assistance to close gaps in Phase I and II geomorphic assessments

≈ Encourage all towns to work with ANR and their regional planning commissions to have an up-to-date and approved Hazard Mitigation Plan. Orleans County plans have expired, which makes them less eligible for funding in a disaster. Montgomery and Richford are up-to-date. The status of the remaining Franklin County towns is unknown.

≈ Assist with communities who wish to petition the Vermont Water Resources Panel to increase the size of the buffer as well as limit the allowed land uses within a wetland and its adjacent buffer zone

≈ Help communities implement best stormwater management practices, such as Low Impact Development, to reduce erosion which carries sediment, nutrient and pollutant runoff to the Missisquoi and Trout Rivers and their tributaries

≈ Encourage hazardous waste and pharmaceutical disposal days at each transfer station in the ten towns and villages

≈ The progressive zoning districts implemented by Enosburgh and Enosburg Falls may be a good model for all the Study area towns; however, standardized buffers may be easier to understand and enforce

≈ Assist town and village planning commissions in the creation of zoning bylaws that protect water quality, especially in towns without such provisions in their town plans. Adoption of bylaws may include:

◊ Building and development setbacks

◊ Establishment or maintenance of vegetated buffers (at least the minimum of a 25-50 foot native vegetated buffer – see the gaps in riparian vegetation illustrated in the fold out map at the end of this Management Plan

◊ Low Impact Development techniques

◊ Agricultural, Development and Forestry Best Management Practices

Project Review

≈ Assist in review of large-scale development projects to help ensure erosion control techniques are utilized and maintained (including road construction)

≈ Maintain water quality and aquatic habitat and reduce thermal stress by encouraging appropriately designed and timed water withdrawals from the rivers, and only when necessary

≈ Work with VTrans to help implement sound river science in their decision making. Participate in NEPA and ACT 250 project reviews if designation occurs. Promote local and state construction and maintenance standards that limit road salt and sanding, increase the use of native vegetation buffers, protect riparian buffers and promote aquatic organism passage and reduced flood hazards

≈ Help the Vermont Department of Forests, Parks, and Recreation ensure the use of "Acceptable Management Practices (AMPs) for Maintaining Water Quality on Logging Jobs in Vermont"

≈ See Appendix 16 for a draft MOU for the Wild and Scenic Advisory Committee and FEMA; assist in efforts to update FEMA's reimbursement scheme after disasters to include improvements for flood

mitigation and water quality rather than just replacements

≈ The post-designation Wild and Scenic Advisory Committee and the NPS may draft an MOU, if designation occurs, and if desired by the relevant State agencies, such as VAAFM, to guide the Section 7 Review process

≈ Review development projects which may impact the water quality of the Missisquoi and Trout Rivers when applicable, including projects on high quality stretches and on those reaches listed as impaired waters on the annually updated 303d list available on the Water Quality Division's website

Volunteer Opportunities

≈ Support the volunteer water quality monitoring efforts of MRBA, through data analysis and other tasks, as part of the partnership between MRBA and the VT DEC Larosa Lab. Work with MRBA and VT DEC to address any gaps in Water Quality Monitoring; pursue solutions to fill in those gaps – perhaps help fund or work with local waste water treatment plants to provide *E. coli* testing and distribution of data at important swimming holes. Of note for MRBA to considering adding to or maintaining in their sampling schedule are those sampling sites of high quality – for example T-TJB (Jay Branch) and T-LBB (Burgess Branch), to continue to document any changes to reaches already listed as impaired – such as and T-NTMC (Mud Creek), and establish sampling sites on those not monitored which are listed as impaired but not sampled regularly by MRBA (Coburn, Berry, Godin, Samsonville and Trout Brooks)

≈ Partner with organization such as MRBA to co-sponsor tree planting events, and support their Trees for Streams initiatives and other riparian planting programs

≈ Partner with the Vermont Outdoor Guide Association (VOGA), if desired, which has an interest in creating an annual river cleanup event when rivers are generally low in August or September – a "Blue Up Day"

≈ Encourage efforts to restore native brook trout populations

Work with Private Landowners

≈ Encourage agricultural Best Management Practices like native vegetation buffers, reduction of bare ground corn plantings, reduction of tillage, increased use of aeration machines

≈ Help Agency of Agriculture, Food and Markets implement the Conservation Reserve Enhancement Program (with assistance from the USDA and NRCS) and similar efforts in Study area

≈ Encourage the development and use of approved forestry Best Management Practices in the state

≈ Help identify landowners who may be interested in creating Riparian Buffer easements

≈ Assist with implementation of the Missisquoi Basin Water Quality Management Plan, once completed, especially portions of the plan that influence ORVs in the Wild & Scenic Study area

≈ Encourage local landowners to enroll in the Use Value Appraisal (Current Use) program, a conservation measure that taxes land on its value for agricultural, natural resource and forestry uses rather than its development potential

≈ Support and educate landowners about Vermont Water Resources Panel, Agency of Natural Resources and Vermont Agency of Food and Markets regulations and voluntary programs. Promote Best Management Practices to reduce sediment, nutrient and pollutant inputs into and maintain healthy riparian areas for the Missisquoi and Trout Rivers and their tributaries including timing of manure spreading (especially avoiding spreading before rain and snowmelt) and use of the most current technologies such as manure injectors and aerators

Endnotes

[1]ANR. (2004). Basin 6 Missisquoi River Watershed Water Quality and Aquatic Habitat Assessment Report. Retrieved from www.vtwaterquality.org/mapp/docs/mp_basin6assessmntrpt.pdf

[2]Agency of Natural Resources, Draft Basin 6 [Missisquoi Basin Watershed] Water Quality Management Plan, dated November, 2012.

[3]Criteria for inclusion: Sites assessed (bio assessment) at least once in the last 15 years AND determined by VT ANR's Water Quality Management Division to be "Very Good" or "Excellent" as of the most recent sampling event. Designations presented here represent the most recent determination for the site as of the writing of this Plan. Data and assessment provided by Steve Fiske, 2011.

[4]EPA. (Last updated March 6, 2012). *Impaired Waters and Total Maximum Daily Loads.* Washington D.C. Downloaded July 18, 2012 from water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm

[5]Vermont Surface Water Management Strategy, Chapter 2: *Stressors* - www.vtwaterquality.org/wqd_mgtplan/swms_ch2.htm

[6]Vermont ANR, Water Quality Management Division Lakes and Pond Section's webpage: www.vtwaterquality.org/lakes/htm/lp_howwideabuffer.htm

[7]More ANR buffer resources: www.anr.state.vt.us/site/html/buff/BufferGuidanceFINAL-120905.pdf; www.anr.state.vt.us/site/html/buff/buffer-tech-final.pdf

[8]www.epa.gov/lawsregs/laws/cwa.html

[9]Full text of the Vermont Water Quality Standards: www.state.vt.us/nrb/wrp/publications/wqs.pdf

[10]VT DEC, River Management Program, Act 110 Summary Document: www.vtwaterquality.org/rivers/docs/rv_act110_rcmp_%20summary.pdf

[11]www.nrb.state.vt.us/lup/publications/manual/1efinal.pdf

[12]Vermont Wetland Rules, full text: www.nrb.state.vt.us/wrp/publications/VWR%207-16-10.pdf

[13]Vermont Agency of Agriculture, Food and Market's Division of Agricultural Resource Management and Environmental Stewardship: www.vermontagriculture.com/ARMES/index.html

Additional Resources:

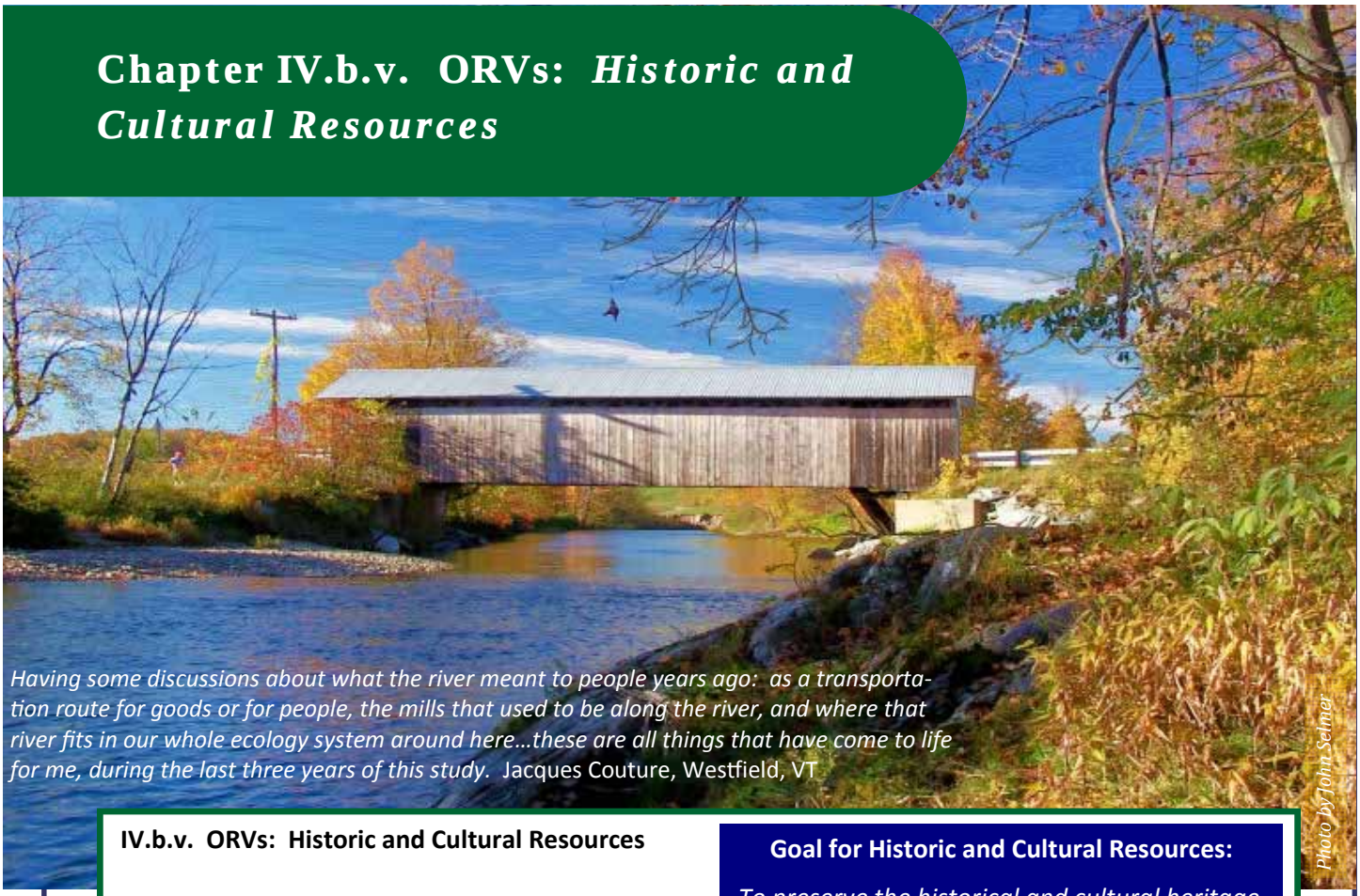
- Alan Betts, Vermont Climate Change Scientist: http://alanbetts.com/
- Environmental Protection Agency, 303(d) listing and TMDL process: water.epa.gov/lawsregs/lawsguidance/cwa/tmdl/index.cfm
- Environmental Protection Agency's Superfund Program: www.epa.gov/superfund/
- Lake Champlain Basin Program document *Opportunities for Action: An Evolving Plan for the Lake Champlain Basin*: www.lcbp.org/impofa.htm
- Missisquoi River Watershed Water Assessment Report (Vermont DEC, 2004): www.vtwaterquality.org/mapp/docs/mp_basin6assessmntrpt.pdf
- Montgomery's zoning bylaws: www.montgomeryvt.us/zoningregs1005.html
- Northeastern Vermont Development Association (Covering Orleans, Caledonia and Essex Counties): www.nvda.net/

- Northwest Regional Planning Commission (covering Franklin and Grand Isle Counties): www.nrpcvt.com/
- The Federal Clean Water Act: www.epa.gov/lawsregs/laws/cwa.html; Full text of Act: epw.senate.gov/water.pdf
- The Nature Conservancy Report *Climate Change in the Champlain Basin* (2010): www.nature.org/ourinitiatives/regions/northamerica/unitedstates/vermont/howwework/climate-change-in-the-champlain-basin.xml
- Vermont Act 110 (An act relating to establishment of an Agency of Natural Resources' river corridor management program): www.vtwaterquality.org/rivers/docs/rv_act110.pdf
- Vermont Act 138 (An act relating to regulation of flood hazard areas, river corridors, and stream alteration): www.leg.state.vt.us/docs/2012/Acts/ACT138.PDF
- Vermont Act 250 (Development and Control Law): www.anr.state.vt.us/dec/permit_hb/sheet47.pdf
- Vermont Act 250 Criterion 1E (regarding rivers and streams): www.nrb.state.vt.us/lup/publications/manual/1efinal.pdf
- Vermont Agency of Natural Resources, Department of Environmental Conservation, Watershed Management Division: www.vtwaterquality.org
- Vermont ANR's Climate Change website: www.anr.state.vt.us/anr/climatechange/Index.html
- Vermont DEC 2012 Integrated Water Quality Report: www.vtwaterquality.org/mapp/docs/305b/mp_305b-2012.pdf
- Vermont DEC Lakes and Ponds Section webpage on buffer widths: www.vtwaterquality.org/lakes/htm/lp_howwideabuffer.htm
- Vermont DEC Listing of Impaired Waters (303(d)) list: www.vtwaterquality.org/mapp/docs/mp_2012_303d_Final.pdf
- Vermont DEC Report on Biological Assessment Methods and Metric Calculations (2003): www.anr.state.vt.us/dec/waterq/bass/docs/bs_streamsaquaticlife.pdf
- Vermont DEC River Management Section: www.vtwaterquality.org/rivers.htm
- Vermont DEC Surface Water Management Strategy: www.vtwaterquality.org/swms.html
- Vermont DEC Watershed Planning: www.vtwaterquality.org/planning.htm
- Vermont Statutes: www.leg.state.vt.us/statutesMain.cfm
- Vermont Water Quality Standards: www.nrb.state.vt.us/wrp/publications/wqs.pdf
- Vermont Water Resources Panel: www.nrb.state.vt.us/wrp/index.htm
- Vermont Wetland Rules: www.nrb.state.vt.us/wrp/publications/VWR%207-16-10.pdf

Please see the Water Quality ORV fold out map at the end of this Management Plan.


Photo by Art Bell

Chapter IV.b.v. ORVs: *Historic and Cultural Resources*



Having some discussions about what the river meant to people years ago: as a transportation route for goods or for people, the mills that used to be along the river, and where that river fits in our whole ecology system around here…these are all things that have come to life for me, during the last three years of this study. Jacques Couture, Westfield, VT

Photo by John Selmer

IV.b.v. ORVs: Historic and Cultural Resources

IV.b.v.1. Overview of Historic and Cultural ORVs:

> *The upper valley [of the Trout River] is well supplied with water-powers that are utilized in grist-mills and the manufacture of wooden ware, shingles and lumber, whilst the lower is occupied by thrifty and industrious farmers who are content to dwell in their native vale and the homes of their ancestors.*
>
> **Elias Follett, 1891**[1]

There are many wonderful historic and cultural resources in Franklin and Orleans Counties, Vermont. The State Historical Society maintains the contact information for each society. Other publications, such as the 1878 Beer's Atlas also illuminate the history of the Study area. The rich history of Franklin and Orleans Counties includes both prehistoric and historic resources. This section identifies the historical and cultural resources most related to the upper Missisquoi and Trout Rivers and those that are Outstandingly Remarkable Values at the local, state or national level. The resources below are partitioned chronologically into prehistoric and archeological sites first, followed by historic and present-day cultural sites. The covered bridges in Montgomery, Enosburgh and Troy are significant historic and cultural ORVs featured below which are also considered scenic and recreational.

Goal for Historic and Cultural Resources:

To preserve the historical and cultural heritage of the upper Missisquoi and Trout River valleys by supporting efforts that maintain and restore prehistoric and historic sites and areas of cultural significance in the Study area towns, with a focus on those which are river related.

Native American/Prehistoric/Archeological

Though the history and recognition of Native Peoples in the Study area is hotly debated, there is no doubt that the Missisquoi and Trout Rivers were important to the first inhabitants of what is now known as Vermont. The name "Missisquoi" was given to the river by the native peoples, and is typically translated as "much water fowl." Due

to the transportation significance, fertility of the region, and rich fisheries, Vermont's rivers would have been invaluable to Abenakis. The Abenaki lived throughout the area that is now Vermont and New Hampshire. Around 1500 C.E., it is estimated that approximately 10,000 Western Abenaki were living in what is now Vermont, though recent estimates range much higher.

> *The history of this watershed is dense and deep, but only because of the nature of the benevolent river that supplied and transported the people who for so long lived alongside its waters.*
>
> **Bobby Farlice-Rubio, Museum Educator, Fairbanks Museum in St. Johnsbury**

The following description of the Abenakis' existence in the Missisquoi and Trout River valleys was written from notes taken at a talk by the museum educator, Bobby Farlice-Rubio.[2] The Missisquoi River valley was a crossroads for native peoples as early as 12,000 years ago, and an important transportation corridor. Commerce and trade would have followed the Missisquoi, especially along the Northern Forest Canoe Trail (NFCT) route. These river valleys were suitable for settlement for thousands of years. Part of what makes this region valuable to prehistoric peoples is the chert, used like flint to make stone tools. Birch, which grows plentifully in the region, was also utilized for making canoes. It is likely that the majority of settlement in the upper Missisquoi and Trout River regions consisted of temporary structures utilized while fishing. This area would have been a major fishing destination for native peoples. Temporary weirs made of wood and other plant material would have been set up to catch fish. Crops would also likely have been planted in the fertile areas near floodplains and oxbows.

There is verified evidence of seasonal Native American hunting and fishing camps along the Missisquoi and Trout Rivers, but year-round dwellings in the Wild and Scenic Study area have not been documented. Settlers found no evidence of cleared agricultural land, permanent dwellings or settlements when they arrived in this area. It is likely that Native Americans came to the area near the Upper Missisquoi and Trout Rivers for periodic fishing and hunting expeditions but lived further downstream, closer to Lake Champlain. Evidence of a large Native American village and early graves of Woodland People have been found at the Missisquoi River in Swanton, VT. According to Bobby Farlice-Rubio Museum Educator at the Fairbanks Museum in St. Johnsbury, "the Missisquoi River was the transportation, agricultural, and aqua-cultural backbone of the powerful Abenaki city known as *Mazipskoik* (In Swanton, VT just outside of the Study area). From the banks of this river, the legendary Abenaki leader Grey Locks (*Wawanolewatt)* launched his notorious and consequential raids on new English settlements in Western Massachusetts. On the banks of this river, Christianity stepped into Vermont when this State's first Christian church was built by Abenakis and French Jesuit missionaries at the beginning of the 18th century. The history of this watershed is dense and deep, but only because of the nature of the benevolent river that supplied and transported the people who for so long lived alongside its waters. For the thousands of years of history prior to European colonization, the flow of fish from Lake Champlain, upstream and over waterfalls on the Missisquoi to ideal spawning grounds would have been as vital to surrounding Abenaki communities as the flow of blood is to the human body. All forms of important mammals and birds too, from moose to mergansers, use the resource of the river as the focal point of their seasonal routines. As far as promoting the general health and vitality of a forested and wetland ecosystem, the Missisquoi and Trout Rivers are the most important pieces of the biological "infrastructure" in the valley." According to Douglas Frink, a consulting archeologist for the State located in Westford, VT, "the one common denominator to most prehistoric sites in the northern upland regions of Vermont…is the association with water." He goes on to say that "rivers provided the primary transportation networks between watersheds, waterfalls and rapids along major rivers as well as

upland ponds provide choice procurement zones [presumably for food], upland springs and small streams provided short term seasonal procurement sites, and the lands near the confluences between rivers and between rivers and major lakes were primary locations for large sites and major villages."[3] Though there does not seem to be a major Native American settlement within the Study area like there was just downstream in Swanton, the Missisquoi and Trout Rivers would have been important for transportation and hunting/food procurement, and thus may still hold archeological evidence yet to be uncovered.

The population of Western Abenaki began to decrease with the arrival of other Native American peoples and later Europeans. Lake Champlain and what would become Vermont was a "great thoroughfare of the French and English colonies and their Indian allies in the almost incessant wars with each other."[4] Many Abenaki married into colonist families and assimilated. This became especially pronounced during the Vermont Eugenics Surveys of the late 1920s which included Abenaki families. By the late 1700s, as European settlement was becoming widespread in Vermont, there were few who identified themselves as Native American remaining in the Study area. Because some hid their identity as Abenaki to prevent discovery, persecution and sometimes sterilization by the eugenics movement, the fight to be recognized by the State of Vermont has taken decades. In 2011 and 2012 the State of Vermont officially recognized four tribes of the Abenaki (the Abenaki at Missisquoi, the Elnu Abenaki Band, the Koasek Traditional Band of the Koas Abenaki Nation, and the Nulhegan Abenaki Band) as Native American Indian Tribes. The laws enacted to recognize the tribes also established a

Focus on ORVs: Archeological Sites

The Vermont Archeological Inventory and subsequent Environmental Reviews have uncovered several archeological sites in the Study area. Information on these sites may be found in the Vermont Division of Historic Preservation's archives at the National Life Building in Montpelier, VT. Native American Site VT-FR-162 is in Enosburg Falls. There is evidence here of a large camp or village based on the low density of prehistoric artifacts (early to middle Woodland Period) over a large area. Chert and quartz flakes, fire-cracked rock, charcoal, and hearth features were found. According to the Division of Historic Preservation VT-FR-162 "is important in that it is at present the largest known site on the Missisquoi above Enosburg Falls. It is probably a Woodland Period camp/village site which was not intensely used. This suggests it could be…a sensitive temporal marker if dated…"

The major threats to these sites include: lack of inventory and assessment, erosion and collection. This site, near the falls, is adjacent to and actively eroding into the Missisquoi River. There are likely more sites of archeological significance along the Missisquoi and Trout Rivers that have not yet been discovered. Most of the archeological surveys in this area are completed when there is an impending development project which falls under Section 106 review. Landowners may not report finding artifacts in order to prevent review of their properties, or avoid a slowdown of proposed development. Some of the records in the Vermont archives indicate that artifacts are only found after sites have been disturbed, and the significance of the site may be diminished at that point. Finally, there are some individuals who seek to collect prehistoric artifacts. For this reason, and to protect the sites on private lands, archeological sites have only been identified vaguely, typically at the town level. More information about these sites may be found in the VT State records in the archives, as well as a list in the Vermont Rivers Study published in 1986.[5] The chart on page 109 lists archeological resources of moderate to high sensitivity along the Missisquoi and Trout Rivers as well as tributaries including Dead Creek, Hungerford Brook, McGowan Brook, Black Creek, Saint Rocks Brook, Fairfield River, and Tyler Branch.

Vermont Commission of Native American Affairs, made up of seven Native Americans.

Opportunities for Action: Archeological Sites

The post-designation Wild and Scenic Advisory Committee could serve as a resource for communities, landowners and recreational users to ensure that these irreplaceable sites are identified, and provide education and outreach opportunities ideally in cooperation with local bands of Abenaki. The Committee could encourage some of the following actions:

≈ Identification of sites could be aided by supporting test pit surveys. With so much river-related activity by Native Peoples, this is a better way to identify potential archeological sites, and is more reliable than surface collection

≈ Education of the public about the rich history of the Missisquoi and Trout Rivers through, perhaps, a guide, written in conjunction with the VT Division of Historic Preservation and the Abenaki bands, about the Abenaki activities in the upper Missisquoi and Trout River valleys

≈ Add a written description to one of the Northern Forest Canoe Trail (NFCT) kiosks describing the Abenaki activities in the region

European Settlers/Historic/Covered Bridges

European discovery of Lake Champlain in 1609 marked the beginning of migration of European settlers into Vermont; however, it wasn't until the early 1790s that the first Europeans began to establish year-round settlements in the Study area towns. Early settlers initially cleared land for farming, with dairy farms soon becoming most prevalent. By the mid-1800s, most area forests were cleared and agricultural land was the predominant feature of the landscape. The Town of Berkshire alone had over 150 dairy farms.[6] Most area farmers

Figure 45. Historic Photo of the Missisquoi River in East Berkshire, year unknown. *Photo courtesy of John Weld, Berkshire Historical Society*

Figure 46. A paddling break: stopping along the river for fresh cheese at the Boston Post Dairy Country Store. *Photo by Shana Stewart Deeds*

were involved in secondary agricultural activities in addition to farming, including maple sugaring, apple cider production and cattle breeding. Alternatively, some farmers had secondary income outside of agriculture – ministers, lawyers, doctors, blacksmiths, wheelwrights and carriage makers were all common second professions. Logging and milling also became part of the working landscape. Despite needs for numerous goods and services associated with the growing population, dairy farming still provided the economic base for the area. This cultural heritage is still celebrated today at the annual Vermont Dairy Festival in Enosburgh, the "Dairy Capitol of the World". This festival, sponsored by the Enosburgh Lions Club, is held the first weekend in June.

As populations in the towns enlarged and the need for building products increased, many logging mills were created along the rivers, most of which were powered by water using small dams. The rivers and streams were used to not only power mills but also to transport logs. The Missisquoi was important for the transportation of wood products. Jacques Couture, Westfield, VT, recalls a former employee of the Brown Paper Company, now deceased, who discussed the process of traveling to farms along the Missisquoi River during the winter months to measure and pay for wood that farmers would cut and stack on the river banks. In the spring, when the ice melted, crews of men would conduct log drives to float the wood to the paper mills and sawmills downstream.

In Westfield, water power from the tributaries (Mill Brook, Taft Brook, Snider Brook) was used for a potato starch mill and several sawmills that operated for many years. In Montgomery, the need for wood

Vermont Senate Resolution 118:

Recognizing June 2 through June 5, 2005, as the Vermont Dairy Festival..."Whereas the Vermont Dairy Festival is a beloved expression of the civic pride and agricultural heritage of the people of Enosburg Falls and Franklin County, Vermont; whereas the people of Enosburg Falls and Franklin County have long-held traditions of family owned and operated dairy farms.

Vermont Dairy Festival at
The Dairy Center of the World

Focus on ORVs: Longley Bridge

This bridge, Vermont's longest covered bridge, is one of the six covered bridges still *in situ* in Montgomery. It was built in 1893 by Sheldon and Savanard Jewett, and is located 1.1 miles east of the village on Longley Bridge Road over the Trout River.[9] These brothers operated a mill on West Hill where they milled the lumber for the bridges.[7] This spot is not only appreciated for its history and beauty, but also for the swimming hole beneath. The Montgomery Historical Society's write-up on the bridges lists Montgomery as Vermont's "Covered Bridge Capital."[10] These bridges were built of necessity to access harvestable timber, and allow for the removal of timber, and transport of farm goods.

Threats to covered bridges include:

- larger roads
- heavier vehicles
- expensive upkeep
- safety concerns
- flooding events

Figure 47. Photograph of the current condition of the Longley Bridge, Montgomery, VT. *Photo by Shana Stewart Deeds*

products gave rise to small villages around dams and mills on the Black Falls Brook, Trout River, South Branch of the Trout River, Hannah Clark Brook and Wade Brook. In addition to the harvesting of building timber, the Nelson and Hall mill at the intersection of today's Routes 58 and 118 on Wade Brook in Montgomery Center boiled logs for veneer processing. Veneer production also occurred in North Troy and Enosburgh/Enosburg Falls. Other dams in Montgomery included Hutchins (Route 118, South Branch Trout River), Black Falls, and in Montgomery Village (Comstock Bridge Road, Trout River). Such a thriving forest product economy in Montgomery created a need to be able to navigate around the Town despite the numerous streams. As a result, 12 separate covered bridges were built to provide access to tree harvesting areas and provide transport of timber over the roads. Six of these covered bridges, all built by the same family – the Jewett Brothers – are still standing, and are in use today (*Montgomery Historical Society*).[7]

Featured ORV: Covered Bridges

Covered bridges are a sought-after recreational attraction for people interested in cultural heritage and scenic beauty. Early settlers in the Study area were fortunate to have ample forest and farm land, as well as plentiful running water, to power mills and transport forest products. The waterways created a separate challenge for overland travel; a growing economy and an abundance of rivers and streams in the area created the need for many bridges. The bridges were built with roofs to shield them from the elements – rain, ice, and lots of snow. Twelve covered bridges were built in the Town of Montgomery alone, all by the same builders – the Jewett brothers. These bridges are so important that Montgomery's 2010 Town Plan stated a vision for the future of Montgomery was to "maintain and preserve Montgomery's six covered bridges, for they represent our community's history and an appreciation of Vermont's cultural heritage." By 1940, there were 13 bridges in Montgomery. The president of the Montgomery Historical Society, Scott Perry, states that these bridges were often built to provide access to more trees for harvest. Six of these covered bridges are still in use today and one (Hectorville Bridge, from Gibou Road) is currently in off-site storage awaiting repair. This

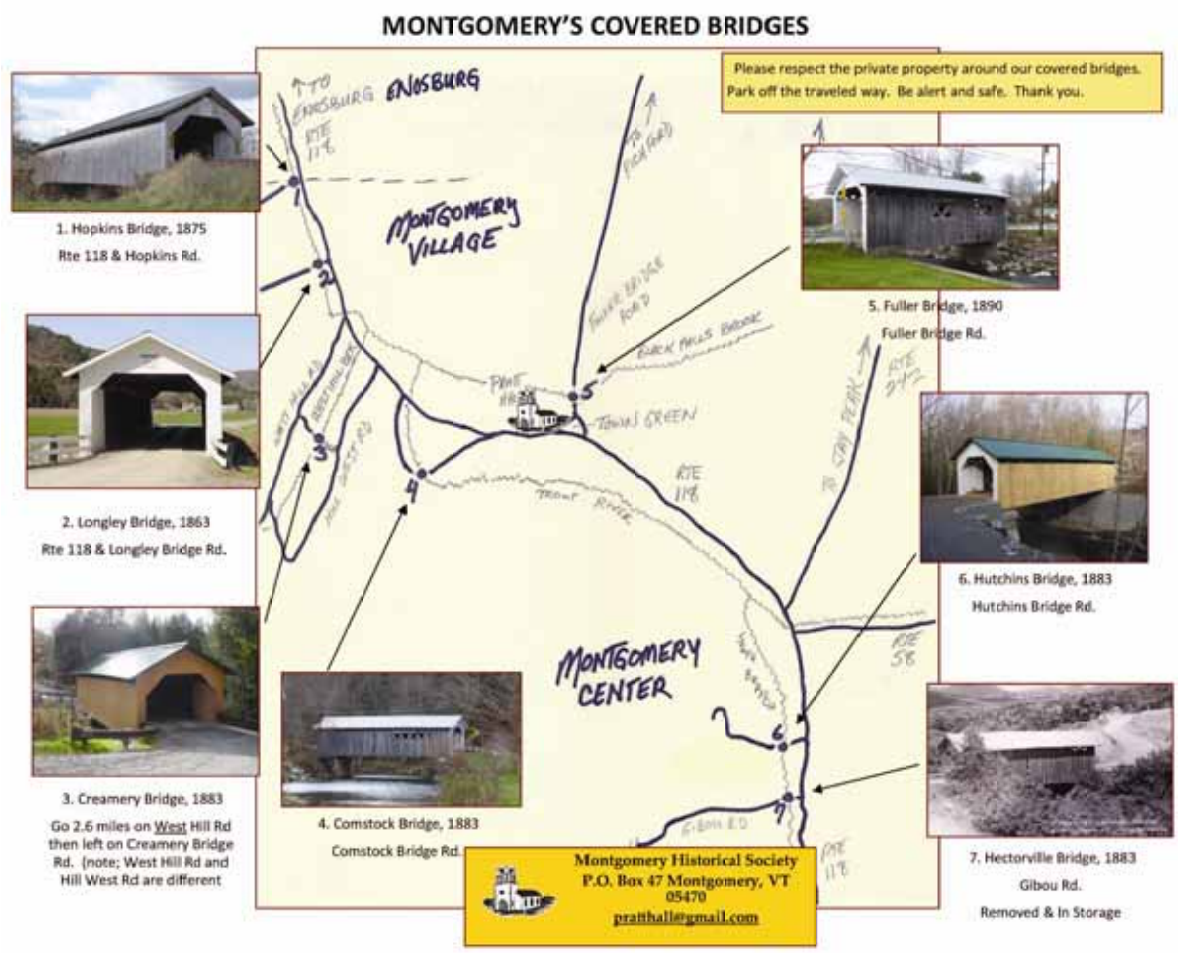


Figure 48. Graphic by the Montgomery Historical Society of the seven Jewett Brothers covered bridges in Montgomery, VT.

represents the most covered bridges within one Town in the country.[7] The six Montgomery bridges, as well as one in Troy and another in Enosburgh, are popular destinations for sightseers and bring many tourists to the area. These bridges add to the unique local character and quaint New England Charm of the Study towns. The bridges are documented online.[9] All of these covered bridges were listed on the National Register of Historic Places between November 1974 and December 1974.[8] As such, these bridges are recognized as significant at the community, state, and national level. Some protection is afforded through being listed, predominantly through the limitation of adverse effects caused by federally funded or permitted projects. Sites on the State Register are reviewed under Criterion 8 of Act 250. Approval for projects in the State Register should be reviewed by the VT Division of Historic Preservation whenever possible to avoid undue adverse effects on these historical resources (see the Historic and Cultural section in the Appendix 6 for further discussion on these protections).

Opportunities for Action: Covered Bridges

The post-designation Wild and Scenic Advisory Committee could assist Enosburgh, Montgomery and Troy in the management of their covered bridges. The Committee could encourage and serve as a resource on the following actions:

≈ Currently the Longley Covered Bridge is unusable. There is a temporary metal bridge for vehicular

traffic. Work with VTrans get this bridge on the VTrans Priority Project List for restoration.

≈ Work with the Montgomery Historical Society to promote the protection of these bridges, and ecotourism events that highlight these bridges.

≈ Investigate costs and options to restore the Hectorville Bridge either back on site on Gibou Road, or nearby as a pedestrian bridge and historical attraction with interpretive information about all of Montgomery's covered bridges.

≈ Look into support for a Covered Bridge Festival, to include possible photography and biking tours of the Study area covered bridges.

≈ Work with VTrans to develop a comprehensive approach to preservation of all of the covered bridges in the Missisquoi & Trout Study area.

Contributing to Historic and Cultural ORV: Community Heritage - Agriculture, Milling, Logging and other Historic Sites

The Study Committee found that our communities cherish our rivers and surrounding valleys for a variety of values including their rural character, traditional way of life, agricultural heritage, and diverse history. The Study Committee found a strong desire among a wide diversity of people to preserve these attributes that contribute to the character of the river valleys and the quality of life in the region including the working landscape, healthy farms and forests, good water quality, vibrant communities, and recreational opportunities. The historic and cultural heritage of the Study area includes a diverse and rich history of land use including agriculture, milling and logging which were, and continue to be tied directly to the Rivers.

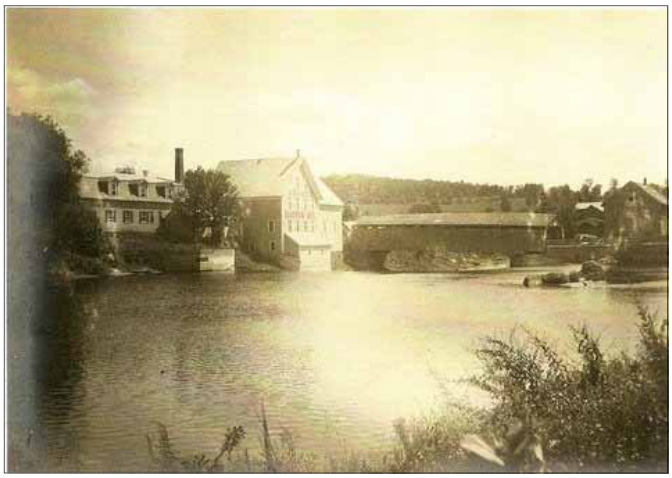


Figure 49. The Missisquoi Flouring Mill (known locally as "The Grist Mill"), built in 1877, and the adjacent Owl's Head Creamery at Enosburg Falls. Both buildings were destroyed by fire in 1915. *Photo Courtesy of the Enosburgh Historical Society*

In the 1700s most Vermont families lived on self-sufficient, small farms meant to sustain the family. In the 1800s sheep were introduced and helped farm families raise income from their farming activities. In the mid-1800s dairy farming began to overtake sheep farming as Vermont's primary agricultural industry, and continues today; however, Vermont's farms continue to diversify. Vermont farmers produce the most maple syrup in the nation, and the cheese, milk, apples, vegetables and meat that used to sustain only the farm families now is sold through farmer's markets and Community Supported Agriculture shares.

Clearing of farmland, around 80% cleared at the height of farming in the State, supported a logging boom. Today the logging industry remains important in the State. The heritage of logging may be seen in sites such as Ring Rock, Enosburg Falls. This was a ring through which rope was pulled to catch logs as they were floated down the Missisquoi. As stated in the *Historic* section above the Missisquoi was an important transportation corridor for lumber. Logging, grain and textile mills grew up along the Rivers as towns enlarged and industry increased.

The Wild and Scenic Study Committee recognizes the need to maintain high water quality in the region while also maintaining a working landscape of business and industry (including agriculture, logging, tourism, and recreation). Clean waterways support the economic viability of the region when maintained with good economic and ecological

practices. The co-existence between the working landscape, water quality and natural heritage is an on-going, active and collaborative effort among many invested partners. The Committee applauds the work of groups such as the Farmer's Watershed Alliance and their mission "to insure environmentally positive solutions and enable the dairy industry through education and funding to better the soil, air, and water of the Lake Champlain Watershed while remaining economically viable," along with the ongoing efforts of the Vermont Agency of Agriculture Food and Markets to protect water resources while maintaining the viability of farming. Agriculture is discussed further in the water quality ORV and protections chapters of this Plan.

List of Historic and Cultural ORVs by Municipality:

Historical evidence found in the Vermont Division of Historic Preservation's archives at the National Life Building in Montpelier, VT.[11] Most information in these archives comes from Archeological Review, Environmental Review, or listing on the Vermont State Register of Historic Places:

Table 8. List of Historic Sites in the Enosburg Falls Historic District.[4] The Enosburg Falls Historic District borders the Missisquoi River. It has over 15 sites on Vermont State Register of Historic Places, and several on the NRHP.

Enosburg Falls Sites	Historic District	State Register #
Aseltine & Greenwood Block	Downtown	0603-13
Dr. A.J. Darrah House	Downtown	0603-10
Enosburg Falls High School	Downtown	0603-20
Enosburg Falls National Bank	Downtown	0603-11
Masonic Hall	Downtown	0603-15
Merrill Block	Downtown	0603-14
Methodist Church	Downtown	0603-19
Northern Telephone Company Building	Downtown	0603-3
Old Post Office	Downtown	0603-16
Perley Block	Downtown	0603-12
Silver Auction House	Downtown	0603-17
B.J. Kendall House	North Main St.	0603-6
Carmi Marsh House	North Main St.	0603-4
Dr. William Hutchinson House	North Main St.	0603-8
Kendall's Spavin Cure Building	North Main St.	0603-1
Moses Perley House	North Main St.	0603-5
Olin Merrill House	North Main St.	0603-9
Original Spavin Cure Building	North Main St.	0603-7
Catholic Church	Railroad	0603-18
Opera House	Railroad	0603-2

Berkshire:

- No Vermont Archeological Inventory sites listed in Berkshire.
- The East Berkshire Historic District is listed on the VT Historic Sites and Structures Survey and is potentially eligible for listing on the National Register of Historic Places (NRHP).

Enosburgh/Enosburg Falls:

- Native American Site VT-FR-162 – See description above.
- Native American Site VT-FR-305 – chert flakes were discovered. This site is set back from the river, and likely will not yield significant additional artifacts according to the State review.
- Native American Sites VT-FR-331– VT-FR-333 combined are one of the few known archeological sites on the upper Missisquoi River. Artifacts at this site are few, and likely indicate a small, short-term hunting camp. Artifacts are likely from Paleoindians (9000-7000 B.C.E.) or middle Woodland peoples (1-1000). This site is currently protected by the 100' Vermont wetland buffer, and may be eligible for inclusion on the National Register of Historic Places. In phase two assessment, protection by geotextile fiber was recommended along with seeking inclusion on the NRHP.
- **Covered Bridge**: Hopkins Bridge, Hopkins Bridge Rd., Enosburgh (also a Jewett Brothers bridge added to the NRHP 1974). Hopkins Covered Bridge is in Enosburgh near the Enosburgh/ Montgomery town line. According to Scott Perry from the Montgomery Historical Society the fact that it was also built by Montgomery's Jewett brothers and its closer proximity to downtown Montgomery Village than Enosburgh lead them to "claim" it for Montgomery.
- Town Highway **Bridge #12** (Boston Post Road) over the Missisquoi (added in 2007 to the National Register),

Please note that the information below for Enosburgh/ Enosburg Falls came from the Enosburgh Historical Society's book.[4] *Those sites included below are/were along the Missisquoi River. Table 8 gives a current list of sites still standing in the Enosburg Falls Historic District.*

- ◊ VT Historical Gazetteer (1871) reports that Enosburg Falls contained a woolen factory, saw & grist mills, planing machines, 3 carriage shops, tanner, 3 stores, 1 harness shop, 1 tin shop, 2 blacksmith shops, 1 shoe shop.
- ◊ Round mill at Kidder's hole (Tyler Branch) was the first or a very early mill in Town. There was a cider mill on first floor, saw mill on ground & upper floors, and a carriage shop where wagons & sleighs were made. This was torn down in the 1940s. The falls on Tyler Branch are significant because they provided power for these industries.
- ◊ The first mills on the west side of Town were built by Judge Fuller who came to Enosburgh in 1821 & built several mills: saw mill (1823), grist mill (1824), upper stone grist mill (1836).
- ◊ Around 1825 Samuel Stone built a grist mill, planing machine and cheese box factory along the "upper falls" in Sampsonville (an area located on the northern part of Town). A wooden dam was built there around this time as well. Later Dennis Sampson started a starch factory and cloth mill. Businesses later deteriorated and only one mill was left by 1883.
- ◊ In 1915 a veneer mill was built; logs were floated down the Missisquoi to the factory. This veneer facility was the "largest and most completely equipped veneer mill in Vermont, possibly New England" until fire burned the mill down in 1918; it was never rebuilt. The wooden dam was replaced with concrete around 1900, but it has since washed away and only a small part remains.
- ◊ An electric mill was built in the basement of the saw mill which was transitioned into a grist mill and then into a new hydroelectric plant. In 1936 the hydro plant was sold to the Village of Enosburg Falls and still produces electricity today.

Montgomery

- All of Montgomery's existing covered bridges which were listed on the National Register in 1974. These bridges are the Comstock Bridge, Fuller Bridge, Hectorville Bridge (in storage), Hutchins Bridge, Longley Bridge, and West Hill (Creamery) Bridges (please see the *Scenic/ Recreational ORV* section of this Plan for more information). They represent, according to archive records, the "most extensive surviving record of the work of any individual covered bridge builders who practiced their trade in Vermont." Mr. Henry goes on to say that covered bridges in Vermont "…are among its most cherished and symbolic historic resources."[12] Vermont is the State with the highest concentration of covered bridges in the U.S. The VT DHP sought listing on the NRHP in order to protect covered bridges which were threatened.

- **Covered Bridges**

  ◊ Comstock Bridge, Comstock Bridge Rd., Montgomery

  ◊ Fuller Bridge, Fuller Bridge Rd., Montgomery

  ◊ Hectorville Bridge, Gibou Rd., Montgomery (currently in off-site storage awaiting repair)

  ◊ Hutchins Bridge, Hutchins Bridge Rd., Montgomery

  ◊ Longley Bridge, Longley Bridge Rd., Montgomery

  ◊ West Hill (Creamery) Bridge, Creamery Bridge Rd., Montgomery

- The Longley Bridge Farm was listed in the Historic Sites and Structures Survey (completed in the 1980s) as a good example of a classic Vermont farmhouse located on the Trout River, and of State significance.

Figure 50. Comstock Bridge, Montgomery, VT. *Photo by Ken Secor*

- There are no Archeological Inventory sites listed in Montgomery; however, according to the archives, there may be moderate archeological potential along the Trout River in Montgomery. Lack of evidence may simply be due to the fact that little sampling has occurred in the Trout River area. Three quartz flakes, likely of Native American origin, were uncovered during review for the replacement of the Montgomery water system. These were not considered significant findings. It is suggested that continued care be taken when activities occur along the river in order not to disturb archeologically sensitive areas. The VT DHP recommends further assessments in the Trout floodplain.

- Montgomery Center and Village have Historic Districts on the Vermont Historic Sites and Structures Survey. Both of these are along the Trout River.

Richford

- VT-FR-156 and 157 – Archeological evidence (chert flakes and quartz fragments) from the early Woodland period (500 B.C.E.). Middle to late Woodland sites are expected in Richford, but since early Woodland residents were lower in the watershed closer to Lake Champlain, early Woodland evidence in Richford is rare. Because of the research value inherent in refining

movement of early Woodland occupants, this site may be eligible for the NRHP.

- VT-FR-227 – The Richford Lime Kiln, located on the north side of the Missisquoi River, is eligible for inclusion on the VT Register of Historic Places. The lime industry was important in Vermont for 100s of years, and this site is a good example of evidence from the industry in the 1800s.

Jay

- No Archeological Inventory sites listed in Jay.

Lowell

- No Archeological Inventory sites listed in Lowell.

- The Tillotson Camp is a Long Trail shelter built in 1939 (original shelter constructed in 1929). This camp, according to the Section 106 review for repairs completed in 2006, is "historically significant, statewide and nationally, because it is associated with the early history of the Long Trail and with the Green Mountain Club member volunteers who worked to create and maintain the historic trail and trail shelter system."[13] The trail is also "…a pivotal act in the development of hiking and other wilderness activity in the U.S." Though on the summit of Belvidere Mountain, this site has views of Burgess Branch and the Missisquoi River.

- Information on mills along the Missisquoi River and its tributaries in Lowell provided by Sam Thurston of the Lowell Historical Society:

  ◊ The Missisquoi River and its tributaries were used for power for mills and later for a log holding pond for lumber mills. In Lowell, there are two site remains on Burgess Branch just below Kempton Hill Bridge. Regarding the larger one (closer to the bridge) oral history states it was a rake tooth mill. The configuration of the remains suggests that water (via a sluice) powered an overshot mill wheel. The smaller mill (approx. 500 feet downstream from the first site) also suggests an overshot wheel via sluice. Oral history states it was a starch mill. Dates of operation have not been determined, but mill wheels predate steam.

  ◊ Off the Mines Road, a site can be seen on Lockwood Creek (which flows into the Burgess Branch) of remains of a dam for the log holding pond for the Warner sawmill, which closed about 1944. Years later, a new, smaller mill was built which remains to this day. Some of the storage buildings for the original mill remain. This mill was powered by steam.

  ◊ In 1914 (referencing the Sanborn Fire Insurance map of that year) there were three dams in Lowell Village. Evidence of the Silsby Mill remains on the northern edge of the Town; this large mill closed about 1926 (before the 1927 flood). The map states the power was steam and water. Also there were two dams on the river just west of the bridge in Town, one by the blacksmith shop (the large building still remaining) and one by a woodworking, cider and feed mill.

Troy/North Troy

- Old Iron Mine, Troy, VT. This iron mine gorge has powerful falls, and was called the "Old Iron Mine" by folks that went fishing there.

- VT-OL-3 is the site of the Troy Blast Furnace. Though the furnace is in relatively poor condition, the site has been relatively undisturbed according to the archives' records, thus making this site potentially eligible for the NRHP. The State suggests further excavation for study to better ascertain the iron making technology in Vermont in the 1830s and 1840s. This site contains a flume running to the river. This is along the Missisquoi River at the base of the third gorge (on river right) on the east bank of the river a mile and a bit

below Mariner's home. It has a smelter chimney. There are chunks of iron slag in the immediate vicinity.

- A single green-gray chert flake was discovered at VT-OL-5, but no additional prehistoric evidence was recovered.

- VT-OL-6 yielded several projectile point fragments and one whole point of unknown prehistoric origin. There is speculation that this may have been a larger village site.

- VT-OL-27 is also along the Missisquoi River, and was identified as a Native American site by the presence of a lithic flake.

- The North Troy Historic District, eligible for NRHP listing, was surveyed by a Historic Preservation Specialist in the 1990s in order to determine whether a dam repair project to the North Troy Hydroelectric Dam would have adverse effects. It was determined that there would be no adverse effects from the repairs. Historically, this site was a mill complex: Josiah Elkins' saw and gristmill in the 1800s later the site of a Veneer company and eventual hydroelectric facility, T.J. Sartwell's woolen factory from 1859 until it was also absorbed by the hydro facility, Eastman's Machine Company and Foundry in the late 1870s which manufactured butter tubs among other necessities, and finally the O.P. Hadlock flour and gristmill.

Figure 51. River Rd. Covered Bridge over the Missisquoi River in Troy, VT. *Photo by Shana Stewart Deeds*

- **Covered Bridge:** River Road Bridge (Upper Bridge), River Rd., Troy (added to the NRHP 1974, the only NRHP site in Orleans County within the Study area)

Westfield

- There are several structures on the Vermont State Register in Westfield the Hitchcock Memorial Library and Museum, and the Miller and Daigle Houses.

- Native American Site VT-OL-27 – In a primary survey for a bridge, a chip from a projectile point (single lithic quartzite flake – prehistoric in origin) was found along with some historical evidence such as bone, ceramic, glass, and redware. The bridge project worked around this site. A secondary (phase II) survey was suggested for the area, though not completed at the time of publication of this Plan.

Community Heritage: Agriculture, Milling, Logging and other Historic Sites in the Study Area

- The Bridge of Flowers and Light, Enosburg Falls, VT

- Ring Rock, Enosburg Falls, VT

- Vermont Dairy Festival, Enosburg Falls, VT

- Montgomery House (Currently the Black Lantern), Montgomery, VT

- St Bartholomew's Episcopal Church, Montgomery, VT

    ◊ Since being deconsecrated in 1974, the church has been owned by the Montgomery Historical Society and is now known as Pratt

Hall. On October 1, 1988, it was added to the National Register of Historic Places.

- Bridge #12 (Boston Post Rd) (National Historic Register #07001299). One of a small number of Parker Through Truss bridges remaining in the area, built in 1928.
- Missisquoi River Bridge (Rt. 105A) (National Historic Register #90001494) The first of 12 truss bridges on the Missisquoi between the Canadian Border and Lake Champlain. Added to NRHP in 1990.
- Downtown Richford Historic District added to the NRHP in 1980
- Space Rocket- Space Research Gerald Bull (owner) in North Troy, VT
- Old Iron Mine, Troy, VT
- Troy Blast Furnace/Smelter chimney, halfway between the Town of Troy and the Village of North Troy
- The Long Trail is eligible for the NRHP under Criterion A

IV.b.v.2. Protection Goal for Historic and Cultural Resources:

To preserve the historical and cultural heritage of the upper Missisquoi and Trout River valleys by supporting efforts that maintain and restore prehistoric and historic sites and areas of cultural significance in the Study area towns, with a focus on those which are river related.

IV.b.v.3. Historic and Cultural ORV Management

Figure 52. Wild and Scenic Study Committee member John Little paddles below the Historic Missisquoi River Bridge upstream of Richford. *Photo by Ken Secor*

Table 9. Presence of protections in municipality zoning regulations. Please see the Protection Appendix of this Management Plan and the Town Plans for more information.

Town	Number of Sites in National Register of Historic Places	Protection of Historical/ Archaeological features referenced in Town Plan?	Historical/Archaeological protections in Zoning Bylaws *(with relevant sections of Bylaws)*
Berkshire	0	Yes	• Roads shall be designed and laid out to avoid adverse impacts to historical, cultural and scenic resources (*Section 8.6*) • Planned Unit Developments shall be designed to preserve open space and/or common land for historic site protection. (*Section 9.5*)
Enosburg Falls	1	Yes	• Subdivision and development plans shall be designed to protect existing historic resources of all classes. The protection of an existing historic resource shall include the conservation of the landscape immediately associated with and significant to that resource, to preserve its historic context. (*Section 8.11*) • Adaptive reuse shall be used to continue the viability, reuse, restoration and rehabilitation of historically, culturally or architecturally significant structures within the Village of Enosburg Falls. (*Section 5.2*) • No telecommunications facility may unreasonably interfere with the view from any historic building or district, as determined by the DRB. (*Section 5.13*) • All new development shall make appropriate provisions for preservation of historic sites. (*Section 6.3*) • Site Preservation - Existing site amenities, including archaeological resources, which the DRB determines are assets to the site and/or the community, shall be preserved. (*Section 8.3*)
Enosburgh	5	Yes	• Development must not have an undue adverse effect on the scenic or natural beauty of significant natural and fragile areas, which include historic, cultural, and archaeological areas. (*Sections 455, 460, 640 and 765*)
Montgomery	8	Yes	• Telecommunication towers may not be placed within 500 ft. of any Historic District or property eligible to be listed on the Federal Historic Register, or within 1x the height of any known archaeological site. Telecommunication facilities must also not interfere with the view from any of these areas. (*Sections 6.6 and 6.12*)
Richford	5	Yes	• Telecommunication facilities must not interfere with the view from any natural area including historic buildings and major view corridors. The facility cannot have an adverse aesthetic impact, as determined by the DRB. (*Section 5.9*)
Jay	0	Yes	None
Lowell	0	Yes	None
Westfield	0	Yes	None
Troy	1	Yes	None

IV.b.v.3.a. Threats to Historic and Cultural ORVs:

- Inadequate protection from collection or use
- Private collection of archeological artifacts – unidentified or unregistered archeological areas are not protected from development (and archeological surveys are expensive)
- Prehistoric and historic sites not protected from projects using non-federal funds or not requiring federal permits
- Unreported archeological and historical findings, especially if construction is underway, to prevent delays due to Section 106 review
- Erosion at locations on the immediate banks of the Missisquoi River and Trout Rivers
- Loss of important archeological and historic sites and working farms to development
- Deterioration of covered bridges due to poor maintenance or removal due to 'upgrades' to concrete structures
- Decline of town centers due to reduced economic viability

IV.b.v.3.b. Current Protections for Historic and Cultural ORVs:

Note: This list is not exhaustive. We have sought to list the most relevant protections for these historical and cultural resources below. Please see the Protections section of this Management Plan for further discussion of protections within the Study area.

Federal Protections

The National Register of Historic Places is part of a national program to coordinate and support public and private efforts to identify, evaluate, and protect America's historic and archeological resources.[14] Inclusion on the National Register of Historic Places is the greatest federal protection currently available to historic and cultural ORVs. Although designation of a site or building on the National Historic Register is an honor of recognition, it does not qualify the site for special protections from development or alteration nor does it impose any legal requirements on the property owner. Owners of the registered site or building are free to alter the property as they wish using private funds. Section 106 of the National Historic Preservation Act (1966) requires a review of federally funded projects for cultural impacts. Potential impacts of federal projects on the historical and archeological resources must be ascertained, and adverse effects must be prevented.

Table 10. ORVs in the Historic and Cultural category are covered by a variety of federal, state and/or local protections. This table contains a listing of Historic and Cultural ORVs and the protection categories that pertain to each (see the appropriate protection appendices for further discussion).

Historic and Cultural ORV	Protection Categories			
	Water Quality	Historic and Cultural	Natural Resource	Scenic and Recreational
Archaeological Sites		X	X	
Covered Bridges		X		X
Other Historic Bridges		X		
Historic Sites – Buildings, etc.		X	X	X
Downtown Historic Districts		X		X

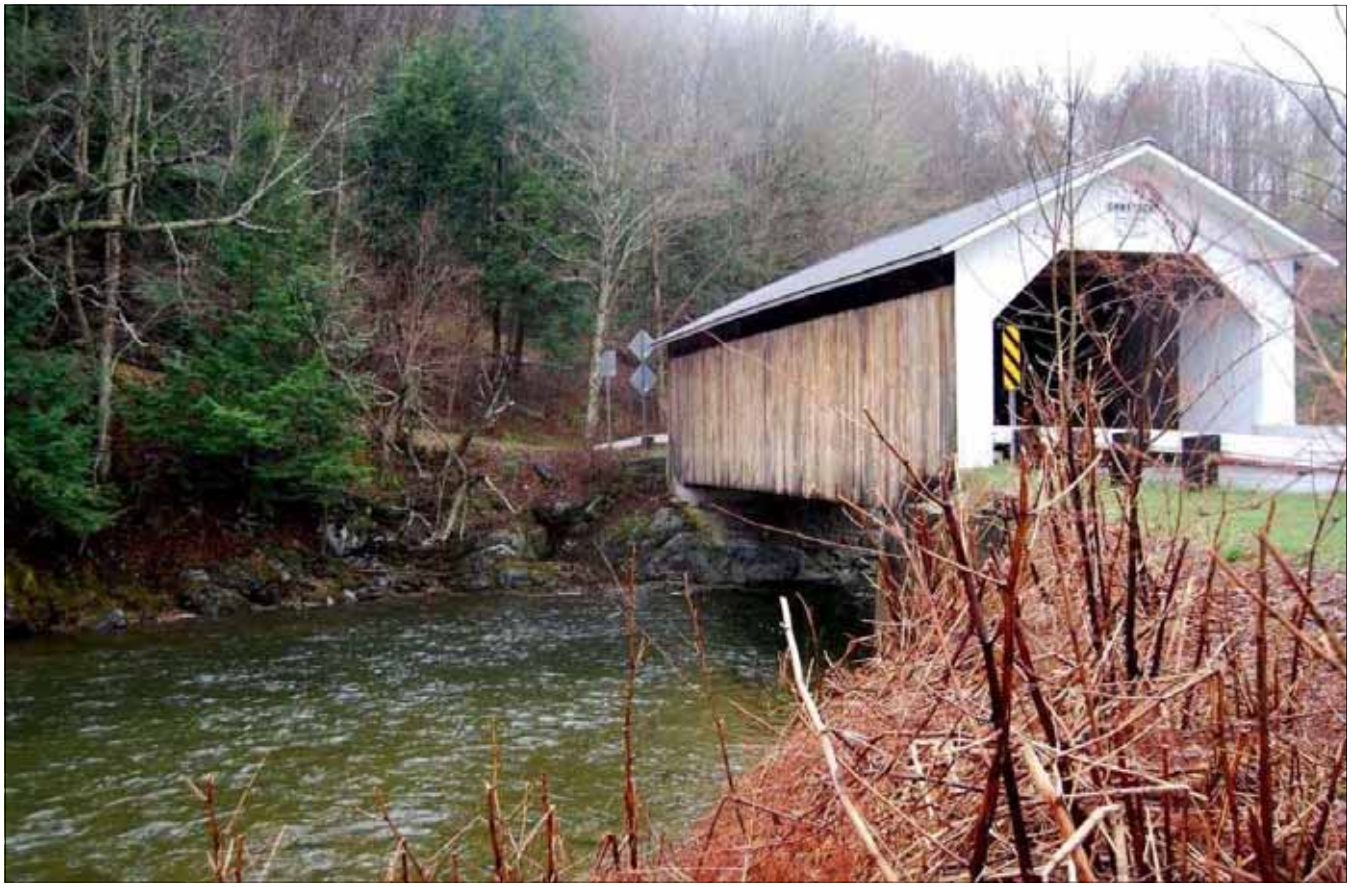


Figure 53. Comstock Bridge, over the Trout River in Montgomery. *Photo by Ken Secor*

Federal ownership: There are currently no federally-maintained parks or lands in the Study area towns which would afford protection of lands at a federal level.

State Protections

The State of Vermont intends that municipalities, regional planning commissions and State agencies continue to identify, protect and preserve important natural and historic features of the Vermont landscape, including important historic structures, sites, or districts, archaeological sites and archaeologically sensitive areas (24A V.S.A. § 4412). The placement of wireless telecommunication towers is also restricted when the facility may adversely impact an historic site (24 V.S.A. § 2291).

The Vermont Division for Historic Preservation reviews and comments on projects involving State funding, licenses or permits under The Vermont Historic Preservation Act (22 V.S.A. Chapter 14). This review looks at possible negative impacts on historic resources including those sites listed on the Vermont Register of Historic Places and any potentially historically, architecturally, archeologically or culturally significant sites.

The Vermont State Archaeologist has the authority to designate a site as a "State Archaeological Landmark" if the site is determined to be of significance to scientific study or a represents the State's historical, prehistorical or aboriginal past. This designation allows the State to restrict access and field investigation privileges on State lands in order to preserve and protect historical resources that may be present there (22 V.S.A. § 762). State

Archaeological Landmarks on private lands will not be designated without the written consent of the landowner (22 V.S.A. § 763). Information regarding the location of these Landmark sites will remain confidential, but the State Archaeologist may share the information with qualified individuals or organizations for scientific research or preservation and planning purposes (22 V.S.A. § 761). It is against State law to dig, collect or disturb archaeological resources or burial grounds on any public land or under State waters (22 V.S.A. § 762, 764, 782). On private land, archaeological sites and the artifacts there belong to the landowner. Burial sites, however, are protected from disturbance on both public and private lands (13 V.S.A. § 3761, 3764; 18 V.S.A. § 5212).

The Vermont Division of Historic Preservation is authorized to take steps for the preservation of Historic Bridges, nine of which exist over sections of the Study rivers. The Division may accept transfer of bridges from the Agency of Transportation that have been deemed appropriate for preservation by the secretaries of the Agency of Transportation (AOT) and the agency of commerce and community development (ACCD). After ownership of the bridge is transferred, a right-of-way is maintained so that public use of the bridge may continue. The Division of Historic Preservation is further authorized to maintain, preserve, protect and control the use of historic bridges, bridge sites and bridge approaches. The division is also authorized to remove the bridge to an off-site location for repairs (19 V.S.A. § 317), as is the current situation of the Hectorville Covered Bridge in Montgomery.

Act 250

Environmental Criterion 8 of Act 250 (10 V.S.A. Chapter 151) is of particular note to the historic and cultural resources in the Wild & Scenic Study towns. The Vermont Division for Historic Preservation reviews and comments on projects involving State funding, licenses or permits under Criterion 8. This review looks at possible negative impacts on historic resources when considering the issuance of an Act 250 permit. All sites on the National or Vermont State Register of Historic Places are considered "historic sites" under Act 250.

For more information on Act 250, please see the Act 250 chapter in Appendix 9, or contact your local District Coordinator.

The Downtown Development Act

Downtowns, including villages, may be designated and become eligible for funds for revitalization efforts. Enosburg Falls, Montgomery Center and Village and Richford are so designated, and thus eligible to receive priority for grant funds. Landowners in designated areas are also eligible to receive tax credits for renovation and revitalization projects.

Regional Plans (non-regulatory)

The Northwest Regional Planning Commission's (NRPC) Regional Plan for 2007-2012 states that "Historic structures, community facilities, and other buildings should be preserved and adapted for re-use." They also suggest utilizing federal, state, and local programs for developing or preserving local cultural and historic assets.

The Northeastern Vermont Development Association's (NVDA) Regional Plan (2006) suggests a 200 foot buffer to protect archeologically significant areas found along the Missisquoi and Trout Rivers. Goals in this Plan include preserving important historical structures and mapping potential archeological sites.

Town and Village (Local) Protections

All of the Study towns reference the importance of maintaining and preserving historical and/or archaeological sites in their respective town plans. However, only five of the ten municipalities have provisions in their zoning bylaws that offer regulatory protection to these cultural resources. Lowell, Westfield, Jay and Troy and North Troy

(which share a Town Plan and Zoning Bylaws) have no laws protecting historic resources. Montgomery and Richford have provisions regarding the placement of wireless telecommunication towers and facilities; specifically, that the facility may not have an adverse aesthetic impact on historic sites, including the view from those areas. Berkshire's Bylaws state that all roads and planned unit developments must be laid out in such a way that natural areas and historic sites are preserved and protected. Enosburgh prohibits any development from having an adverse impact on historic, cultural, and archaeological areas. Enosburg Falls is explicit in its provisions for the preservation of historic places, including a specification that "adaptive reuse" of historical buildings may be employed "to continue the viability, reuse, restoration and rehabilitation of historically, culturally or architecturally significant structures within the Village of Enosburg Falls."

IV.b.v.3.c. Gaps in Protections for Historic and Cultural ORVs:

- Federal and State laws prohibit the disturbance of historic and archaeological sites on public lands. Since there is very little public land in the Study area, many known and undiscovered sites in the area have little if any protection from disturbance.

- Only sites in the National Register of Historic Places have protection from federally funded/ permitted projects. Privately funded projects on private lands are allowed, even if they impact historic places in the National Register.

- Vermont law states that archeological sites and their artifacts on private land belong to the landowner. This is especially relevant in the "Areas of Archaeological Sensitivity" that have been identified along the Study rivers throughout most of the Study area. Many of these areas have not had thorough archaeological investigations, and remain in the hands of private landowners.

- Jay, Lowell, Troy/North Troy and Westfield do not have zoning bylaws about the protection or preservation of historical or archaeological sites, even though sites likely exist in all of these towns.

- Montgomery's and Richford's bylaws regarding the protection of historical and archaeological sites are limited to regulating the location of new telecommunication towers. With Montgomery's abundance of covered bridges (which are all in the National Register of Historic Places), more explicit provisions regarding the protection and preservation of sites may be important to community members.

- There are no protections for undocumented sites.

IV.b.v.3.d. Opportunities for Action/Management Recommendations: Historic and Cultural ORVs:

Education and Outreach

≈ Seek ways to support archeological explorations in priority areas that have not previously been surveyed - perhaps test pit surveys. Explore having students at local colleges, such as UVM, to help with these surveys

≈ Educate the public about the rich history of the Missisquoi and Trout Rivers through, perhaps, a guide, additions to riverside signs, covered bridge tour, or other outreach activities

≈ Look into support for a Covered Bridge Festival, to include possible photography and biking tours of the Study area covered bridges

Funding

≈ Seek ways to fund maintenance and repair of covered bridges; the Longley and Hectorville Bridges are top priorities

≈ Help towns and organizations achieve preservation of historical and cultural sites within the Study area by leveraging State resources

Local Planning

≈ Encourage towns to adopt priority provisions in town plans and zoning bylaws to protect historical resources. Assist in this process as much as possible

≈ Encourage Lowell, Westfield, Jay, Troy and North Troy to include protection or preservation of historical or archaeological sites in their zoning

≈ Encourage Montgomery and Richford to expand their zoning protections for historical and archaeological sites

≈ Help those towns with Historic Districts related to the rivers improve tourism and revitalization of downtowns/villages as appropriate

≈ Help any interested and eligible communities to become designated under the Downtown Development Act

Resource Identification

≈ Explore possibilities for protection of archeological and historical sites in private ownership

≈ Work with willing landowners (and the VT DHP) who may wish to add historical/cultural sites on their land to the National or Vermont Register of Historic Places where eligible

≈ Work with VT DHP during Section 106 Reviews to be sure archeological sites are identified and preserved when possible

Volunteer Opportunities

≈ Work with willing landowners to prevent erosion in the floodplain and help stabilize actively eroding archeological sites using suggested methods such as geotextile fiber (see the Water Quality ORV chapter for more information on erosion prevention)

≈ The post-designation Wild and Scenic Advisory Committee and the NPS may draft an MOU, if designation occurs, and if desired by the relevant State agencies such as VAAFM to guide and streamline the Section 7 Review process

Work with Private Landowners

≈ Support the preservation of working farms in the Study area, especially those which utilize BMPs to protect water quality (please see the water quality section of this Management Plan for more specific goals)

Endnotes

[1] Follett, Elias. (1891). *The Valley of the Trout.* Courtesy of the Enosburgh Historical Society. Original from Barbara Follett Schweger (BFSchweger[at]aol.com) from Edmonton, Alberta, Canada.

[2] Notes from Bobby Farlice-Rubio's talk at the September 16, 2010 Study Committee meeting in Montgomery, VT. Bobby is the Museum Educator at the Fairbanks Museum in St. Johnsbury, VT (www.fairbanksmuseum.org/).

[3] Frink, Douglas S. (1986). *Barton and Clyde Rivers Watershed: Caledonia, Essex and Orleans Counties Vermont. Reconnaissance Level Archeological Evaluation for United States Department of Agriculture Soil Conservation Service Burlington, Vermont.* Vermont Division of Historical Preservation Archieves, Montpelier, VT (from Westfield VT-FS1(OL).

[4] Geraw, Janice Fleury. (Compiled by). (1985). *Enosburgh, Vermont.* Enosburgh, Vermont: The Enosburgh Historical Society, Inc. (This quote from *Thompson's Vermont*, Civil History, pg.2).

[5] VT Agency of Environmental Conservation. (1986). *Vermont Rivers Study.* Published with the assistance of the National Park Service Mid-Atlantic Regional Office.

[6] The Berkshire Historical Society. (1994). *History of Berkshire*. St. Albans, VT: The Berkshire Historical Society.

[7] Montgomery Historical Society. (n.d.) Montgomery's Covered Bridges 1863-1890. Retrieved on May 10, 2010 from the Town of Montgomery's Website www.montgomeryvt.us/pdf/mhsbridgepam.pdf

[8] The National Register of Historic Places. (Last updated 2012, June 9). NPS Focus Resource Search. Retrieved June 9, 2012 from (nrhp.focus.nps.gov/natreghome.do?searchtype=natreghome).

[9] Wills, Matt. (Last updated 2012, March 10). The Virtual Vermont Internet Magazine's list of photographs and historical information on Vermont's Covered Bridges. Retrieved on May 6, 2010 www.virtualvermont.com/coveredbridges/

[10] Montgomery Historical Society. (n.d.) Montgomery's Covered Bridges 1863-1890. Retrieved on May 10, 2010 from the Town of Montgomery's Website www.montgomeryvt.us/pdf/mhsbridgepam.pdf

[11] Files from the Vermont Division of Historic Preservation's Resource Room on the second floor of the North Building at the National Life complex in Montpelier (accd.vermont.gov/strong_communities/preservation/education/resource_room).

[12] Henry, Hugh H., preparer. (1974). *National Register of Historic Places Inventory – Nomination Form – Hectorville Covered Bridge, Montgomery, VT.* Brattleboro, VT.

[13] Lendway, Jane. (2006). *Tillotson Camp Section 106 Reivew.* Vermont Division of Historical Preservation Archieves, Montpelier, VT.

[14] www.cr.nps.gov/nr/index.htm

Additional Resources

- 1878 Beer's Atlas: www.old-maps.com/vermont.htm
- Abenaki Tribal Council of Missisquoi, PO Box 133, Swanton, VT 05488; Dawnland@Missisquoi.comcastbiz.net
- Farmer's Watershed Alliance: farmerswatershedalliance.com/
- Franklin County Historic Sites: www.nationalregisterofhistoricplaces.com/vt/Franklin/state.html
- Franklin County Historical Societies: vermonthistory.org/index.php?option=com_content&task=view&id=226&Itemid=115
- Montgomery Historical Society: www.montgomeryhistoricalsociety.org/
- Orleans County Historic Sites: www.nationalregisterofhistoricplaces.com/vt/Orleans/state.html
- Orleans County Historical Societies: vermonthistory.org/index.php?option=com_content&task=view&id=225&Itemid=122
- Vermont Dairy Festival: www.vermontdairyfestival.com/index.htm
- Vermont Division of Historic Preservation: accd.vermont.gov/strong_communities/preservation/
- Vermont Eugenics Surveys: www.uvm.edu/~eugenics/famstudies.html
- Vermont Historical Society: www.vermonthistory.org/
- Vermont Statutes Online: www.leg.state.vt.us/statutesMain.cfm

All ORV chapters have corresponding Appendices which are available online. Please see the Historic/Cultural Protections Appendix 6 and Abenaki Resources from the Fairbanks Museum Appendix 18 of this Management Plan for more information. **Please also see the Historic and Cultural ORV fold out map at the end of this Management Plan.**

Chapter V. Management Plan Post-Designation (Should Designation Occur)

Photo by Art Bell

V. Management Plan Post-designation (If Designation Occurs)

V.a. Post-designation Wild and Scenic Advisory Committee Establishment

Should the upper Missisquoi and Trout Rivers be federally designated as part of the Wild and Scenic River System, a local Advisory Committee will be established. This Committee will be made up of official appointees chosen by the selectboards in the towns and villages with designated reaches and likely include partnerships with interested organizations and citizens who choose to attend (in much the same way that the Study Committee was established with participation from the Missisquoi River Basin Association, National Park Service, Northeastern Vermont Development Association, Northwest Regional Planning Commission, VT Agency of Agriculture, Food, and Markets, VT Department of Environmental Conservation, VT Federation of Sportsmen's Clubs, and VT Traditions Coalition – see Chapter I for more details). The Advisory Committee will use this Plan as a road map following designation, and work toward to goals and recommendations included in the Plan with the help of the National Park Service. Once formed, members will choose to adopt bylaws specifying how to govern itself including election of officers and decision making.

The goal of a post-designation Advisory Committee would be use this Management Plan as a framework to encourage local, state and federal planning to take the Outstandingly Remarkable Values identified in this Management Plan into consideration, as well as administer any Wild and Scenic funds allocated to the designated rivers to protect the resources of the Upper Missisquoi and Trout Rivers.

The goal of the Advisory Committee would be use this Management Plan as a framework to encourage local, state and federal planning to take the Outstandingly Remarkable Values identified in this Management Plan into

consideration, and make decisions which protect the resources of the Missisquoi and Trout Rivers. They would also administer any Wild and Scenic funds allocated to the designated rivers, and assist in any Section 7 Reviews (of only those projects with full or partial federal funding or permitting, construction and development and related to water resources with a potential adverse effect on the rivers – see Chapter I of this Management Plan which further discusses Wild and Scenic designation for more information).

V.b. Post-designation Project Funding Prioritization

Along with designation comes federal funding meant to aid in implementation of the Management Plan and protection of the values for which the rivers are designated, the Outstandingly Remarkable Values (ORVs). The amount of this funding varies, but in previous years designated Partnership Wild and Scenic Rivers (those predominantly running through privately, rather than federally owned lands) have received up to $170,000 each. This funding is managed by the post-designation Advisory Committee made up of locally appointed representatives. Other designated rivers have used these funds to hire local staff support (a Committee Coordinator), and protect and enhance ORVs in some of the following ways (though the upper Missisquoi and Trout Rivers Advisory Committee is not bound or limited to these uses):

- ≈ improved river access for recreation including safe steps for anglers, boat launches, or boardwalk construction
- ≈ boater trail and recreational maps
- ≈ studies of and best management practices for stormwater management
- ≈ small grant programs providing grant opportunities for local organizations to provide education about or protection of ORVs
- ≈ biological studies monitoring water quality (through chemical and physical, geomorphological, macroinvertebrate, mussels, or fish) or vernal pool and wetland studies

Figure 54. Wild and Scenic Study Committee members John Little and Cynthia Scott on the Missisquoi River in Westfield. *Photo by Shana Stewart Deeds*

≈ historical and archeological assessments

≈ conservation easements

≈ river-themed music and arts festivals

≈ invasive species management

≈ natural resource inventories

As one can see, Wild and Scenic designation advisory committees utilize funds for the betterment of the community and the designated rivers. Project prioritization for funding will be set by the local Advisory Committee, and will focus on those projects which educate about or provide protection for the ORVs. Decision-making about how funds will be used post-designation are made by the Selectboard-appointed Advisory Committee. The Committee will design and adopt a working budget as the Study Committee did at meetings with valuable input by local citizens and key Committee partners such as the Missisquoi River Basin Association, Planning Commissions, Conservation Commission representatives, National Park Service, and State agencies and organizations.

V.c. Post-designation Section 7 Review

Designation provides local input into the Section 7 review process. Under Section 7 of the Wild and Scenic Act only those projects with full or partial federal funding or permitting, construction and development and water resource related projects are reviewed by the post-designation Advisory Committee and the National Park Service for potentially adverse effects on the rivers. This gives local input into the design and outcome of federally assisted projects. Examples of the types of projects which would typically fall under this category include those river-related projects which already fall under Section 404 of the Clean Water Act administered by the Army Corps of Engineers and the National Environmental Policy Act's (NEPA) including Environmental Assessment and Environmental Impact Statements implemented by the EPA. The NPS and the local Advisory Committee would be consulted by the federal assisting (permitting, funding, etc.) agency during the normal review process that would occur regardless of Wild and Scenic designation. Projects might include dredging for repairs to a bridge piling, or construction at a border crossing station on the river. This review is meant to assess proposed projects to be sure federal actions are reviewed with full consideration of the potential impacts on the Wild and Scenic River and its ORVs, and to avoid these impacts. Please see Chapter I of this Management Plan which further discusses Wild and Scenic designation for more information.

V.d. Role of Local, Post-designation Advisory Committee

One of the most important roles of the post-designation Advisory Committee is to serve as a communication and coordination body bringing together municipalities and key partners on a regular and ongoing basis to promote good decision-making regarding the rivers. With monthly meetings and activities providing a regular and reliable forum for discussion, research, and consensus building with around river matters, the Committee will support good river management.

The Committee will not have a regulatory role, but will have a formal advisory role related to the Wild and Scenic River designation and the National Park Service, and may also advise and assist landowners, local communities, State agency partners, and others.

The Committee may utilize funding support received through the National Park Service to undertake projects directly or, most likely, in partnership with one or more local partners. It is anticipated that similar activities (as in chapter V) will occur if designation of the Study rivers occurs. These types activities, including education and outreach, and the recommendations and opportunities for action discussed in this Plan begin to design the road map for future Wild and Scenic activities. Any suggestions

As discussed above, designation as a federal Wild and Scenic River has only two regulatory impacts on the designated stretches of river.

1. No new dams or FERC licensed hydropower facilities may be built – this has little bearing on the Study Area as economically feasible and environmentally permissible sites (given current technologies, State environmental permit regulations, and site conditions) on the mainstem of the Study rivers have already been developed or preserved (as in the case of Big Falls State Park)

2. Federally-assisted projects which are river related, receive full or partial federal funding or permitting, and are construction and development projects are reviewed under Section 7 of the Act – few projects in the Study area meet all of these criteria necessary to be included in Section 7 review

The laws and procedures which currently govern the use and management of water resources and the management of private lands remain in effect. These laws still govern local land use. Ownership of lands is not transferred with designation; those who previously owned lands still own the same lands after designation.

for such activities should be directed to the Committee coordinator. Contact information may be found on the website (www.vtwsr.org). An example of the role of the Taunton River post-designation Wild and Scenic Committee may be found in Appendix 8.

The National Park Service provides advisory and technical assistance to the post-designation Advisory Committee. The NPS is charged with administering the Wild and Scenic designation, assisting in implementing the Management Plan with the Advisory Committee, and reviewing projects which fall under the protection of Section 7 of the Wild and Scenic Act. The NPS will help protect the ORVs from federally funded or permitted "water resource development projects" which could have a "direct and adverse impact" upon the ORVs which made the upper Missisquoi and Trout eligible for designation.

The post-designation Advisory Committee would be expected to carry out regular review and updates to the Management Plan. The Study Committee recommends that this review and updating of the Wild and Scenic Management Plan occur every five years post-designation due to the constantly changing nature of the regulations, technology, plans, and community goals within the area. Should the Advisory Committee propose a major or significant revision to the Management Plan, the Study Committee recommends a full review process, such as that prior to the adoption of this Management Plan. The Study Committee envisions that this would include a public review and comment period on the draft Management Plan followed by adoption by the locally appointed Wild and Scenic Advisory Committee.

Photo by Ken Secor

Chapter VI. The Continuing Road Toward Designation

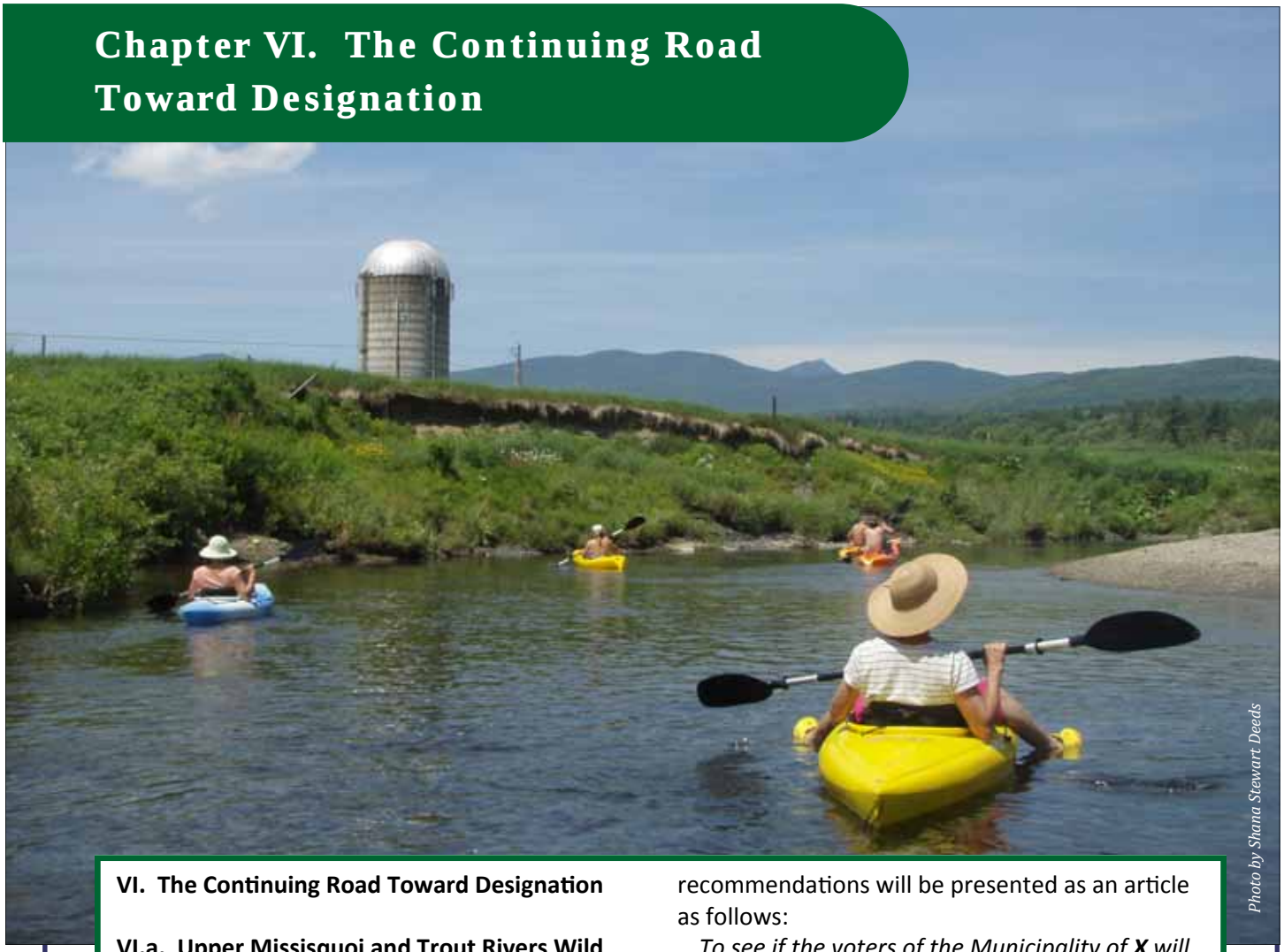


Photo by Shana Stewart Deeds

VI. The Continuing Road Toward Designation

VI.a. Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee Recommendations

Over the last several years the Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee has studied these rivers and their eligibility for designation. The Committee seriously considered the input by local community members along with their concerns about designation and the possible benefits of inclusion in the federal program. The Partnership Wild and Scenic River approach proved itself successful elsewhere in New England, and the Committee believes that designation can be an important tool for local river protection without incurring an unwanted or heavy federal presence in the region. For these reasons, the Study Committee recommends that these rivers be considered for designation, and voted to bring the matter to the Study area municipalities at the March 2013 town meetings. The Study Committee's recommendations will be presented as an article as follows:

*To see if the voters of the Municipality of **X** will petition the Congress of the United States of America that the upper Missisquoi and Trout Rivers be designated as Wild and Scenic Rivers with the understanding that such designation would be based on the locally-developed rivers Management Plan and would not involve federal acquisition or management of lands.*

VI.b. Approval at Town Meetings

Favorable votes at town meetings will demonstrate local support for designation which is important for further action by Congress. Following town meetings, the Study Committee and the National Park Service will draft a report to Congress that documents the eligibility and suitability (including demonstration of local support per town meeting votes) of the upper Missisquoi and Trout Rivers to become part of the Wild and Scenic Rivers System. Designation will occur in the event that Congress enacts a bill

amending the Wild and Scenic Rivers Act to add the upper Missisquoi and Trout Rivers into the System which is then signed into law by the President.

VI.c. What if Municipalities Vote Against Designation?

The National Park Service and Study Committee will only recommend Wild and Scenic designation within towns that have voted favorably on the Town Meeting article. Similarly, the congressional sponsors of the Wild and Scenic Study have been clear that they will respect Town Meeting results, and will only sponsor the legislation for designation if there is local support. Congress typically does not amend the Wild and Scenic Rivers Act to include rivers that do not have local support to protect them. Following the votes at Town Meetings, the Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee will convene to discuss the outcome of the votes. Should the majority of municipalities vote to accept the article, thus forming a fairly continuous stretch of the rivers with support for designation, the Committee will petition Congress to designate those portions of the rivers.

If there are towns which do not vote to support designation the Study Committee will take the following actions prior to making their report to Congress:

1. Talk with Selectboards, community members, and attend meetings of local organizations in 'no' towns to ascertain why the voters may have rejected the article
2. Work to address concerns that may exist about designation
3. Consider requesting municipal reconsideration of the article at a future town-wide vote.

There have been instances where communities have voted against designation only to revisit the question and vote in favor the next, or even fifteen years later. Such municipal reconsideration can be time consuming and necessitate passage of additional Acts of Congress to achieve designation. It is preferable for the original report is to Congress to reflect broad support in all interested communities.

****Town Meeting Outcome March 2013****

Based on voter support in eight of the nine municipalities voting in their March 2013 Town Meetings (Berkshire, Enosburgh/Enosburg Falls, Montgomery, Richford, Troy/North Troy, and Westfield) the Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee has agreed to petition our U.S. Senate and House Representatives to introduce bills to Congress to request an amendment to the National Wild and Scenic Rivers Act to include the Missisquoi (from Westfield to Enosburg Falls excluding the Enosburg Falls, North Troy and Troy hydroelectric facilities) and the Trout Rivers as Wild and Scenic Rivers. Should this pass through Congress, such a bill would need to be signed into law by the U.S. President as was legislation authorizing the Study.

VI.d. Contact Information

The Upper Missisquoi and Trout Rivers Wild and Scenic Study Committee welcomes your input. As it has throughout the Study process, the Committee takes community input into consideration in its decision making. Feel free to contact the Committee with any questions, concerns and suggestions at::

Upper Missisquoi and Trout Rivers
Wild and Scenic Study Committee
2839 VT Route 105
East Berkshire, VT 05447
802-393-0076
info@vtwsr.org
http://www.vtwsr.org/

Figure 55. Lunch on the Missisquoi. *Photo by Ave Leslie*

Missisquoi Watershed

Proposed Wild and Scenic Designation
Missisquoi and Trout Rivers

Major River or Stream

River Segments Proposed for Wild and Scenic Designation

County Boundary

Municipal Boundary

State Highway

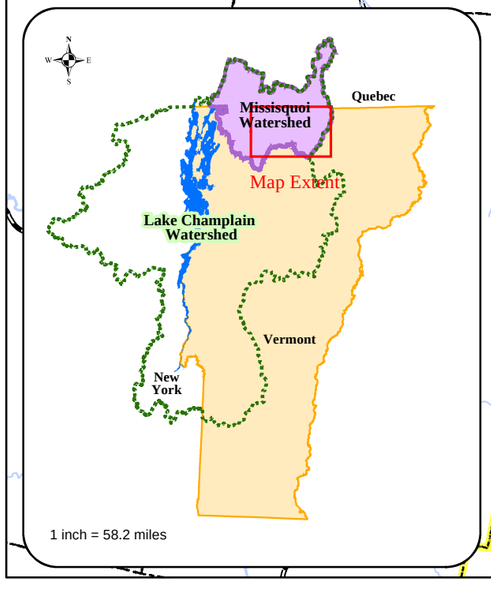
Federal Highway

Interstate Highway

International Boundary

0 1 2 4 Miles

0 1 2 4 Kilometers



Map Prepared By:
Northwest RPC
155 Lake Street
Saint Albans, VT 05478
802-524-5958
www.nrpcvt.com
March, 2013
For Planning Purposes Only

Examples of Recreational Opportunities in the Wild & Scenic Study Area:

- Missisquoi Valley Rail Trail
- Sport Fishing: Many populations of brown, rainbow and native brook trout
- Numerous Swimming Holes
- Long Trail, Catamount Trail, VAST trails, Mountain Biking
- Part of the Northern Forest Canoe Trail
- Birding and other wildlife viewing
- Hunting for deer, bear, ducks, moose, geese and more
- Dairy Festival in Enosburg Falls
- Jay Peak Mountain Resort
- Stargazing on many high peaks in area
- Covered bridges and other aesthetic areas
- Whitewater paddling on Missisquoi River and many tributaries

VT Wild & Scenic Rivers
Upper Missisquoi & Trout Rivers Study

Upper Missisquoi & Trout Rivers Outstandingly Remarkable Values:

Scenic & Recreational

- Access Points
- Geologic Features
- Waterfalls
- Swimming Holes
- CoveredBridges
- State Parks
- Northern Forest Canoe Trail Access
- Outdoor Recreational Sites
- Catamount Ski Trail (Winter Use Only)
- Long Trail
- Other Recreational Trails
- Conserved Lands - Town Forests
- Conserved Lands - Public
- Conserved Lands - Private (Not Shown)
- Wild & Scenic Study Area

Berkshire
Richford
Enosburgh
Enosburg Falls
SHELDON
Jay
Troy
North Troy
Westfield
Montgomery
Lowell
NEWPORT TOWN

Little Pond
Giddings Brook
Missisquoi River
Hardwood Hill
Guilliguettes Pond
Loveland Brook
Mountain Brook
Stanhope Brook
Warner Hill
Big Falls
Jay Branch Gorge
Crook Brook
Four Corners Swimming Hole
River Road Covered Bridge
Troy Gorges
North Jay Peak
Jay Branch Falls
Jay Branch
Black Falls Brook
Jay Peak
Big Jay
Little Jay
Gilpin Mtn
Bakers Falls
Coburn Brook
Mill Brook Falls
Mill Brook
Domeys Dome
Jay Brook
Buchanan Mtn
Taft Brook
Taft Brook Falls
Taft Brook Falls Swimming Holes
Snider Brook Swimming Holes
Snider Brook
Hopkins Covered Bridge
Black Falls Brook Swimming Holes
Longley Bridge Swimming Hole
Fuller Covered Bridge
Longley Covered Bridge
Comstock Covered Bridge
Montgomery School House Swimming Hole
Gray Rocks Swimming Hole
Three Holes Falls
Three Holes Swimming Area
Wade Brook
West Hill Brook Falls
Hippie Hole
West Hill (Creamery) Covered Bridge
Hutchins Covered Bridge
Hutchins Bridge Cascades
Gibou Bridge Swimming Holes
Hutchins & Hectorville Bridges Swimming Hole
Hectorville Covered Bridge (currently in storage)
Sugarloaf Mtn
Strawberry Hill
Burnt Mtn
Tamarack Brook
Pacific Brook
South Branch Trout River
Haystack Mtn
McAllister Pond
Browns Ledges
Parman Hill
Tillotson Peak
Burgess Branch
Twin Falls
Twin Falls Swimming Hole
Le Clair Brook
Tamarack Brook
2.5
Miles

Greeen Mountain Wildlife Habitat Linkages
The Spine of the Green Mountains, running North-South through the Eastern portion of the study area, provides an important contiguous habitat corridor for bear, bobcat, moose, deer and other wildlife (see Connectivity Map for more information).

Rare Species in the Study Area
The Study area is home to many species, habitats and natural features that are rare in the State. The locations of these features are not mapped here in order to protect the sensitivity of their locations.

VT Wild & Scenic Rivers
Upper Missisquoi & Trout Rivers Study

Upper Missisquoi & Trout Rivers Outstandingly Remarkable Values:

Natural Resources

- Upper Missisquoi & Trout Rivers Study Area
- Geologic Features
- Waterfalls
- EcologicalFeatures
- Study Area Vernal Pools
- Deer Wintering Areas

Conserved Lands
- Town Forests
- Public
- Private (Not Shown)

Important Bird Areas (IBAs)
- Bicknell's Thrush
- Peregrine Falcon Eyre

Ayers Hill
Berkshire Copper Mine
Berkshire
Pike River
Berkshire Kettle Hole
Franklin
Lake Carmi
Carmi, Lake
236
Little Pond
108
Giddings Brook
Missisquoi River
Guillmettes Pond
Loveland Brook
Richford
1054
Richford Mineral Area
Mountain Brook
Stannope Brook
105
Jay
Jay Branch Gorge
Jay Branch Falls
Jay Branch
Bicknell's Thrush IBA Complex
242
Dunn Brook
243
North Troy
Big Falls
Troy Gorges
Troy
101
Baker's Falls
Coburn Brook
Mill Brook Falls
Mill Brook
Beetle Brook
Newport Town
Sheldon
Enosburg Falls
Enosburgh
Woodard Swamp
Black Falls Brook
Hippie Hole - Glacial Potholes
Jay Brook
Three Holes Falls
West Hill Brook Falls
Hutchins Bridge Cascades
Tamarack Brook
Wade Brook
Montgomery
Pacific Brook
Haystack Mountain Arctic-Alpine Flora
Peregrine Falcon Eyre IBA Complex
McAllister Pond Marsh
McAllister Pond
Westfield
100
Snider Brook
Taft Brook
Taft Brook Falls
Tamarack Brook Flats
Le Clair Brook
Lowell
Burgess Branch
Twin Falls
58
Tillotson Mills
Tillotson Mill
Truland Brook
Irasburg
Eden
Calevale Brook
118
2.5
Miles

Upper Missisquoi and Trout Wild and Scenic Study

Habitat Connectivity

Wild & Scenic Study Area

Study Area Towns

Rivers & Streams

Stream Order

- 3
- 4
- 5

Staying Connected Initiative

Final Connective Areas

- 1 - Existing - Mostly Intact Forest Cover
- 2 - Existing - Moderately Fragmented Forest Cover
- 3 - Potential - Potential for Improved Forest Cover

Franklin
Berkshire
Richford
Jay
North Troy
Troy
Newport Town
Sheldon
Enosburg Falls
Enosburgh
Westfield
Coventry
Montgomery
Lowell
Irasburg
Eden
Albany
Lake Carmi
Carmi, Lake
Little Pond
Guillmettes Pond
McAllister Pond
Belvidere Pond
Pike River
Mineral Brook
Marsh Brook
Giddings Brook
Missisquoi River
Loveland Brook
Mountain Brook
Stanhope Brook
Lucas Brook
Crooks Brook
Jay Branch
Dunn Brook
Black Falls Brook
West Hill Brook
Trout River
Jay Brook
Coburn Brook
Mill Brook
Beetle Brook
Goodsell Brook
Tyler Branch
Bogue Branch
Cold Hollow Brook
Tamarack Brook
Pacific Brook
Wade Brook
Taft Brook
Snider Brook
Mineral Spring Brook
Le Clair Brook
Truland Brook
Burgess Brook
Calavale Brook
Lamphean Brook
120
105
108
105A
243
101
242
100
58
118
2.5
Miles

"Class A" is Vermont's highest water quality designation and has the strictest protections in Vermont's Water Quality Standards. Within the Class A designation, Class A(1) waters include those above 2,500 feet in elevation, or those of unique ecological significance. Class A(2) waters are managed for the purpose of protecting public water supplies.

Upper Missisquoi & Trout Rivers Outstandingly Remarkable Values:

Water Quality

VT Wild & Scenic Rivers
Upper Missisquoi & Trout Rivers Study

ANR - DEC Macroinvertebrate Community Assessment Sites

- Excellent
- Excellent - Very Good
- Very Good

ANR - DEC Fish Community Assessment Sites

- Very Good
- Excellent

ANR - DEC High Quality Biological Community Location *(Stream Reaches Labeled)*

Class "A" Designated Waters

- Class "A(1)" Waters
- Class "A(2)" Waters

Upper Missisquoi & Trout Rivers -- Wild and Scenic Study Area

Missisquoi River
Berry Brook
Fountain Brook
Stanhope Brook
Lucas Brook
Richford
Berkshire
FRANKLIN
Loveland Brook
Guillmettes Pond
Loveland Brook
Stanhope Brook
Jay
Crook Brook
North Troy
Dunn Brook
Missisquoi River
Troy
Little Pond
Giddings Brook
Trout Brook
Jay Branch
Jay Branch Trib 12 Jay Branch Trib #10
Black Falls Brook
Black Falls Brook
Coburn Brook
Coburn Brook
NEWPORT TOWN
SHELDON
Enosburg Falls
Enosburgh
West Hill Brook
Hannah Clark Brook
Jay Brook
Westfield
Mill Brook
Beetle Brook
Trout River
West Hill Brook
Taft Brook
Tyler Branch
Wade Brook
Snider Brook
Mineral Spring Brook
Mineral Spring Brook
Montgomery
Pacific Brook
McAllister Pond
Le Clair Brook
IRASBURG
Lowell
Burgess Branch
Truland Brook
Calavale Brook
Burgess Branch
EDEN
Belvidere Pond
Larr
2.5
Miles

Upper Missisquoi and Trout Wild and Scenic Study

Gaps in Riparian Vegetation

Gaps in Riparian Vegetation

- Intact Riparian Vegetation
- Gap in Riparian Vegetation
- **Wild & Scenic Study Area**

Study Area Towns

Roads

- US Highway
- Vermont State Highway
- Class 1 Town Highway

Riparian Gap Data from Vermont NRCS, received August 2012.

Berkshire
Richford
Jay
North Troy
Troy
Enosburgh
Enosburg Falls
Montgomery
Westfield
Lowell
FRANKLIN
SHELDON
NEWPORT TOWN
IRASBURG
EDEN
VT-120
VT-236
VT-108
VT-105
VT-105A
VT-242
VT-101
VT-100
VT-58
TH-2
TH-1
TH-3
Lake Carmi
Carmi, Lake
Little Pond
Guillmettes Pond
McAllister Pond
Belvidere Pond
Pike River
Mineral Brook
Giddings Brook
Missisquoi River
Orleans Brook
Mountain Brook
Stanhope Brook
Lucas Brook
Crook Brook
Jay Branch
Dunn Brook
Coburn Brook
Mill Brook
Beetle Brook
Black Falls Brook
West Hill Brook
Trout River
Jay Brook
Tamarack Brook
South Branch Trout River
Pacific Brook
Wade Brook
Snider Brook
Mineral Spring Brook
Le Clair Brook
Truland Brook
Burgess Branch
Calavale Brook
Miles
2.5

Upper Missisquoi & Trout Rivers Wild and Scenic Study Area

Restorable Wetlands

Restorable Wetlands in Study Area

Potential For Restoration

- **Low**
- **Moderate**
- **High**
- **Highest**

Rivers & Streams

Stream Order

4 5 6

Wild & Scenic Study Area

Study Area Towns

Restorable Wetland Data from Vermont NRCS, received August 2012.

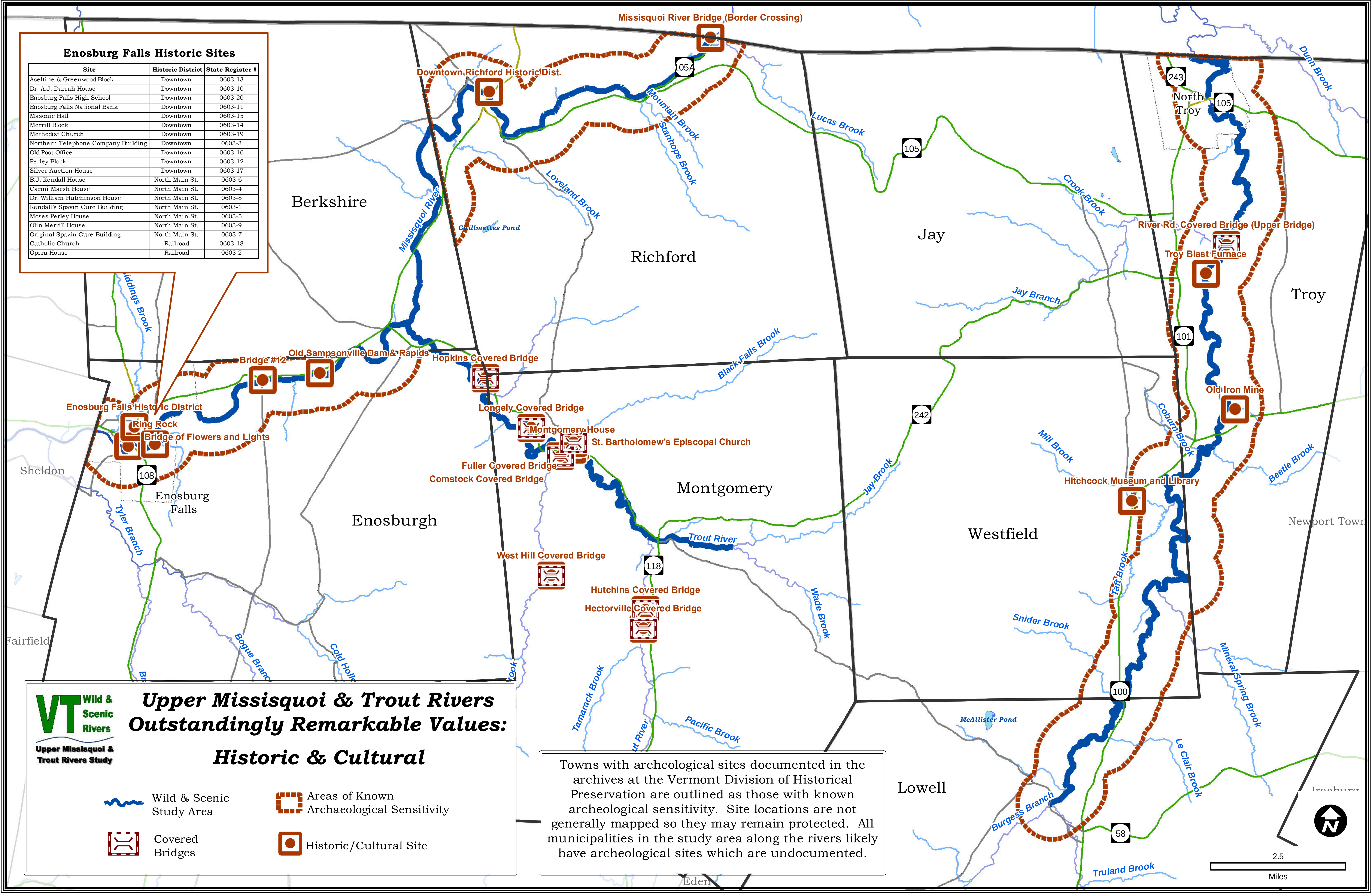
Berkshire
Richford
Jay
North Troy
Troy
NEWPORT TOWN
FRANKLIN
SHELDON
Enosburg Falls
Enosburgh
Montgomery
Westfield
Lowell
IRASBURG
EDEN
WATERVILLE

Lake Carmi
Carmi, Lake
Little Pond
Guillmettes Pond
McAllister Pond

Bike River
Mineral Brook
Missisquoi River
Giddings Brook
Tyler Branch
Loveland Brook
Mountain Brook
Stanhope Brook
Lucas Brook
Crook Brook
Jay Branch
Black Falls Brook
Jay Brook
Trout River
Wade Brook
Tamarack Brook
South Branch Trout River
Pacific Brook
Calavale Brook
Burgess Branch
Dunn Brook
Coburn Brook
Mill Brook
Beetle Brook
Taft Brook
Snider Brook
Mineral Spring Brook
Le Clair Brook
Truland Brook

105A 105 236 108 105 105 242 243 105 101 100 58 118

2.5 Miles



Enosburg Falls Historic Sites

Site	Historic District	State Register #
Aseltine & Greenwood Block	Downtown	0603-13
Dr. A.J. Darrah House	Downtown	0603-10
Enosburg Falls High School	Downtown	0603-20
Enosburg Falls National Bank	Downtown	0603-11
Masonic Hall	Downtown	0603-15
Merrill Block	Downtown	0603-14
Methodist Church	Downtown	0603-19
Northern Telephone Company Building	Downtown	0603-3
Old Post Office	Downtown	0603-16
Perley Block	Downtown	0603-12
Silver Auction House	Downtown	0603-17
B.J. Kendall House	North Main St.	0603-6
Carmi Marsh House	North Main St.	0603-4
Dr. William Hutchinson House	North Main St.	0603-8
Kendall's Spavin Cure Building	North Main St.	0603-1
Moses Perley House	North Main St.	0603-5
Olin Merrill House	North Main St.	0603-9
Original Spavin Cure Building	North Main St.	0603-7
Catholic Church	Railroad	0603-18
Opera House	Railroad	0603-2

VT Wild & Scenic Rivers
Upper Missisquoi & Trout Rivers Study

Upper Missisquoi & Trout Rivers Outstandingly Remarkable Values: Historic & Cultural

Wild & Scenic Study Area
Areas of Known Archaeological Sensitivity
Covered Bridges
Historic/Cultural Site

Towns with archeological sites documented in the archives at the Vermont Division of Historical Preservation are outlined as those with known archeological sensitivity. Site locations are not generally mapped so they may remain protected. All municipalities in the study area along the rivers likely have archeological sites which are undocumented.

VT Wild & Scenic Rivers

Upper Missisquoi & Trout Rivers Study

Upper Missisquoi and Trout Rivers Wild and Scenic Study
2839 Vermont Route 105
East Berkshire, VT 05447
info@vtwsr.org
www.vtwsr.org