CONNECTICUT RIVER
Corridor Management Plan

Volume V

Mt. Ascutney Region

CONNECTICUT RIVER
Corridor Management Plan

CONNECTICUT
RIVER
JOINT
COMMISSIONS

Volume V
Mt. Ascutney Region

Prepared by
Mt. Ascutney Region Local River Advisory Subcommittee
Edited by
Adair D. Mulligan of the Connecticut River Joint Commissions

Prepared for and dedicated to the Connecticut riverfront towns of:

Charlestown, Claremont, Cornish, and Plainfield,
New Hampshire

◆

Hartland, Rockingham, Springfield, Weathersfield, and Windsor,
Vermont

VOLUME I:
Riverwide Overview
VOLUME II:
Headwaters Region
VOLUME III:
Riverbend Region
VOLUME IV:
Upper Valley Region
VOLUME V:
Mt. Ascutney Region
VOLUME VI:
Wantastiquet Region

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Matt Brown of Lyme, New Hampshire
"Ascutney and the Connecticut"

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ABBREVIATIONS

AMPs	=	Vermont acceptable management practices
ANR	=	Vermont Agency of Natural Resources
BMPs	=	best management practices
CRJC	=	Connecticut River Joint Commissions, comprised of New Hampshire Connecticut River Valley Resource Commission & Vermont Connecticut River Watershed Advisory Commission
CSO	=	combined sewer overflow
DES	=	New Hampshire Department of Environmental Services
EPA	=	Environmental Protection Agency
EQIP	=	Environmental Quality Incentives Program of USDA's 1996 Farm Bill
FEMA	=	Federal Emergency Management Agency
FERC	=	Federal Energy Regulatory Commission
GIS	=	geographical information systems - a computerized mapping system
LRS	=	local river subcommittee
NEP	=	New England Power Company
NRCS	=	Natural Resources Conservation Service (under USDA), formerly the Soil Conservation Service
RSA 483	=	New Hampshire Rivers Management and Protection Act
RSA 483-B	=	New Hampshire Comprehensive Shoreland Protection Act
USDA	=	U.S. Department of Agriculture
USFWS	=	U.S. Fish and Wildlife Service
WWTF	=	Wastewater Treatment Facility

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A CITIZENS' PLAN FOR THE CONNECTICUT RIVER

The Mt. Ascutney region's plan is a blueprint for stewardship of the Connecticut River...for communities, landowners, businesses, and agencies on both shores. This plan was created by citizens who know their town and the Connecticut River. It represents the expertise of those who know this region as their home. Gathering together to create this plan for the Mt. Ascutney segment of the river were representatives from the towns of Plainfield, Cornish, Claremont, and Charlestown, New Hampshire and Hartland, Windsor, Weathersfield, Springfield, and Rockingham, Vermont.

The actions of one landowner or one town can affect both private property downstream and the quality of the waters we share. We can all be a big part of the river's problems and their solutions. Linked together as we are by the river, our care of the river should be coordinated - between towns, between states, recruiting all the players that affect the river. This plan provides a way for these players to work together as a team.

We believe that the vitality of the Connecticut River is economically important to our region. This plan encourages continued economic development that is compatible with the well-being of the river.

This plan is not an attempt to dictate to citizens and towns what they can and cannot do on the banks of the Connecticut River. Instead, this plan aims to stimulate stewardship and build partnerships across town lines, across the river, and across the array of interests of those who live and work on its banks.

ORIGIN OF THE PLAN

Seeking a local avenue for river decision-making, the Connecticut River Joint Commissions (CRJC) mobilized hundreds of valley residents and local officials to nominate the Connecticut River into the New Hampshire Rivers Management and Protection Program in 1991-2. Designation of the river allows local design of the river corridor management plan you hold in your hands. Working groups of local citizens proposed designations to portray the character of each part of the river, which would then guide the State of New Hampshire and the development of this plan. The majority of this segment is designated as a *rural river*, with a two mile section around Windsor designated as a *rural-community river*, and several miles in the vicinity of Bellows Falls Dam as a *community river*, as shown on page 6. More information about the New Hampshire Rivers Program can be found in Appendix A.

PLAN PARTICIPANTS
- the local river subcommittees

To ensure local leadership in implementing the New Hampshire Rivers Management and Protection Act on the Connecticut River, the CRJC established five advisory local river subcommittees, with the approval of the New Hampshire legislature. The Vermont legislature in turn directed its riverfront communities to participate on

these subcommittees. The CRJC asked the selectmen of all riverfront towns for nominations, and appointed two members and several alternates from each of the 53 New Hampshire and Vermont towns. Some 150 citizens have thus participated in the subcommittees' work.

Duties of the local subcommittees

Creation of a river corridor management plan has been the primary duty of the local subcommittees, delegated to them by the CRJC so that the plan could best respond to the changing character of the river and the varying interests and needs of valley citizens. The subcommittees are also empowered by RSA 483 to review and advise state agencies on permits that can affect the river. The subcommittees' leadership, planning, and expertise are local in nature, but their ideas now reach far beyond town boundaries as they advise the CRJC and state and federal agencies on river issues.

Mt. Ascutney Region River Subcommittee

The strength of the Mt. Ascutney Subcommittee's planning process lies in the diversity of its membership. These citizens, as directed by RSA 483, represent local business, local government, agriculture, recreation, conservation, and riverfront landowners. The Subcommittee also includes a regular participant who manages Bellows Falls Station, the major mainstem hydro dam in the Mt. Ascutney region. Therefore, the group is truly reflective of the region, representing many perspectives from both sides of the river. *All of the recommendations of the Mt. Ascutney Subcommittee's plan represent the consensus of this diverse group of citizens.*

PLAN PROCESS

The Mt. Ascutney Subcommittee has met monthly since January of 1993 to develop the Connecticut River Corridor Management Plan for this section of the river. The Subcommittee elected its own leadership and adopted rules of procedure. Meetings are always open to the public and have been held at the Windsor House on the second Tuesday evening of the month. The CRJC Communications Coordinator, who managed the five subcommittees' communications with each other, the CRJC, and various state agencies and organizations, transcribed the subcommittee's discussions to construct drafts of the plan, which the members revised and approved.

The Subcommittee members addressed a number of topics important to the river and the region. These are presented in the following chapters. For each topic, the Subcommittee has tried to identify current and potential problems, as well as opportunities, and has made recommendations which it believes represent a positive, consensus-based response to these problems. In many cases, recommendations for action in one chapter are repeated in another. For example, actions taken by farmers to save money on fertilizer can also improve water quality and benefit fisheries and recreation at the same time.

Scope of the plan - the river corridor

The Subcommittee has concentrated its planning upon the 39 miles of the Connecticut River in this segment, and the land adjacent to the river up to Route 12A on the New Hampshire side, and Route 5 on the Vermont side. These major roadways define the functional use of the river corridor and so were selected by the Subcommittee to simplify the planning process. While the recommendations of this plan are directed toward this area, the Mt. Ascutney Subcommittee believes that their consideration beyond the corridor could benefit the river, its tributaries, and the region as a whole.

A broader view

Many of the plan's recommendations are aimed beyond town boundaries, to guide state and federal agencies. The Mt. Ascutney Subcommittee recognizes that proper care of the river is such a big job, and such an important public duty, that help from beyond the watershed is sometimes appropriate and needed from those agencies which share responsibility for the river. The Joint Commissions pledge to honor the work of the local river subcommittees by pursuing the state and federal actions they recommend.

The CRJC also offer an overview of the issues and opportunities raised by the local groups, to bring a riverwide perspective to the plan. This overview is presented, along with summaries of the five subcommittees' work, in Volume I of this series.

Local adoption of the plan

It is the intent of the New Hampshire legislature through RSA 483 to empower each New Hampshire Connecticut riverfront community to adopt a locally-conceived means of conserving the river and its shoreline. The legislature sought also that "the scenic beauty and recreational potential of [the Connecticut River] shall be restored and maintained, that riparian interests shall be respected" without preempting the land zoning authority already granted to the towns.

The mechanism for adoption of this plan is the conventional local planning process. Planning boards and commissions can review the plan and adopt it internally as an adjunct to the local master plan, and select recommendations to bring to townspeople for approval.

Vermont towns are also encouraged to adopt this plan to make them equal partners with their New Hampshire neighbors in protecting their shared river resource.

Each New Hampshire riverfront town now has the opportunity to adopt appropriate recommendations of this Connecticut River Corridor Management Plan in lieu of the statewide Comprehensive Shoreland Protection Act (RSA 483-B), which prevails on rivers not included in the Rivers Program. The law is clear that "in the event that...the cities and towns along designated rivers or segments thereof do not adopt the proposals made by their local river management advisory committees, the house and senate shall re-examine the exemption provided... and propose minimum standards..."

Adopting the local plan instead of the statewide ordinance

Why adopt the Mt. Ascutney plan instead of the statewide ordinance? One is custom-built, the other is general. One is the product of discussion among Mt. Ascutney region citizens, and has been designed specifically for the Connecticut River and the people in this region. The other is the result of legislative action, a generalized set of rules created by state agencies for any river or lake in the state, whether it be the urbanized rivers of the Seacoast or some of the most scenic bass-fishing and kayaking water in

"We are trying to avoid unnecessary regulation with this plan."

Claremont city councilor

northern New England. The Mt. Ascutney plan and its guidance for state and federal agencies also gives an opportunity for a town to send a clear message about its preferences to outside authorities.

Therefore, New Hampshire towns along the Connecticut River have a choice that towns on other rivers do not have, but they must adopt either one or the other means of conserving the river.

The Connecticut River Joint Commissions

The Connecticut River Joint Commissions of New Hampshire and Vermont are advisory and have no regulatory powers, preferring instead to advocate and ensure public involvement in decisions that affect the river and its valley. The CRJC's broad goal is to assure responsible economic development and economically sound environmental protection.

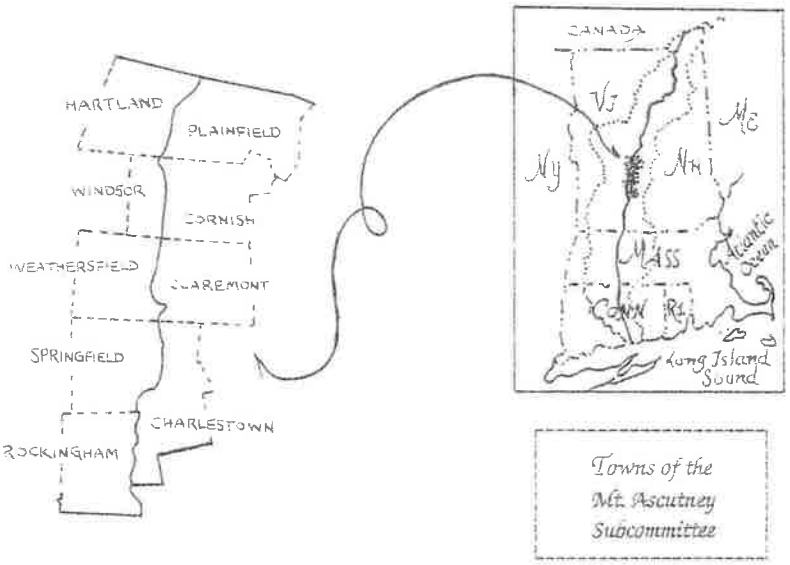
The thirty volunteer river commissioners, fifteen appointed by each state, are citizens who live and work in the valley and are committed to its future. The CRJC believe that the most effective action takes place when all the players come to the same table to achieve consensus. Members represent the interests of business, agriculture, forestry, conservation, hydropower, recreation, and regional planning agencies on both sides of the river. The Commissions hold a joint meeting each month, and are supported by three staff: the executive director, communications coordinator, and administrative assistant.

The New Hampshire legislature created the Connecticut River Valley Resource Commission in 1987 to preserve and protect the resources of the valley, to guide growth and development here, and to cooperate with Vermont for the benefit of the valley. The Vermont legislature established the Connecticut River Watershed Advisory Commission in the following year. The two commissions banded together as the Connecticut River Joint Commissions (CRJC) in 1989, and also achieved the status of a non-profit organization.

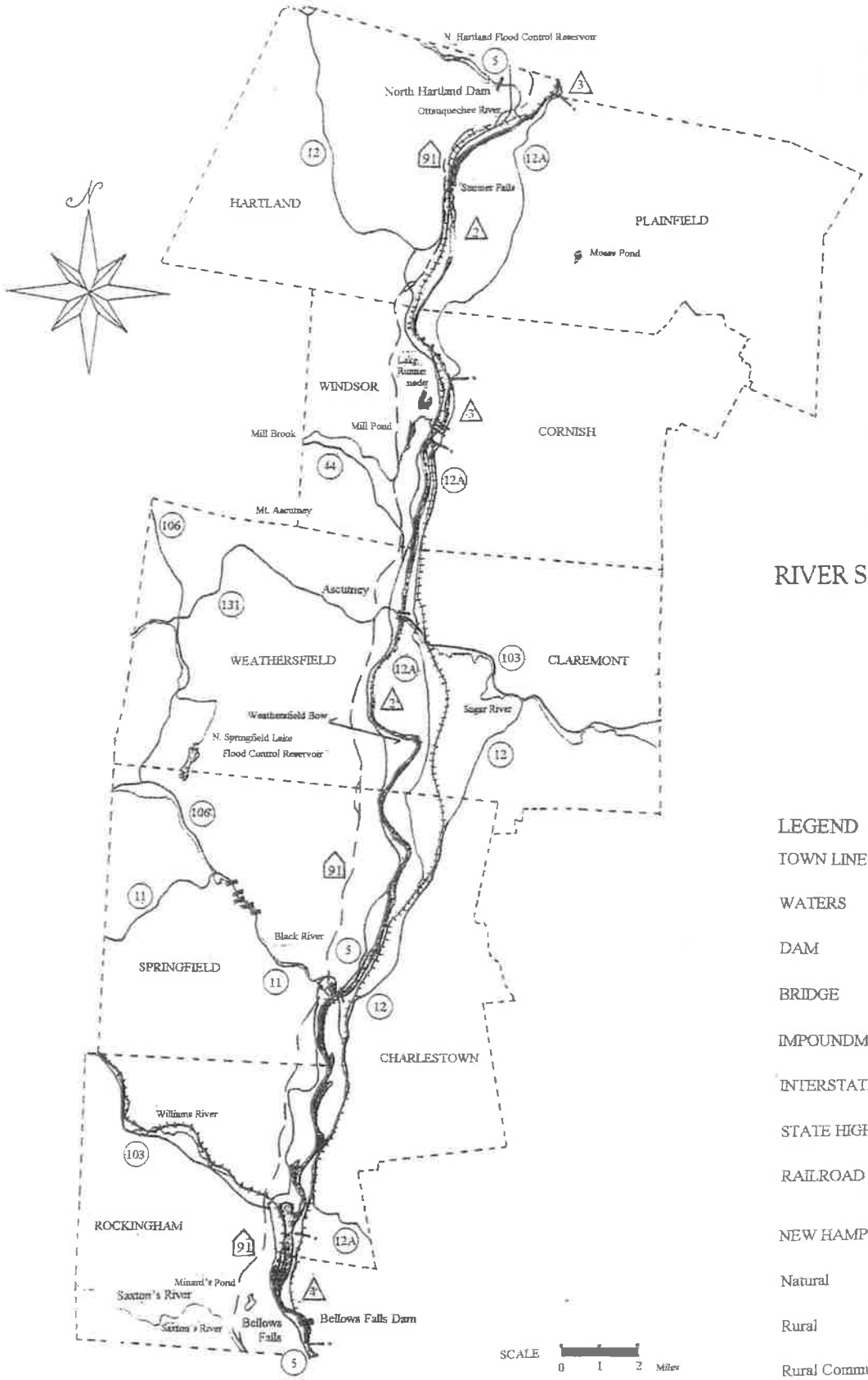
THE MT. ASCUTNEY REGION

For thousands of years, humans have been drawn to this part of the Connecticut River, establishing communities from the ancient Native American assemblages at Skitchewaug and the pioneering settlement of Fort No. Four to the modern industrialized centers of Claremont, Springfield, and Windsor. The Connecticut River Valley has offered fertile soils and the inspiration to feed fertile imaginations, yielding fine agricultural products, fine art, and fine machinery. Presiding over the river is the ancient monadnock of Mount Ascutney, the landmark chosen by the Subcommittee for its name. Spanning the river is the beloved Cornish-Windsor Covered Bridge, the longest wooden bridge in the United States.

The Mt. Ascutney Region River Subcommittee's segment covers 39 miles of the Connecticut River as it runs from the northern boundaries of Plainfield and Hartland south to the Bellows Falls Dam. The character of the river is distinctly different in the northern and southern sections of this segment. In the northern 18 miles the river is shallow and flows rapidly, dropping through the ledges at Sumner Falls and numerous other rapids and riffles. Below the Claremont-Ascutney Bridge, the river is deeper and more slow moving, impounded behind the hydroelectric dam at Bellows Falls. This 30' high dam at the foot of the segment includes a one half mile river bypass where the riverbed is almost dry. The 5400 acre impoundment has created stiller water and numerous setbacks, favorites of local and visiting fishermen. The flow of the river in this segment is also influenced by the Wilder Dam, just upstream. Major tributaries to this section of the mainstem are the Ottauquechee, Black, and Williams rivers and Mill Brook in Vermont, and the Sugar and Little Sugar rivers in New Hampshire. There is a number of dams on these and other, smaller tributaries to the mainstem.



Towns of the Mt. Ascutney Subcommittee



MT. ASCUTNEY RIVER SUBCOMMITTEE REGION

LEGEND

TOWN LINE

WATERS

DAM

BRIDGE

IMPOUNDMENT

INTERSTATE HIGHWAY

STATE HIGHWAY

RAILROAD

NEW HAMPSHIRE RIVERS PROGRAM DESIGNATION

Natural

Rural

Rural Community

Community

C. J. Sallen.
April, 1997

WATER QUALITY

QUALITY OF THE RIVER TODAY

The quality of Connecticut River water has improved vastly since 1951, when a government report listed the many thousands of homes discharging raw sewage and the hundreds of industries releasing untreated chemical wastes into the river. Today, thanks to the Clean Water Act and investments by the public and private sector, it is not only possible but enjoyable once again to fish, swim, and canoe in the river. Still, the Mt. Ascutney region's reach of the river carries nutrients, sediments, debris, and other forms of pollution delivered from upstream and by the tributaries.

In the northern ten miles of this segment, water moves with a perceptible current and there is an opportunity for flushing of nutrients and sediment. Rapids at Sumner Falls and other areas of riffle habitat provide for oxygenation of waters that may have assimilated nutrient contributions from upstream sources. The remaining 28 miles of the Mt. Ascutney segment is captured by the Bellows Falls impoundment which at maximum pool height reaches just south of the northern boundaries of Windsor and Cornish.

The Connecticut River is increasingly used for a variety of water recreation which depends upon clean water, including swimming, water skiing, kayaking, canoeing, boating, and fishing. River water is also suitable and used for agricultural and industrial water supplies, and a number of public and private wells are located near the river with the potential to draw upon groundwater that is associated with the river.

Habitat for fish and other aquatic life highly dependent upon excellent water quality is also a notable feature of this segment of the river, which is home to the dwarf wedge mussel, ruled as endangered on a federal level. The presence of this and other rare, threatened, and endangered species in this segment of the river has stimulated action by the U.S. Fish and Wildlife Service, the U.S. Environmental Protection Agency, and The Nature Conservancy, among other interested natural resource organizations, to improve water quality and other habitat values of the river here.

There are seven wastewater treatment facilities (WWTF), both municipal and industrial, discharging directly to the mainstem. In addition, seven other WWTF contribute their discharges to the Connecticut River via its tributaries. There are several combined sewer overflows remaining in the wastewater treatment system of Springfield, which can cause water quality problems during storms.

Results of water quality monitoring

The results of water quality monitoring in the Mt. Ascutney region are mixed. While the State of New Hampshire interprets the results of chemical sampling for dissolved oxygen and other parameters to identify no present water quality problems along the mainstem of the Connecticut River in this area, biological sampling of the benthic macroinvertebrate communities by Vermont shows the effects of significant nutrient enrichment. The Connecticut River mainstem in the Mt. Ascutney River Subcommittee area varies in gradient from Sumner Falls, where the river drops three feet at Hartland/Plainfield, to the flatwater impoundment behind Bellows Falls Dam. Areas of low gradient decrease reaeration capacity and therefore the ability of the river to

assimilate wastes. At Bellows Falls the river is bypassed for one half mile, and the historic riverbed is almost dry.

A number of small and large wetland areas are connected with the river, including at the mouth of the Black and Williams rivers and at Herrick's Cove. Riparian buffers, or filter strips of natural shoreland vegetation, remain in some locations.

The value of water quality

Good water quality is an important economic as well as aesthetic and ecological resource for the Mt. Ascutney region. Today the river is once again safe for canoeing, kayaking, boating, wildlife habitat, and productive fisheries. Its water quality is also important aesthetically to residential use and tourism. Studies by the states show that the Connecticut River mainstem in the Mt. Ascutney region is safe for swimming and other kinds of water contact except during and immediately after storm events, when bacterial contamination may occur. The water quality of the mainstem is acceptable for irrigation and industrial water supply, and there are at least seven registered water withdrawals on the New Hampshire side of the mainstem in this segment.

"There should be more equitable use of the river. Polluting uses should be discouraged."

real estate agent, Weathersfield

Conditions needed to sustain water quality

- separated treatment of sewerage and stormwater
- adequate river flow to flush pollutants and to support a healthy biological community
- nutrient and sediment input should be no greater than the river system can process without negative consequences
- maintenance of natural features such as riffles and cascades to help reaerate the water
- minimize nonpoint pollution from adjacent land uses and delivered by tributaries
- riverfront buffers to filter nutrients and sediments from adjacent lands

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CURRENT WATER QUALITY PROBLEMS

Organic matter and nutrients are entering the Mt. Ascutney reach from streambank soils, agricultural runoff, and tributaries like the Black and Sugar rivers. The slower water in the Bellows Falls impoundment may be enhancing the biological uptake of these nutrients and be partially responsible for the algal blooms seen in backwater areas, such as the mouth of the Black River, where heavy mats of algae sometimes discourage fishing, boating, swimming, and other enjoyment of the river during warm summer months and into the fall.

The variable flows and impoundment behind the Wilder Dam upstream of this section and the Bellows Falls Dam have the potential to encourage algal growth if nutrients are present and to depress oxygen levels due to temperature and water density layering effects, particularly because this segment has a relatively flat gradient and there are few free-flowing sections of riffles and cascades. Some nutrients are not flushed well in these impoundments.

The discovery of chromium and PCBs in fish tissue in this region suggests possible contamination of Connecticut River and tributary sediments with such metal and organic pollutants.

Tributaries

Both the Sugar and the Black rivers drain relatively densely developed industrial and residential areas. Data suggest that these tributaries are contributing to water quality threats and impairments reported for the mainstem of the Mt. Ascutney segment of the Connecticut River. Suspected potential sources of these pollutants in Vermont's Black River may be inadequate treatment at the Springfield wastewater treatment facility, straight pipes from older housing in Springfield, combined sewer overflows, and erosion, among others. Aquatic life in the Black River is dominated by pollution-tolerant species.

Data from biological monitoring of New Hampshire's Sugar River also indicate that this tributary is moderately enriched and perhaps overly productive. Toxicity testing of the effluent of the Claremont Wastewater Treatment Facility indicates that there may be an impact to aquatic life from this discharge, as well as from copper and lead from others further upstream.

"We've got to do something about the green slime. That Black River is part of the problem."

Springfield fisherman

Swimming

Nonpoint sources of bacteria, siltation, and the algal growth that increases with organic enrichment threaten water contact recreation along the Mt. Ascutney segment of the Connecticut River. Water quality monitoring by the Connecticut River Watch Program has uncovered bacterial problems, particularly following storm events, which restricts swimming and other such water uses below Lebanon/White River Junction and also in the Cornish/Windsor area and below Claremont/Ascutney. While the sources of these bacteria are not completely understood, the combined sewer overflows in White River Junction and Lebanon are suspected. While there is no evidence that water quality presents a hazard to swimmers in the mainstem in the Claremont or Charlestown sections of the river, or in the New Hampshire tributaries of Bloods Brook, Blow-Me-Down Brook, Chase Brook, the south branch of the Sugar River, or the Little Sugar River, there is evidence that bacterial contamination may limit swimming in the Sugar River in Claremont. The sources of this contamination are unknown.

Railroad

Railroad operations are a source of concern in the region. Passenger cars do not have holding tanks for their toilets. Since the railroad lines closely parallel the river in many locations, the raw waste emitted from railcar toilets poses a health and water quality hazard. Other concerns associated with the railroad are the creosote used on railroad ties next to river and removal of vegetation growing on the riverbank in the Bellows Falls area.

Other problems include:

- cumulative effects of potentially inadequate treatment of landfill leachate by wastewater treatment facilities, especially removal of heavy metals
- sedimentation from bank erosion
- some towns have and may still store their supplies of road salt on top of aquifers; there is concern about oversalting of roads in winter, which can pollute groundwater, wells, wetlands; some towns still dump snow in river
- brown foam in water in slow-moving areas
- soil contamination in Windsor
- runoff from commercial riverside development immediately upstream in West Lebanon delivers trash and probably other forms of contamination from parking areas to the Mt. Ascutney reach of the river
- runoff from roads and parking lots may contribute petroleum products, lead, and salt to the river

- residential use of detergents containing phosphorus and fertilizers applied by homeowners may contribute to nutrient enrichment and algal blooms

Potential water quality problems

- septic systems sited too close to the river could be exposed by erosion
- manure stored too close to the river could contaminate the water
- loss of water filtering and flood control through loss of wetlands during development
- downstream flooding aggravated by loss of wetlands to slow runoff
- potential equipment failures at WWTFs could release untreated wastewater into the river or tributaries
- runoff from expanded riverside commercial development and impervious surfaces upstream in West Lebanon could add pollutants and increase potential for downstream flooding and bank erosion
- spreading of biosolids from wastewater treatment facilities or paper industry byproducts on agricultural fields without adequate understanding of the nutrient budget of these fields
- human health hazard from giardia and other water-borne pathogens
- trash blowing into the river from nearby landfills
- contamination of an important aquifer by material leached from broken asphalt currently stored on top of it in Springfield
- potential abuse of existing drainage system at former Goodrich site
- potential for chlorine contamination from WWTF for Howard Johnson's in Springfield
- potential unknown dump sites

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OBJECTIVES

The Mt. Ascutney River Subcommittee wishes to see the many resources of the Connecticut River used and enjoyed as equitably as possible. Specific abuses of the river should be controlled. Water level manipulation should be better understood by the area's residents and better accommodate other uses and values of the river besides hydropower. Adequate current should be maintained in the river to avoid water quality degradation.

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RECOMMENDATIONS

FEDERAL GOVERNMENT

Environmental Protection Agency *should*:

- fund state agencies to monitor for toxic substances in the water, fish, and sediments

Federal Energy Regulatory Commission *should:*

- encourage public participation in hydro relicensing process
- seek a balance among competing uses of the Connecticut River

STATE GOVERNMENT *should:*

- continue and/or increase water quality monitoring activities
- control streambank erosion
- distribute accurate maps of aquifers and aquifer recharge areas to the towns as soon as they are available

- investigate the politics, economics, and water quality implications of biosolid applications on agricultural fields
- Vermont adopt setbacks for solid waste disposal that match New Hampshire's
- investigate means to limit addition of phosphorus to the river and tributaries
- provide education for road agents in salt use, snow dumping, and maintenance of roads, ditches, and culverts; enforce restrictions on dumping of snow in river
- warn the public in situations where a potential exists for release of untreated or partially treated wastewater.
- support City of Lebanon in completing an upgrade of its wastewater treatment facility to eliminate combined sewer overflows to eliminate bacterial contamination
- conduct dye tests to identify possible straight pipe discharges in Springfield
- support upgrade of Springfield wastewater treatment facilities
- require the railroad to equip all passenger car toilets with holding tanks and to dispose of creosoted railroad ties responsibly

TOWNS *should:*

- interview senior citizens to discover locations of old dumps, underground tanks, etc.
- discourage construction too close to the river
- avoid storing salt or other potentially polluting materials on their aquifers and adopt ordinance restricting salt use
- adopt provisions of NH Comprehensive Shoreland Protection Act for septic systems and consider increasing the minimum setbacks in order to preclude exposure of leach fields by erosion
- discourage wetland impacts during construction

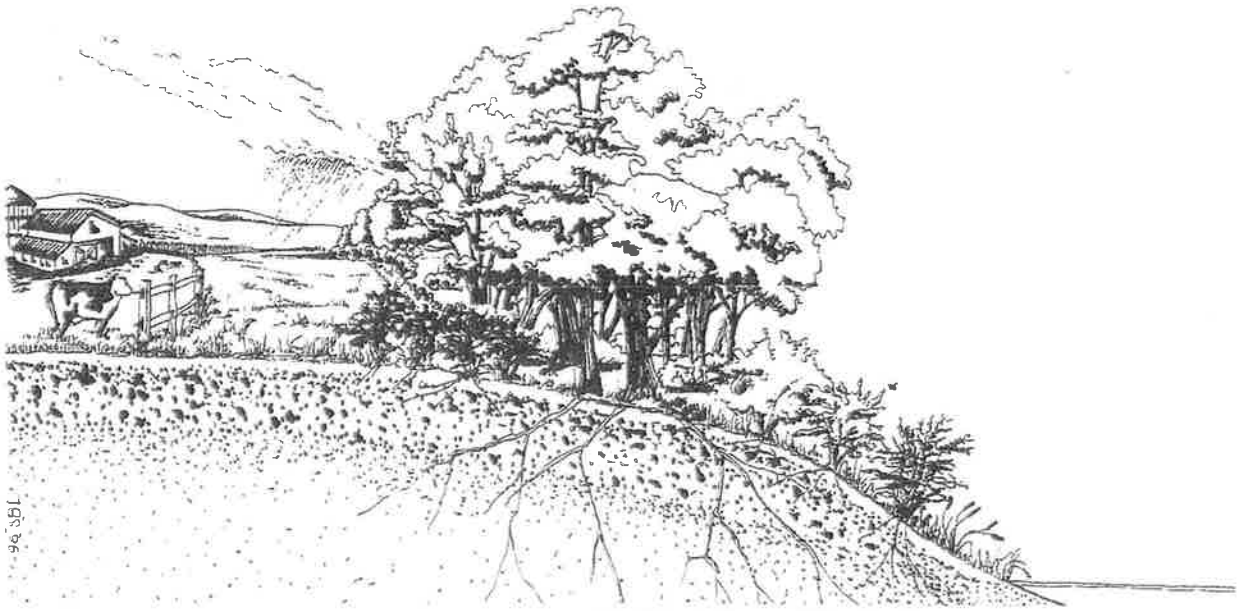
PRIVATE SECTOR

Landowners *should:*

- maintain or create riverfront buffers to capture nutrients and sediments washing off the land and to help stabilize banks
- avoid wetland impacts during construction

Farmers *should:*

- refrain from storing manure near riverbanks
- adopt best management practices for agriculture



REFERENCES AND FURTHER READING

Connecticut River Water Quality Assessment, NH Dept. of Environmental Services and VT Dept. of Environmental Conservation, 1994. Prepared for the CRJC with support from EPA, this bi-state assessment of the watershed is written for a non-technical audience and describes general and specific water quality issues on the Connecticut River mainstem and its tributaries. It answers seven questions regarding water quality for each subcommittee region: is river water drinkable? Can the fish be eaten? Are the existing dams contributing to a water quality problem? Is the river healthy from an aquatic life point of view? Can I safely swim in the Connecticut River? Can I use the water for water supply, irrigation, and other purposes? Can I discharge additional wastes to the river? It also answers the question of whether NH and VT contribute to the nutrient pollution of Long Island Sound. The report includes an extensive technical appendix and presents the states' strategies for correcting water pollution in the basin.

Along the Northern Connecticut River: An Inventory of Significant Instream Features, Connecticut River Joint Commissions, 1994. This inventory contains the available information relating to in-stream features of the Connecticut River mainstem for both sides of the river. It covers water quality features, such as location of water quality and streamflow gauging stations water withdrawals, and wastewater treatment facilities; river flow and riverbank features, such as dams, impoundments, and significant streambank erosion sites; and recreational features, such as whitewater segments, boat launch sites and campgrounds. Information is presented by local river subcommittee region both in tables and on GIS-based maps. An extensive annotated bibliography covers both technical publications and those focusing on Connecticut River history and travel. The inventory is also provided on a computer disk in the front of the notebook for easy reference. Designed to be user-friendly, it can be run on a personal computer using MS-DOS. The appendix includes instructions on how to operate the disk.

LIVING WITH THE RIVER SERIES of publications by the Connecticut River Joint Commissions:

A Homeowner's Guide to Nonpoint Source Water Pollution in the Connecticut River Valley, 1994. This booklet offers useful hints for homeowners on managing runoff, caring for septic systems, conserving water, and dealing with yard waste, bugs, and chemicals. It also offers alternatives for toxic household products and a directory of sources of help.

The Watershed Guide to Cleaner Rivers, Lakes, and Streams, Brian Kent, 1995. Liberally illustrated, this guide describes the causes of nonpoint pollution, suggests ways to reduce and prevent it from reaching waterways, and provides basic ideas that citizens can use to help improve water quality in the valley. The report covers a number of best management practices for construction sites, developed areas, backyards, septic systems, gravel and sandpits, marinas, farms, golf courses, woodlots, and storage of hazardous materials, and includes a useful directory.

A Citizen's Guide to River Monitoring in the Connecticut River Valley, Geoff Dates, River Watch Network, 1995. This user-friendly guide is intended to help people establish long-term, community-based, and scientifically credible river monitoring programs in the valley.

The Challenge of Erosion in the Connecticut River Watershed, 1996. A series of informational fact sheets on riverbanks and buffers summarize the findings of a year-long multi-agency investigation into riverbank erosion. Written for the riverfront landowner or interested citizen, they cover river dynamics and the many causes of erosion, riparian buffers, streambank stabilization techniques, field assessment of problem sites, and a guide to permitting requirements on each side of the river.

◆

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, NH Dept. of Environmental Services, 1994. This useful reference explains nonpoint source pollution and concisely covers the best management practices, current laws and regulations, and reasons for concern for the top ten land use activities which can cause pollution. Individual actions are highlighted, as well as current watershed protection and planning.

Native Vegetation for Lakeshores, Streamsides, and Wetland Buffers, VT Dept. of Environmental Conservation, 1994. This guide describes buffer strips and contains general considerations, native plant descriptions and maps of hardiness zones in VT for buffer strip enhancement.

New Hampshire Resource Protection Project, New England Interstate Pollution Control Commission and Environmental Protection Agency, 1995. This project is a cooperative endeavor among federal, state and local government agencies along with

private conservation and business interests. Its goal is to identify high priority natural resource areas in NH and assist in those regions' protection planning efforts. Using GIS technology, the study analyzed data on wildlife habitat, drinking water supplies, forestry, agriculture, recreation, and pollution threats. Six areas in NH were targeted for attention based on the value of their natural resources; two of the six are located in the area covered by this Plan: the Connecticut Lakes, and the river valley in the vicinity of Plainfield, Cornish, and Claremont.

MAPS

(GIS = Geographic Information Systems, indicates computerized database as source of map)
Series of GIS maps produced for the CRJC and the local river subcommittees by MicroDATA, with the support of VT Agency of Natural Resources, 1994. These same maps are presented in ***Along the Northern Connecticut River: An Inventory of Significant Instream Features*** *at a scale of 1:63,360*

Mt. Ascutney Region- Water Quality. Map displays NH Rivers Program segment designations, VT wastewater management zones, water quality sampling stations, gauge stations, point discharges, water withdrawals, hydro electric water use, municipal water supplies, surface waters, roads, and railroad routes for the towns of Plainfield/Hartland through Charlestown/Rockingham, scale 1:31,680

Mt. Ascutney Region- River Flow and Shorelines. Map displays dam sites, impoundment zones, and shoreline erosion distinguished as severe or moderate/unclassified, surface waters, roads, and railroad routes for the towns of Plainfield/Hartland through Charlestown/Rockingham, scale 1:31,680

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Highlights of the New Hampshire Natural Resource Protection Project, New England Interstate Water Pollution Control Commission and the Environmental Protection Agency, 1996. GIS maps prepared for each of the five CRJC local river subcommittees show agricultural lands, unfragmented natural lands and shorelines, high value freshwater wetlands, drinking water supplies and pollution threats, bald eagle wintering sites, conservation and public lands, and some natural heritage inventory sites.Scale varies. Copies of the maps have been provided to NH riverfront towns through the local river subcommittees.

Potential Conflicts with Connecticut River Water Quality, Southern Windsor County Regional Planning Commission, 1993. GIS map of area between Route 5 and the river in Windsor, Weathersfield, and Springfield, showing buildings and recreation sites, land use, and land cover in addition to surface waters, roads and railroads, and town boundaries. Scale 1:16,000

Connecticut River Basin Sampling Stations, NH Dept.of Environmental Services, 1994. Series of three GIS maps covering the entire watershed in NH and VT shows surface waters, sub-watershed boundaries, NPDES outfalls, and water quality sampling stations for the Connecticut River Watch Program, and NH DES, and the VT Dept. of Environmental Conservation. Scale 1:150,000

FISHERIES and AQUATIC HABITAT

LIFE TODAY BENEATH THE SURFACE

Aquatic habitat within the river provides areas for spawning, feeding, resting, and cover for sport and non-sport fish, and the macroinvertebrates and other life upon which they feed. The quality of this habitat is reflected in its physical, chemical, and biological characteristics. Bottom types vary from silt to sand to gravel, depending upon water flow and degree of scouring. The streambanks offer varying degrees of shading to keep the waters cool. The free-flowing section of the river at the north end of the segment, following the river's release from Wilder Dam, provides particularly valuable cold-water fishery habitat. The trout population is not strong, although browns, brookies, and rainbow can be caught. The lower 28 miles, impounded by the Bellows Falls Dam, offer an entirely different kind of habitat which supports a diverse warm water fishery.

Smallmouth bass concentrate on the gravel beds just upstream of the village of Ascutney. Largemouth bass beds occur in all setbacks, and the impounded section of the river has gained attention as a fine bass fishery, attracting bass tournament fishermen. Recent studies by New Hampshire show that the river's populations of both small and largemouth bass here are in good to excellent condition. Perch can be found throughout the segment and are a popular sport fish. Bullheads are common at Springfield. Anglers have observed that the walleye population has declined, prompting New Hampshire studies which indicate that although the river offers a good temperature regime for walleye, this population appears to be in generally poor condition, perhaps because the fish are competing heavily for available habitat and prey. The northern pike population is beginning to increase, and the pickerel population is considered adequate. The shiner population is notably high near the tollbridge, and other less significant species occur as described in the New Hampshire Resource Inventory.

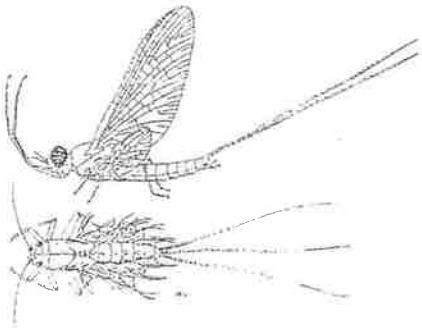
A study of aquatic macroinvertebrate communities, small organisms which reflect the quality of the water and provide food for fish, showed that the community is in good condition in the mainstem below the Mascoma River's confluence.

Both upstream and downstream passage for migrating fish is provided at the Bellows Falls Dam. Atlantic salmon gather below the dam, but rarely travel upstream from this point. The U.S. Fish and Wildlife Service has identified the Williams River to Brockway Mills Dam as nursery and rearing habitat for juvenile Atlantic salmon. American shad very rarely pass above the dam, which is consistent with their historic use of the river.

The warm water fishery of the Bellows Falls impoundment is enjoyed from the shore and from boats. Popular fishing areas include the mouths of the Black and Sugar rivers as well as the mouths of smaller tributaries. Submerged timber cribs dating from log drive days on the Connecticut River are also productive fishing spots. Winter ice fishing is popular on setbacks, particularly at the mouths of tributaries.

Tributaries

While the focus of this plan is the mainstem of the Connecticut River, the Mt. Ascutney Subcommittee recognizes that the tributaries provide key spawning and nursery areas for its fisheries, and that the quality and quantity of water delivered by the tributaries directly affects fisheries in the mainstem. The aquatic macroinvertebrate communities are in excellent condition in the Williams River where sampled 3 miles from its mouth, and in good condition in the Sugar River above its mouth. The biological community in the Black River is in overall fair-poor condition, due to loss of physical habitat and greater organic enrichment from erosion and discharges in the Springfield area. In this tributary, species which fare better in polluted conditions are replacing those which do not tolerate pollution.



Conditions needed to sustain fisheries... and the aquatic community upon which they depend

Vegetated streambank buffers help shade the water, minimizing temperature and oxygen variations, and providing more stable habitat for fish and other aquatic life. They also protect fish habitat by retarding erosion that leads to silting over of spawning beds, by trapping nutrients and sediment in runoff before they can reach the waterway. In general, the wider the buffer the more effectively it traps pollutants and sediment. Maintenance of high water quality is required for the survival of brook trout in particular.

Water level fluctuations in the impoundment must be effectively coordinated with critical fish spawning times. Both upstream and downstream passage for fish at the Bellows Falls and Wilder hydroelectric facilities are important in providing access to these stretches of the river for migrating and resident fish.

Potential improvements

Higher perch and bass populations may be possible with better management of water levels at spawning time. The walleye fishery could be very good with an increase in minimum catch size or perhaps with stocking. There is potential for a significant fishery for Atlantic salmon in both the tributaries and the mainstem, although this species is currently not returning to this region in any numbers or using historic portions of their habitat here for spawning. A catch and release fishery has potential.

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CURRENT PROBLEMS

An entire year of fish reproduction, particularly of bass, perch, and northern pike, can be lost if fish eggs are allowed to dry as a result of water level fluctuations or of drawdowns for dam repairs, without adequate coordination between dam operators and fish/wildlife agencies. Pool changes may be somewhat reduced by replacement of flashboards by panels at Bellows Falls Dam. The river bypass at the Bellows Falls Dam is one half mile, where no minimum flow requirements are imposed. River habitat becomes dewatered in this bypass reach.

Water temperature can rise in the impoundment as it is warmed by the sun and moves slowly through the setbacks and impounded mainstem. Water movement in this section varies in speed, with the result that nutrients and pollutants settling into deep holes, such as those below Wilgus State Park, and may not flush as effectively as they would in free-flowing sections. The opportunities for oxygenation are diminished here.

At times, prevailing southerly winds may actually blow surface waters upriver in the impoundment, perhaps carrying pollutants upstream. Organic enrichment appears to be impacting the aquatic macroinvertebrate population, and perhaps fish dependent upon them. Algal blooms, particularly at the mouth of the Black River, are a nuisance and contribute to depressed oxygen levels, reducing or eliminating habitat for species dependent upon well-oxygenated water.

Eurasian milfoil has recently been discovered at Hoyt's Landing, and could become a nuisance.

Bank erosion, which is severe in some places along this segment, is a major threat to aquatic life, and in particular contributes sediment which cover fish spawning beds. Sand and silt have embedded the lower sections of the Black River, limiting habitat there. This is most likely a problem in the mainstem as well. Boat wakes caused by water skiers and high-speed boats contribute to bank erosion with a subsequent impact upon fisheries. Sumner Falls has occasionally proven hazardous to fishermen who were caught by suddenly rising water.

The information below is drawn from the 1994 *Connecticut River Water Quality Assessment:*

- Connecticut River below Mascoma River: macroinvertebrate community rated as good, but shows the effects of moderate organic enrichment
- Ottauquechee River near mainstem: aquatic habitats are partially compromised
- Sugar River: at least a one mile section below the Claremont wastewater treatment facility only partially supports aquatic life; macroinvertebrate community rated as good; habitat is moderately enriched with organics and nutrients
- Black River near mainstem: macroinvertebrate community rated poor-fair, partly because embedded sand limits available habitat
- Potentially harmful concentrations of chromium have been noted in fish caught in the Connecticut River, and PCBs were elevated in yellow perch. As fish are regularly taken in this region for food, particularly perch and walleye, there is concern for the health risk posed by eating these fish.

Potential problem

Introduction of the zebra mussel could drastically alter the biological community of the river, and could also pose a significant nuisance to fishermen for boat maintenance.

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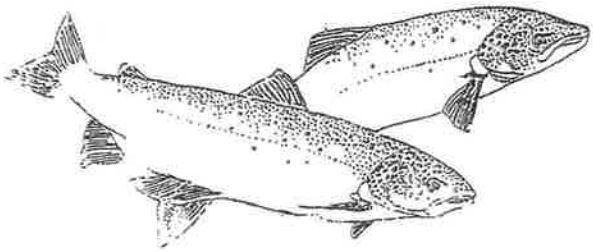
OBJECTIVES

The Mt. Ascutney Subcommittee seeks a strong, diverse fishery for both warm and coldwater fish, based on a healthy food web and aquatic habitat. The economic value of fisher tourism should not be overlooked.



RECOMMENDATIONS

FEDERAL GOVERNMENT

U.S. Fish and Wildlife Service *should*:

- integrate the management of Atlantic salmon with other local species

Federal Energy Regulatory Commission *should*:

- give as much consideration to recreation, fisheries, and aquatic habitat as to power generation during dam relicensing

STATE GOVERNMENT

State fish and game/wildlife agencies *should*:

- continue the fish community studies work recently begun
- work with New England Power Company and its successors to better coordinate water level management with fish spawning
- take action to improve walleye population
- stock tiger muskies to reduce population of juvenile sport fish
- explore the possibility of establishing a catch and release area
- integrate the management of Atlantic salmon with other local species
- encourage education of resident and visiting fishermen about the zebra mussel

State water quality agencies *should*:

- install a flow gauge near Springfield to allow better management of water level during spring spawning
- monitor toxicity in fish tissues, particularly chromium, PCBs, heavy metals
- protect rare remaining riffle habitat
- encourage planting, maintenance, and protection of streamside buffers to benefit both fish and wildlife
- maintain or improve water quality

TOWNS *should*:

- minimize erosion resulting from construction, farming, and other activities on the land wherever practicable to minimize turbidity and sedimentation

PRIVATE SECTOR

Dam operators *should*:

- work with state fish and game/wildlife agencies to better coordinate water level management with fish spawning

Landowners *should*:

- help protect fish habitat through protection of streambank buffers
- use best management practices for forestry and agriculture to limit nutrient and sediment runoff into waterways
- control bank erosion and minimize erosion resulting from construction, farming, and other activities on the land

Sportsmen's clubs *should*:

- cooperate with state agencies to provide information about fish populations
- promote use and protection of streambank buffers to improve water quality and fish habitat
- participate in the dam relicensing process

The public *should*:

- limit consumption of fish from the river as warranted by test results
- participate in the dam relicensing process (Bellows Falls:license due to be renewed in 2018)

REFERENCES

Connecticut River Water Quality Assessment, NH Dept. of Environmental Services and VT Dept. of Environmental Conservation, 1994.

Connecticut Valley Inventory, Vols. I and II, NH Connecticut River Valley Resource Commission (of the CRJC), 1989. Written in non-technical language, these two volumes are a source of basic information about the river and the NH side. Volume I covers corridor character, protected parcels, surface water quality, public access, boating suitability, fisheries, and endangered species. Volume II covers flood hazard areas and impoundments, aquifers, historic and archeological resources, and wildlife.

Silvio Conte National Fish and Wildlife Refuge Final Action Plan and Environmental Impact Statement, U.S. Fish and Wildlife Service, 1995. This extensive report details the findings of the Service in addressing Congress's direction to establish a wildlife refuge in the Connecticut River Valley, and describes the environmental and economic consequences of five alternative plans of action. In addition to description of the plant, fish, and wildlife resources of the watershed, the report identifies sources of funding assistance, technical support, public concerns and comments, and various management options for land, water, and public education. The report also describes "special focus areas" identified by the Service.

Black Bass Population Assessments in Region 4, NH Fish and Game Dept., 1996. Population studies of small and largemouth bass in the Connecticut River and several ponds in southwestern NH.

Connecticut River Walleye Population Assessment and Spring Angler Survey, NH Fish and Game Dept., 1996. Population studies of walleye in the Connecticut River.

MAPS

GIS maps produced for the CRJC and local river subcommittees in 1994 by the U.S. Fish and Wildlife Service Connecticut River Coordinator's Office:

Atlantic Salmon in the Connecticut River Watershed. Map shows the anticipated future fishery, current and future stocking and resting areas, and current and future migratory pathways for salmon in the four-state watershed.

American Shad in the Connecticut River Watershed. Map shows the current fishery, current and future stocking, spawning and resting areas, and current and future migratory pathways for shad in the four-state watershed.

Blueback Herring in the Connecticut River Watershed. Map shows the current fishery, current and future stocking, spawning and resting areas, and current and future migratory pathways for herring in the four-state watershed.

HABITAT

SHORELAND AND UPLAND HABITAT
in the Mt. Ascutney region today

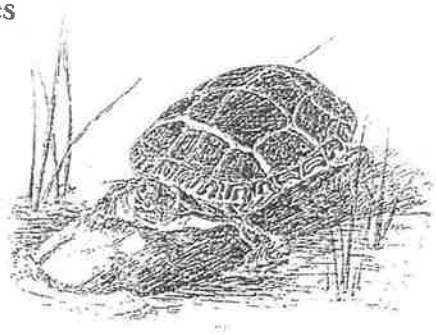
The Connecticut River and its corridor provide a home for many different kinds of plants and animals. Some of these, such as the beaver, the mallard duck, and the cattail, are common, occur widely, and are familiar to us all. These common species may occur along the river, but are also found in a variety of different types of habitats. Other species, however, have narrower ranges, and are primarily found in the special sorts of conditions that the river and its corridor provide. In some cases, the only occurrence of these plants or animals in Vermont or New Hampshire, or for some, the world, is along the Connecticut River in this region.The confluences of tributaries are also important places for fish and wildlife.

Migration corridor

The river functions as a corridor for migrant songbirds, waterfowl, and other species which take advantage of the slightly milder conditions near the river before passing into upland habitat as spring proceeds. In the fall, loons migrate along the river and are seen feeding just before the ice forms. Protecting the integrity of this habitat for those migrating birds which prey upon forest insects may well contribute to the health of forests in the region and beyond.

Ecologically significant community types

- floodplain forests
- rivershore grassland
- calcareous riverside seep community
- riverside outcrop community
- river cobble shore
- deep emergent marsh (cattail, bulrush, emergent aquatic plants)
- shallow emergent marsh (grasses, sedges, rushes)



Species of concern

- bald eagle (state status: endangered; federal status: threatened; fishing observed in ice-free waters around Sumner Falls, also spring and summer use along River Road in Plainfield, at mouth of Little Sugar River, and at Ascutney)
- dwarf wedge mussel (state, federal, global status: endangered; all known populations in the world occur along the Connecticut River in this segment)
- cobblestone tiger beetle (very rare, listed as threatened on state level)
- Jesup's milk vetch (state, federal and global status: endangered)
- osprey (threatened in New Hampshire; observed fishing in cove at Hoyt's Landing)
- peregrine falcon (federal and state status: endangered; observed feeding on pigeons at Springfield-Charlestown Toll Bridge)

The state Natural Heritage Inventory Programs have done extensive surveys of rare species and have developed a system to rank the degree of a species' rarity. This provides

a well thought out, nationally consistent system for setting priorities for protection. Our plan in general adopts the species rankings and classification of community types used by the state Natural Heritage Programs.

Connecticut River Rapids Macrosite

The region from Weathersfield Bow north to the mouth of the Ompompanoosuc River beyond the Mt. Ascutney Region has become informally known to biologists as the Connecticut River Rapids Macrosite, because of its concentration of ecologically significant habitats and its populations of rare, threatened, and endangered species, some of whom are recognized on a federal or even global level.

Habitat conservation

The Nature Conservancy, the Upper Valley Land Trust, the New England Wildflower Society, and the Connecticut River Watershed Council are among the private non-profit organizations which protect land in the corridor. The Silvio Conte National Fish and Wildlife Refuge has identified the Macrosite as a special focus area.

Riverfront farms

Riverfront farms are now considered particularly significant resources for some species of wildlife. Increasing numbers of wild turkeys are concentrated at riverfront farms, where most nest within 100' of pastures. Turkeys forage during the winter on crop residues left in fields.

Conditions needed to sustain good habitat

- protection of outstanding community types in order to maintain the particular environments required by the species inhabiting them
- free flowing river
- adequate forested buffers
- good forestry practices that minimize erosion and sedimentation
- minimal erosion and predominance of rocky banks in the northern part of the segment
- largely undeveloped river corridor
- oxygen-rich water because of turbulence from passage over riffles and cascades
- good water quality entering the segment
- minimal disturbance by power boats
- good stewardship by New England Power Company and its successors

Potential habitat improvements and uses

More residents and visitors to the Mt. Ascutney region could enjoy birdwatching, ecotourism, educational field trips, and low impact recreation. The Mt. Ascutney reach of the Connecticut would be a valid site for habitat conservation and scientific research. The region could benefit greatly from the interest of the U.S. Fish & Wildlife Service and the Environmental Protection Agency in the Connecticut River Rapids Macrosite and their potential contributions to its long term conservation.

Habitat conservation could lead to a return of the Puritan tiger beetle, a species originally described from specimens taken at Charlestown.

CURRENT PROBLEMS

- water quality concerns in the mainstem and tributaries
- instream habitat loss due to embedding by eroded bank materials
- riverbank habitat loss to stabilization with riprap
- variable water levels may temporarily or permanently eliminate instream and shoreline habitat; draining of setbacks disturbs habitat
- trampling of populations of Jesup's milk vetch at Sumner Falls by river users

Potential problems

- fragmentation and loss of significant habitat through development
- over use of rare species habitat
- heavy traffic by power boats in the Macrosite area
- development of marinas
- introduction of zebra mussel, which could severely impact endangered dwarf wedge mussel populations

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OBJECTIVES

The primary focus of efforts in wildlife and plant conservation should be to protect and maintain populations of rare and threatened species while maintaining common species as well. While more common species can find many places to live, those restricted to Connecticut River habitats can only be found here along the river. It is both our opportunity and our responsibility to provide for the future of these rarer plants and animals, for we can play a major role in their survival.

A community level conservation strategy is more efficient and cost effective than one which focuses upon individual species. Many of the total number of species present in an area can be preserved by maintaining good examples of the major community types. These groups of species require many of the same physical conditions, and occur close to each other. Protecting these communities serves to maintain the particular environments which they require. Emphasize actions and policies which will maintain these ecologically significant communities.

Most of the property along the river is owned by individual landowners who have in the past and will continue in the future to play a key role in habitat conservation.

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FEDERAL GOVERNMENT

Federal Energy Regulatory Commission *should*:

- avoid further impoundment of the river

U.S. Fish and Wildlife Service *should*:

- examine the impact of water flow regime upon habitat
- encourage collection of information on habitat and species
- provide education for local conservation and planning commissions, outfitters, citizens; prepare a video program on the area and its habitat
- enter into cooperative agreements with willing landowners through the Silvio Conte National Fish and Wildlife Refuge
- provide cost-sharing grants for habitat conservation through the Partners for Wildlife Program

STATE GOVERNMENT

Water quality agencies *should*:

- encourage vegetative bank stabilization along the river and minimize the use of riprap
- discourage impacts upon wetlands
- discourage gravel mining in the river
- provide grant assistance to regional planning commissions to help interested towns develop river conservation districts and other provisions which protect natural communities and rare species populations along the river

Fish and wildlife/game agencies *should*:

- avoid construction of new power boat launches in Macrosite area
- examine impact of water flow regime upon habitat, and participate in hydro relicensing

TOWNS *should*:

- consider developing river conservation district and other provisions which protect natural communities and rare species populations along the river
- encourage cooperation and local partnerships among private landowners and non-profit organizations which can provide assistance in preserving/maintaining natural communities
- support the maintenance of natural features along the river
- discourage construction of new power boat launches in Macrosite area
- learn about species of concern within the town
- develop management plans for town-owned conservation areas
- encourage landowners and road agents to use vegetative bank stabilization and minimize use of riprap and other "hard" solutions where bank erosion is a problem

PRIVATE SECTOR

Landowners (including the railroad) *should*:

- support the maintenance of natural features along the river
- maintain vegetated riverside buffers which stabilize the riverbanks
- choose vegetative bank stabilization over riprap and other "hard" solutions where bank erosion is a problem
- avoid impacts to wetlands
- learn to recognize species of concern and report occurrences to state Natural Heritage Inventory program

New England Power Company and its successors *should*:

- continue to be aware of their stewardship role under existing licenses

The larger business community of the region *should*:

- support heritage tourism and ecotourism in the area
- assist with appropriate literature for visitors interested in natural history

Non-governmental organizations *should*:

- set up, maintain designated primitive canoe campsites to avoid disturbance of significant riparian habitat by campers; provide adequate signage including distance to next site to discourage emergency camping at locations of fragile habitat
- examine impact of water flow regime upon habitat, and participate in hydro relicensing; foster good stewardship by New England Power Co.

Citizens *should*:

- learn to recognize species of concern and report occurrences to state Natural Heritage Inventory program
- support public expenditures to protect habitat along the river

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REFERENCES

Silvio Conte National Fish and Wildlife Refuge Final Action Plan and Environmental Impact Statement, U.S. Fish and Wildlife Service, 1995. This extensive report details the findings of the Service in addressing Congress's direction to establish a wildlife refuge in the Connecticut River Valley, and describes the environmental and economic consequences of five alternative plans of action. In addition to description of the plant, fish, and wildlife resources of the watershed, the report identifies sources of funding assistance, technical support, public concerns and comments, and various management options for land, water, and public education. The report also describes "special focus areas" identified by the Service.

New Hampshire Natural Heritage Inventory, NH Department of Resources and Economic Development, 1995. Listing of plant and animal species and plant communities of special concern in each NH town along the Connecticut River, their rarity rank on a global and state level, listing under the federal Endangered Species Act, date last observed, and USGS quadrangle map.

MAPS

GIS maps produced for the CRJC and the Mt. Ascutney Subcommittee in 1994 by the U.S. Fish and Wildlife Service Connecticut River Coordinator's Office:

Communities, Mt. Ascutney Region. Map showing the general location of unidentified biological communities of concern and their rarity within the watershed, in all the watershed towns in the LRS region. Accompanied by descriptive listing of these communities and their rarity rank on a state, watershed, and global scale, location unidentified. Scale 1:100,000

Plants,Mt. Ascutney Region. Map showing the general location of unidentified plant species of concern and their rarity within the watershed, in all the watershed towns in the LRS region. Accompanied by descriptive listing of these species and their rarity rank on a state, watershed, and global scale, location unidentified. Scale 1:100,000

Wildlife, Mt. Ascutney Region. Map showing the general location of unidentified wildlife species of concern and their rarity within the watershed, in all the watershed towns in the LRS region. Accompanied by descriptive listing of these species and their rarity rank on a state, watershed, and global scale, location unidentified. Scale 1:100,000

Bald Eagles in the Connecticut River Watershed. Map shows bald eagle use areas in the four-state watershed.

Waterfowl in the Connecticut River Watershed. Map shows waterfowl use areas in the four-state watershed.

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Connecticut River Rapids Macrosite, The Nature Conservancy, 1994. Draft GIS map prepared for US Fish and Wildlife Service and Connecticut River Rapids Macrosite Committee, showing state and federally listed and candidate species, some protected lands, and potential pollution sources in the watershed region from the mouth of the Ompompanoosuc River to Weathersfield Bow. Scale 1:100,000

RECREATION

ON AND ALONG THE CONNECTICUT RIVER

The river's return from years of pollution and the transformation wrought by construction of dams has completely altered the values of the river and the expectations of valley visitors and residents in the Mt. Ascutney region. Swimming, fishing, boating, camping, hiking, bicycling, and wildlife observation along a cleaner, more appealing river are now widely enjoyed recreational activities. The Bellows Falls impoundment provides deeper water throughout the season for summer motor boating and angling for warmwater fish, and many people enjoy ice fishing in the setbacks during the winter. The river corridor remains a favored scenic route for auto touring.There are few recreation trails within the corridor, but a number exist nearby, of which the trails up Mt. Ascutney are perhaps most popular.

This section of the river is notable for several cascades and gorges on the mainstem and its tributaries. The ledges at Sumner Falls between Hartland and Plainfield is the best known. North Hartland Falls on the Ottauquechee River, 1/4 mile upstream from the Connecticut River, and Lull's Brook Gorge in Hartland are other appreciated natural features. The Great Falls at Rockingham, now partly obscured by the Bellows Falls Dam, are still impressive.

Boating

The entire segment of the river from Sumner Falls to Wilgus State Park is prime canoeing and kayaking water. Flows in the northern section are dependent on releases from the Wilder Dam, and the river may be quite shallow in places in times of low flow, although the current is always swift. Nevertheless, this section is very popular with canoeists who savor the river's character and the attractive scenery on the shores. The Sumner Falls area offers numerous opportunities for advanced paddlers of canoes and kayaks to play and practice in heavy whitewater, but is a significant and dangerous barrier for the casual canoeist. There is a portage on the Vermont side on New England Power Company land, a site often used as a starting or ending point for day trips. The area is fairly heavily used by boaters from the Ledyard Canoe Club at Dartmouth and other local paddlers on weekday afternoons and evenings and on weekends.

In the Claremont area and below, the river is well used by powerboats as well as canoes. The access at Hoyt's Landing in Springfield is one of only three sites in the state of Vermont which are accessible to persons with disabilities. There are two marinas in the region, one off-river in Charlestown, and another on the river in Rockingham. All gas facilities are currently located away from the river.

The Herrick's Cove area of the Connecticut River has hosted the region's largest antique steamboat rally, and offers potential economic benefits derived from this river- and heritage-based recreational activity. Steamboats are an historic form of transportation on the river which offer the added advantage of producing little or no wake to impact the riverbank.

River access

There are 9 boat launches open to the public in this segment:
(river miles are measured from the Massachusetts border)
Hartland: Sumner Falls; New England Power Co. (mile 72)
VT Fish and Game access (mile 69)
Lull's Brook (mile 68.9)
Cornish: Cornish Boat Landing (mile 65)
North Star Livery (mile 62)
Claremont: Claremont State Park (mile 55)
Springfield: Hoyt's Landing; VT Fish and Wildlife Dept. (mile 47)
Charlestown: Charlestown Boat Landing, New England Power Co. (mile 45)
Rockingham: Herrick's Cove, New England Power Co. (mile 41)
In addition to these sites, there are numerous private accesses.

Public camping sites and campgrounds

Plainfield:
primitive canoe campsite at Burnap's Island, Upper Valley Land Trust (mile 74)
Windsor:
primitive canoe campsite at Burnham Meadow, Upper Valley Land Trust (mile 68)
Weathersfield:
Running Bear Camping Area (mile 61); Wilgus State Park (mile 59)
Charlestown:
primitive canoe campsite at Lower Meadow, Upper Valley Land Trust (mile 41)
two small campsites, Student Conservation Association, (mile 52)
Springfield: KOA (mile 51); Crown Point Camping Area and Tree Farm Campground, located nearby on the Black River

Other recreational opportunities

Hartland, VT: Hartland has four major properties (two public, two private) within the river corridor that provide recreation and open space amenities for the town. The North Hartland Flood Control Dam on the Ottauquechee River, just upstream of the confluence with the Connecticut River, is the largest recreation area in the town. This 570 acre area, plus an additional 160 acres in easement, provides swimming, fishing, and boating. Picnic areas and the open space around the

dam are also available for public use. The Fish and Game area at the mouth of Lull's Brook consists of 27 acres, but at present affords only rather difficult access to the Connecticut River. The access area at Sumner Falls, kept open by the New England Power Company, is heavily used by picnickers, canoeists, kayakers, and anglers. Trails include VAST snowmobile trails near the river and a network of cross-country ski and equestrian trails. The play ground areas at the schools in North Hartland and Three Corners are used intensively.

Plainfield, NH: River Road and Route 12A are used by walkers, joggers, and the occasional equestrian. These roads also offer a primary corridor for bicycling, as part of a loop that includes Bellows Falls, and bicycle tours use these roads in summer and fall.

Windsor, VT: A variety of historic and cultural sites are found in Windsor, linked and interpreted by a walking tour. The Windsor Country Club is a privately owned golf course located in the northern part of town. The Blue Ridge Riding Stable is privately owned and located in the southern part of town. Paradise Park's 140 acre nature preserve offers hiking and cross-country skiing. Runnymede Pond has limited access, while Kennedy's Pond has a public swimming area.

Cornish, NH: Ballocks Crossing offers sleigh rides and hay rides. Saint-Gaudens National Historic Site offers hiking, outdoor concerts, and historical tours. There is a boat launch just north of the covered bridge for cartop boats. This area is one of the most popular riverside photo stops for bridge viewers. Route 12 A is frequently used by bikers and joggers. The River Road is popular for horseback riding from the Wade Estate north. Chase Island, a 20 acre island owned by NH Fish and Game Dept., has an informal campsite monitored by a nearby canoe livery operator, where canoe and raft rentals are available.

Weathersfield, VT: Camping, picnicking, and a canoe access are offered at Wilgus State Park. Mt Ascutney State Park offers a popular set of hiking trails to the summit, which affords a remarkable view of the river valley, and a campground. A private campground is located just north of the village of Ascutney on Route 5, and another may be developed just south of the village.

Claremont, NH: Some people camp on Hubbard and Jarvis Islands, and cross-country ski on Jarvis Hill. People also enjoy observing game animals, turkeys, song birds, aquatic wildlife, and migratory birds. A boat access and state park have recently been established across from Weathersfield Bow.

Springfield, VT: Hoyt's Landing offers boat access and a picnic area. Meeting Waters YMCA Camp abuts town forest land, and the schools offer recreation at their athletic fields. Birdwatching is popular at Herrick's Cove, where there are marked trails above the Springfield flood control area. A friends group has recently formed to benefit the cove.

Charlestown, NH: New England Power Co. maintains a picnic area and boat landing. Next to Fort No.4, a major tourist attraction, is the town's Patch Park, with athletic fields and a picnic area near abeach. The boat club's stairway providesboat access. The town's Tourism Committee is developing hiking and biking trails in Hubbard Hill State Forest.

Rockingham, VT: Recreational opportunities in this town include: the Bellows Falls Country Club, municipal ski tow, playgrounds at the Central and Saxtons River elementary schools and on Wells Street, Saxtons River recreation area, New England Power Company's recreation area at Herrick's Cove, a skating rink and ballfield at Vermont Academy, the Polish American Club picnic grounds, the Hitormis Gun Club, Bellows Falls Dam fish ladder, and scenic Green Mountain Flyer excursion train rides. Hiking and cross-country skiing are enjoyed at the Bellows Falls Municipal Forest.

Key conditions to support recreation

- continued maintenance of boat access presently owned by New England Power Company, particularly at Sumner Falls
- adequate, managed access to the river
- continued enforcement of boating laws, particularly with new access at Claremont
- water quality suitable for swimming and other water sports
- river users must be good stewards of the river
- road conditions which permit residents and visitors to enjoy the rural beauty of the region at a reasonable pace
- adequate parking at boat launches
- adequate parking for viewing Cornish-Windsor Covered Bridge
- safe travel for bicyclists
- preservation of historic structures which add to the scenic beauty of the region

Potential recreational opportunities

- access for cartop boats and foot traffic at Plainfield and Windsor, with adequate parking
- kayaking competitions at Sumner Falls
- biking or walking paths within the corridor

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CURRENT PROBLEMS

Water quality is diminished after storms due to combined sewer overflows at sewage treatment plants upstream and from nonpoint sources, making swimming unsafe. Boaters report a noticeable odor which detracts from the boating experience. Heavy growth of algae by midsummer, particularly at the mouth of the Black River, is also a nuisance. *Other problems include:*

- lack of adequate enforcement of existing boat speed law
- waterskiing is inappropriate in this segment of the river because of its narrow width
- a persistent trash problem on the riverbank at Windsor is unsightly from the water and from the Cornish-Windsor Covered Bridge
- litter problems in the vicinity of boat landings
- vandalism at access points, particularly at Hoyt's Cove and Sumner Falls
- danger for boaters at Sumner Falls
- Eurasian milfoil, recently discovered at Hoyt's Landing
- bank erosion
- large logs floating in the river present a safety concern for boaters

"When the river is very slow it gets the smell and brown foam, and it's not very pleasant to swim."

riverfront landowner, Plainfield

Potential challenges

- possible conflicts between canoeists and power boats
- use of jetskis north of the Ascutney bridge, where the river is too narrow for travel above headway speed
- potential conflict between agriculture and river access if parked boaters' cars interfere with the movement of farm equipment
- potential conflict over parking at Hoyt's Landing between boaters and cyclists, should a cycling rally there tempt participants to leave their cars at the boat access lot
- potential water quality, safety, and bank erosion threats from an on-river marina. The river's depth, width, flow, and fluctuating level in this segment does not favor

development of instream marinas.
- the issue of camping requires more study
- problems for all river users posed by zebra mussel infestation

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OBJECTIVES

The Mt. Ascutney River Subcommittee wishes to see the many resources of the Connecticut River, including recreation, used and enjoyed as equitably as possible by the people of the valley, both residents and tourists. Water level manipulation should be better understood by the area's residents and better accommodate other uses and values of the river besides hydropower.

RECOMMENDATIONS

STATE GOVERNMENT

NH Dept. of Safety *should*:

- increase enforcement of boating speed laws

Fish & game/wildlife and recreation agencies *should*:

- State of NH provide signage and handicapped access at the state launch and park in Claremont
- State of NH consider establishing primitive campsite at Chase Island; identify possible archeological or natural heritage inventory sites and confer with appropriate agencies on siting and management plans
- State of VT better maintain the portable toilet facilities at its river access points
- increase parking facilities at access points
- educate visitors to the region

Departments of transportation *should:*

- provide limited signage at river access points which is aesthetically in keeping with the rural nature of the region
- improve bicycling safety

Departments of forestry *should*:

- enforce slash cutting laws on riverbanks

TOWNS *should*:

- Windsor should take action to clean up dump on riverbank north of Cornish-Windsor covered bridge
- Windsor and Plainfield should study appropriate locations for foot and cartop boat access
- discourage construction of new marinas on the river

PRIVATE SECTOR

New England Power Company and its successors *should*:

- continue to maintain Sumner Falls access open to the public; provide more detailed signage here to indicate the level of skill needed to safely negotiate the rapids
- discontinue its informal policy of keeping water levels higher during weekends, when boat wakes are likely to create or worsen bank erosion by attacking more vulnerable parts of the riverbank
- provide limited signage at its river access points, especially Herrick's Cove; signage should be aesthetically in keeping with the rural nature of the region
- avoid using sirens to warn of rising water levels; this detracts from the character of the area and will disturb area residents
- work with CRJC and other organizations to improve enforcement of boat speed laws to diminish bank erosion

Connecticut River Joint Commissions *should*:

- work with New England Power Co., its successors, and other organizations to improve enforcement of boat speed laws to diminish bank erosion

Upper Valley Land Trust *should:*

- monitor use of campsites, particularly on potentially sensitive islands; if high camping pressure is noted on Burnap's and other islands, work with NH Fish and Game Dept. to establish campsite on Chase Island
- add signage to canoe campsites to show distance to next campsite to avoid overuse
- before establishing canoe campsites, identify possible archeological or natural heritage inventory sites and confer with state agencies on siting and management plans

Citizens *should:*

- obey existing boat speed laws
- avoid littering at access sites and along riverbank; participate in volunteer cleanups
- support forestry guidelines that discourage slash near riverbanks
- refrain from water skiing north of Ascutney bridge

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REFERENCES

Along the Northern Connecticut River: An Inventory of Significant Instream Features, Connecticut River Joint Commissions, 1994. This inventory contains the available information relating to in-stream features of the Connecticut River mainstem for both sides of the river. It includes recreational features, such as whitewater segments, boat launch sites and campgrounds. Information is presented by local river subcommittee region both in tables and on GIS-based maps. An extensive annotated bibliography covers both technical publications and those focusing on Connecticut River history and travel.

Findings to Support Classification of Segments of the Connecticut River, Connecticut River Valley Resource Commission, 1991. These findings, prepared with the help of citizens along the length of the river, nominated 34 specific segments of the river in several categories for classification and instream protection through the New Hampshire Rivers Management and Protection Program.

A Guide to the Connecticut River Primitive Campsites, Upper Valley Land Trust, 1996. Map and description of a system of 17 campsites along the river.

MAPS

Mt. Ascutney Region- Recreation, MicroDATA, 1994. GIS map produced for the CRJC and the Mt. Ascutney Subcommittee with the support of VT Agency of Natural Resources. Displays surface waters, roads, railroad routes, public boat launch sites, campgrounds, waterfalls and cascades, and whitewater segments for the towns of Hartland/Plainfield through Rockingham/Charlestown, scale 1:31,680

Northern Connecticut River, Canada to Massachusetts - 150 Foot Buffer Zone, MicroDATA, 1994. GIS map produced for the CRJC showing all NH and VT riverfront towns. Displays restricted boat speed zone within 150 feet of shore, and areas greater than 150' from shoreline, surface waters, roads, and railroad routes. Scale 1:100,000

AGRICULTURE & FORESTRY

Valuable soils

Some of the best soils in New England are found along the Connecticut River corridor, including the Mt. Ascutney region. There are few if any stones, making these soils outstanding for cultivation. Light, sandy soils can be worked early in the spring. The temperate climate of the riverside environment gives the area an extended growing season, with an early final frost in spring and late killing frost in fall. Extensive flat, tillable land is a rare resource in the states of Vermont and New Hampshire. The corridor's agricultural lands are also a key element in the long views and fall foliage attractions of the river valley for visitors to the two states. There are few experiences to match that of picking your own crisp apple on a bright autumn day at a riverfront farm.

Local products

Dairying remains the predominant agricultural activity on riverfront lands today, still a strong element of the rural landscape. Pick-your-own operations (currently strawberries, apples, pumpkins, and other fruits) and farm stands provide local markets and bring the non-farming public to the point of production. A number of Mt. Ascutney region farmers open their farms for tours, helping to convey a direct on-site understanding of farms and their value for dairy, maple, fruit, vegetable, and greenhouse production.

Forestry and silviculture

Christmas tree farming continues in the corridor, and some of the best pine stands in the area are on the light soils near the river.

FARM AND FOREST LAND USE IN THE RIVER CORRIDOR

Hartland, VT: The Lemax Farm is a major and highly visible farm which has been protected by the Upper Valley Land Trust.

Plainfield, NH: Plainfield's scenic riverfront area is entirely open space. The northern half of the town's river corridor is primarily agricultural while the southern portion is primarily forested with scattered houses. One section of woodland is owned by the New England Wildflower Society.

Windsor, VT: The most important open space is located on Redick's Farm which has a field of approximately 160 acres.

Cornish, NH: Virtually the entire eastern side of the river through the town of Cornish is sparsely built on and is therefore open space.

Weathersfield, VT: South of Wilgus State Park, most of the land is agricultural. A farm on Weathersfield Bow is protected by an easement, as is some other agricultural land. The slopes of Mount Ascutney are forested and are significant for the river even though they are outside of the corridor.

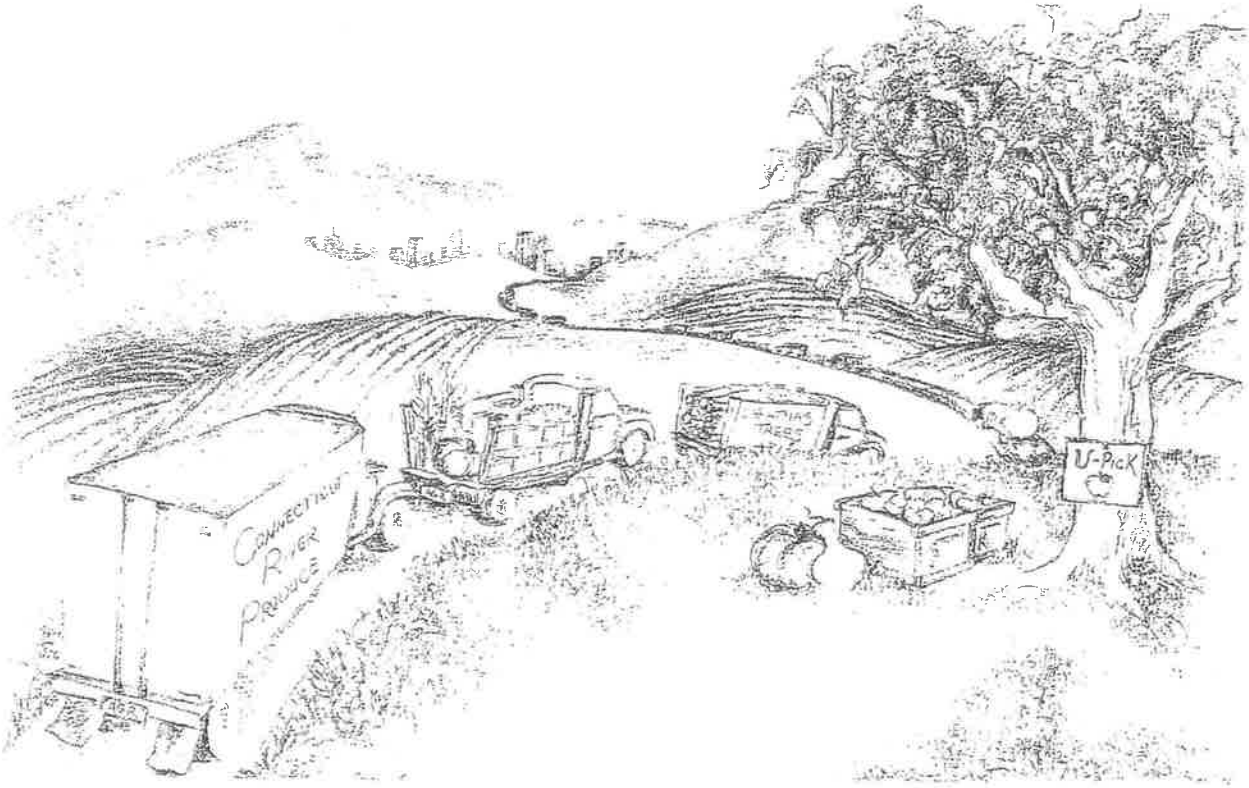
Claremont, NH: Agricultural use of the shoreland predominates along about two-thirds of the riverfront in Claremont. On the Upham Estate there is a stand of old growth pine. This near-virgin stand is carefully maintained by the caretakers of the estate.

Springfield, VT: Cornfields, hayfields, and sparse residential development are predominant from the Route 91 exit to the Rockingham town line. North of the exit, land use is mixed agricultural and residential. There is a major Christmas tree farm approximately 3 miles north of the toll bridge. Public open space includes the Springfield Town Forest.

Charlestown, NH: The majority of the land along the river is presently either NEP farmland or in other private ownership and is currently farmed.
Rockingham, VT: Open space that is available for public use includes the Bellows Falls municipal forest, Upper Meadows owned by NEP, Dorand State Forest, and woodland on Randall Hill Road owned by the Connecticut River Watershed Council. Private open space includes former Steamtown USA land, NEP's agricultural land at the Rockingham/Springfield town line, and woodland on Coburn Hill.

Conditions needed to sustain local agriculture

- good agricultural soils free from development; farmland which remains open and active also brings in tourism, supporting the local economy and helping to keep agriculture viable
- flexible zoning which uses clustering and other tools to keep agricultural land open, without restricting development
- Sullivan County Growers Association in NH - a growers' group organized through the Cooperative Extension Service that promotes agriculture in the county
- adequate infrastructure of agricultural suppliers, distributors, veterinary services
- a critical number of farms to maintain supporting infrastructure
- consumer recognition of the costs of food production and desire to support local agriculture
- consumer demand for locally grown produce, dairy products, syrup, beef, etc.
- adequate and fair prices for farm products
- participation by land trusts in protection of agricultural lands
- current use assessment program
- assistance from Natural Resources Conservation Service, Farm Services Agency, state departments of agriculture, and Cooperative Extension Services of the Universities of Vermont and New Hampshire
- mutual understanding between farmers and the non-farming public about the needs of agriculture



Potential areas for expansion

- expanded markets for local agricultural products
- grower cooperatives (as in Ocean Spray)
- more diversified agriculture: more maple sugar production, more value-added dairy products, increased local production of beef and lamb
- chain supermarkets accept more local products (especially apples and dairy products)
- farmers' market which focuses upon farm products rather than baked goods or crafts
- more utilization of manure as a cash crop
- horse-drawn sleigh and wagon rides for the large tourist industry, which in turn could support another market for hay, a crop less demanding upon water and soil than corn
- production of specialty foods at commercial cooks' kitchen
- locally bottled water
- hobby farming as a means of keeping land open and maintaining demand for infrastructure and support services
- application of biosolids where beneficial as part of a total nutrient management plan, applied using best management practices and following federal, state, and local regulations
- composting of biosolids, leaves, and other organic waste
- more consistent use of best management practices

Conditions needed to make these possible

- increased funding for marketing programs, particularly for NH Department of Agriculture
- education for those interested in becoming hobby farmers
- development of nutrient management plans for farms to avoid unnecessary application of fertilizer and/or biosolids
- adequate enforcement of biosolid application regulations

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CURRENT PROBLEMS

Loss of farm and forest land

- loss and fragmentation of productive land by industrial and residential development
- bank erosion

Conflicts with newer uses

- lack of support, understanding and tolerance by non-farming public for common farming practices such as manure spreading, tractor noise, thinning and clearing of land
- traffic conflicts with agricultural vehicles
- Cooperative Extension Service is currently underfunded; agricultural agents are unable to pay regular visits to area farms because they are inundated with homeowner inquiries

Costs

- inadequate prices for farm products, especially dairy
- high capital cost of setting up a farming operation
- current use assessment may not be equitably administered from one town to the next
- regulations imposed on farmers as a result of isolated incidents that result in increased costs and time to the farmer, cutting into already slim profits
- increasing insurance costs for farmers offering hay and sleighrides has recently discouraged many from continuing this business
- high cost of compliance with many environmental regulations and best management practices
- Farm Services Agency cost-sharing assistance for manure pit construction or other

nonpoint pollution abatement projects is not available to farmers who have owned their operations less than 5 years, or to those who have recently made other major improvements; this discourages new farmers and discourages other improvements

Potential problem areas

- limitation of irrigation by instream flow rules at a season when irrigation will be most urgently needed; regulations and advised practices for New Hampshire side of river are not mirrored on Vermont side, such as registration of water withdrawals for irrigation
- further reduction in funding of local, state, and federal assistance/support programs for farmers
- more regulations from pressures originating outside of agriculture
- increase in development pressure upon the land once the economy improves
- nutrient lockup resulting from overapplication of high-pH stabilized biosolids

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OBJECTIVE

Because of the high quality of riverbottom soils for farming, the microclimate along the river, and the number of farms located along the river, the objective of this plan is to support and ensure the continuation of existing farms and forests and to encourage growth in agriculture and forestry within the river corridor, while minimizing any negative impact of agricultural and silvicultural activities upon the river.

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RECOMMENDATIONS

FEDERAL GOVERNMENT

USDA *should:*

- improve funding for Cooperative Extension Service and Conservation Districts to assist farmers in developing nutrient management plans; educate and assist farmers with best management practices and estate planning
- encourage small part-time farming as a viable form of agriculture; utilize financial programs, markets, and educational tools

Farm Services Agency *should*:

- extend grants to any farmer interested in making improvements related to non-point pollution abatement, not just those who have been on the farm for at least 5 years and those who have not recently undertaken major improvements.
- adopt consistent, simple terms for cost-sharing programs

STATE GOVERNMENT

Legislatures *should:*

- ensure uniform administration of current use program among towns; Vermont strengthen its current use assessment program
- examine tax policies to be sure they encourage agricultural use of land
- propose measures to reduce the impact of insurance costs on agriculture and silviculture

Departments of agriculture *should*:

- increase use of best management practices for agriculture and forestry, and provide information on sources of funding to help carry them out
- offer financial incentives for improvements and adopt consistent, simple terms for cost-sharing programs
- discourage logging on steep slopes near the river
- NH develop best management practices for agricultural irrigation

- NH expand its marketing program
- ensure that hydro dams release enough water during droughts to support agricultural uses
- increase cooperation between VT and NH in the area of agriculture
- educate the public about the value of locally-produced foodstuff
- encourage small part-time farming as a viable form of agriculture; utilize financial programs, markets, and educational tools
- educate the public and current and would-be local farmers about the concept of community-supported agriculture ("CSAs")
- keep agricultural infrastructure strong (seed and equipment dealers; auction houses; slaughterhouses)
- increase awareness of farm tourism opportunities; put farms in direct contact with tourism boards and tour companies
- investigate and stimulate grower cooperatives such as those in Washington State among apple growers, and Ocean Spray in New England
- educate landowners about biosolid application

TOWNS *should:*

- examine their tax policies to be sure they encourage agricultural use of land; note that agricultural land costs towns far less than residentially developed land in terms of services such as education, road maintenance, and fire and police protection
- work with regional planning commissions to map and protect soils of agricultural significance; undertake LESA (Land Evaluation and Site Assessment) and incorporate in their master plans
- encourage cluster zoning to protect agricultural land
- encourage recycling of sites already developed for industrial use, to relieve pressure on agricultural lands

PRIVATE SECTOR

Farm and forestland owners *should:*

- employ best management practices
- avoid logging on steep slopes near the river and storing manure too close to the river
- work with conservation districts and Cooperative Extension Service to prepare total nutrient management plan for their land, to make best use of available nutrients, reduce potential for water quality impacts, save farm money by reducing cost of fertilizer purchases, and determine where and when biosolid application could benefit the farm operation

Conservation organizations *should:*

- continue to assist in protecting agricultural and forest land along the Connecticut River

Connecticut River Joint Commissions *should:*

- facilitate agreement with Vermont water users in conjunction with instream flow rules and New Hampshire water user registration

Business community *should:*

- establish a regional wholesale/retail farmer's market to help make people aware of the kinds of commodities which can be produced well in this region
- keep agricultural infrastructure strong (seed and equipment dealers; auction houses; slaughterhouses)
- provide education to real estate customers about farming practices and being good neighbors to farms

The public *should:*

- support Family Forest Lands legislation
- support small local dairy processing plant in Plainfield and other local agricultural producers

REFERENCES

Connecticut River Valley: Opening New Markets for Agriculture, Conference Proceedings and Recommendations, 1994. This report reviews a valley-wide conference sponsored by the CRJC, and presents dozens of recommendations dealing with financing, market regulations, government support, processing and distribution, agri-tourism, cooperatives and contract marketing, and community supported agriculture. Farmland trends taken from supporting research papers are also summarized.

Findings to Support Classification of Segments of the Connecticut River, Connecticut River Valley Resource Commission, 1991. These findings, prepared with the help of citizens along the length of the river, nominated 34 specific segments of the river in several categories for classification and instream protection through the New Hampshire Rivers Management and Protection Program.

MAPS

Ascutney River Subcommittee Connecticut River Corridor Land Use, Upper Valley/Lake Sunapee Regional Planning Commission, 1996. GIS map prepared for the Mt. Ascutney LRS with the support of NH DES, showing residential/commercial land use, croplands/pasture, forested land, farmsteads, gravel pits/utilities, and conservation lands in the area between Route 12A and the Connecticut River. Individual maps cover Plainfield, Cornish, Claremont, and Charlestown, NH. Scale 1:15,000 or 1:18,000

Highlights of the New Hampshire Natural Resource Protection Project, New England Interstate Water Pollution Control Commission and the Environmental Protection Agency, 1996. GIS map prepared for the Mt. Ascutney LRS shows agricultural lands, unfragmented natural lands and shorelines, high value freshwater wetlands, drinking water supplies and pollution threats, bald eagle wintering sites, conservation and public lands, and some natural heritage inventory sites. Copies of the map have been provided to NH riverfront towns through the subcommittee.

Connecticut River Resource Protection Project, GIS maps produced by Windham Regional Commission with support by the CRJC Partnership Program, 1997. Map produced for Rockingham and other riverfront towns in Windham County.
Protected Lands. Map includes Act 250 restrictions, and lands protected by conservation easement, fee ownership, and management agreements. Surface waters and major roads are included.
Current Use Lands. Map shows lands enrolled in the current use program for agriculture and for forestry, in addition to surface waters and major roads.

HISTORICAL & ARCHEOLOGICAL FEATURES

HISTORY ALONG THE RIVER

The industrial and agricultural heritage of the Mt. Ascutney region is in many ways a gift of the Connecticut River and its tributaries: their floods delivered rich soils, and their power delivered energy to run the small sawmills and the large precision manufacturing industries that followed. Historic agricultural landscapes and building complexes throughout the region still define its rural character, supported by reknowned covered bridges and the stone walls and maple-lined dirt roads. The entire river corridor contains densely clustered archeological resources, evidence of earlier human occupation along the rich bottomlands of the Connecticut River.

Village clusters still retain their nineteenth century flavor, and at Claremont, Springfield, and Windsor, commercial and cultural buildings spanning 200 years represent long-vibrant urban centers. Significant architectural resources exist on Routes 12A in New Hampshire and Route 5 in Vermont. Exemplary Federal and Greek Revival buildings are common, and later architectural styles are also well represented. Many buildings on Route 5 from Hartland to Rockingham are listed in the Vermont State Historic Sites Survey. Many districts and individual sites in the corridor are listed on or eligible for listing on the National Register.

Historic sites draw thousands of visitors to the region each year, benefitting both the attractions themselves and the lodging, restaurant, and other service industries in the area. Area historical societies, Historic Windsor, American Precision Museum, Vermont Division for Historic Preservation Historic Sites Program, Rockingham Certified Local Government, Fort No. 4, and the Plainfield Historical Society are particularly active. Heritage Tourism guidebooks are available for Hartland, Windsor, and Rockingham to help visitors understand historic resources.

The following is a sample of some of the many historic and prehistoric sites in Mt. Ascutney region towns:

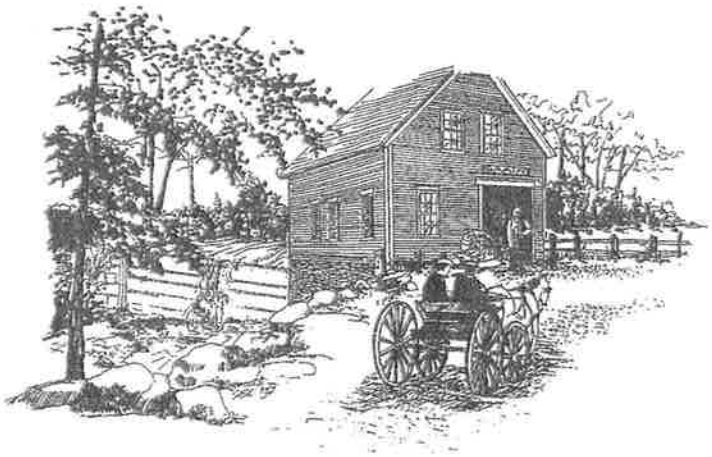
Hartland, VT: National Register Historic District. A canal was constructed 1810-12 at Sumner Falls to facilitate movement of logs to downriver sawmills and open navigation from Long Island Sound. A railroad bridge built in 1848 brought the railroad to Vermont from Lebanon, NH, and created the village of White River Junction. Construction of five railroads between 1848 and 1863 established White River Junction as one of the region's major transportation centers. The National Register Historic District contains commercial buildings associated with its role as a rail center.

Plainfield, NH: Plainfield's 1846 Greek Revival style Town Hall contains a Maxfield Parrish stage set currently under restoration. Parrish, an artist, inventor, and machinist, kept a studio here from 1898-1966. Many Cornish Art Colony homes remain. Plainfield Village is a National Register District.

Windsor, VT: Three National Register Districts along Route 5. The Vermont Constitution, the first in the nation to prohibit slavery, to authorize a public school system, and to establish universal voting rights for all males, was signed at Elijah West's tavern in 1777 (the Old Constitution House). The Cornish-Windsor Covered Bridge provides an important link to New Hampshire along with a sense of pride about the

historic importance of the bridge. Built in 1866, it is the longest wooden bridge in the U.S. (460') and the longest two-span covered bridge in the world. The fourth bridge on this site, it employs a patented lattice truss design. The American Precision Museum, a National Historic Landmark, is located in the former 1846 Robbins and Lawrence Armory and Machine Shop next to Mill Brook. The Ascutney Mill Dam is the first masonry gravity-arch dam built in the U.S., and is on the National Register. The 1798 Old South Church was designed by Asher Benjamin, whose books exerted a profound influence over design of early river valley churches. The Vermont State Craft Center is located in the Windsor House, a restored c. 1830 Greek Revival-style hotel.

Cornish, NH: Cornish history was greatly influenced by the river and its stands of timber. Very early, the British established a mast camp close to the mouth of Mill Creek a short distance south of the Cornish-Windsor Covered Bridge. The first Cornish colonists established themselves abut two miles north of this camp in the general vicinity of the point where Blow-Me-Down Brook enters the river, and where, in later years a mill pond and mill were established. In those days, the river offered the only access to the area. Trinity Church and the 1790 house of Salmon P. Chase, a chief justice of the U.S. Supreme Court who helped found the Republican Party, are historical buildings from a later era along the river. There are four covered bridges in town, although not all are located within the corridor. Of the many Cornish Art Colony homes which retain historic significance, Saint-Gaudens National Historic Site, home of internationally recognized sculptor Augustus Saint-Gaudens, is the best known.



Weathersfield, VT: The town features an abundance of Federal and Greek Revival buildings on Route 5, and the Weathersfield Center Church, which was rebuilt after a fire. At the Ashley Ferry site, a ferry crossed from the Weathersfield Bow to Claremont. William Jarvis revolutionized American sheep farming in 1811 when he imported some 500 Merino sheep from Spain. The large brick residences in many rural places in the region, including the National Register district of Weathersfield Bow, were built by sheep farmers who profited during the resulting Merino sheep boom.

Claremont, NH: The original ferry from Claremont to Vermont was established in 1784 near the current boat landing. Ferry rights are still held by a local family. Claremont was the terminus of the second New Hampshire turnpike in 1799 from Amherst, NH. The first wood frame house in town was built in the Town House Hill area and later moved across the Sugar River to its current location where it is known as the Tyler House. The Cupola House on Route 12A north of 11-103 is where the Masonic Order was chartered in 1797. It was also used as a tavern at one time. Hubbard and Jarvis Islands were used for sheep pasture in the 1700's and 1800's. Significant Federal period architecture remains on Route 12A and Barber's Mountain. The Monadnock Mills cotton mill on the Sugar River was the first (1830s) and soon the largest textile manufacturer in the upper Connecticut River Valley and transformed a rural village into an urban industrial town. Archeological resources include the Hunter site, where deposits scattered through eleven vertical feet of soil suggest some 4,000 years of occupation.

Springfield, VT: At the Skitchewaug archeological site, stored maize, beans, and squash were found associated wtih a radiocarbon date of AD 1120, indicating farming in a settlement. The site may have been occupied for 2000 years before that time. The first machine shop was built in Springfield about 1810 and the machine tool industry shaped the town's growth in the late 19th and early 20th centuries, seen today in a National Register District. The Hartness Airport is Vermont's first airport, built in 1919 by James Hartness, a governor of Vermont. Stellafane Observatory (1924-30, National Historic Landmark), was the home of the national's first organized group of amateur telescope makers. The 1937 toll bridge to Charlestown, a steel petit truss bridge, is listed on the National Register.

Charlestown, NH: Charlestown is the site of Fort #4, the most northerly outpost of European civilization during the French and Indian War, originally built in 1744. The fort has been rebuilt and is now offers the only living history museum in New England preserving and interpreting the mid-1740s and 1750s heritage of the Upper Connecticut River Valley. Charlestown's Main Street National Historic District includes 68 historic buildings. The Crown Point Military Road, the first in the region, was built during the French and Indian Wars in 1759-60 and linked Fort No. 4 to Springfield, Weathersfield, and Lake Champlain, employing a ferry across the river. Two Gothic Revival style churches built across the river from one another by architect Richard Upjohn in 1863 are St. Luke's Episcopal Church in Charlestown and Immanuel Episcopal Church in Rockingham.

Rockingham, VT: The Great Falls at Rockingham have attracted human activity for centuries. A set of petroglyphs of ornamented heads, considered to date from the Contact Period, are carved into rock outcroppings near the Great Falls where Native Americans gathered during the fish migration to harvest shad and Atlantic salmon. Other petroglyphs, unaltered by modern chiseling and paint, are believed buried nearby under 19th century stone rubble. The nation's first canal company charter was granted for a canal at the village of Bellows Falls, built 1792-1802, the third canal built in the U.S. The work included a dam and eight locks to move goods up 54 feet over Great Falls. An early bridge over the Connecticut River was built at Bellows Falls before 1792. The concrete arch, open spandrel Vilas Bridge spanning the gorge between Rockingham and Walpole, built in 1930, is considered of national significance, a rare bridge in its original condition with outstanding architectural and engineering details. The bridge stands on the site of the very first bridge on the entire length of the Connecticut River, a covered bridge built in 1785. The c. 1831 Adams Grist mill drew water from the adjacent 1802 canal and operated until 1961; it is now a museum.

Bellows Falls developed as a transportation, manufacturing, and commercial center after an east-west rail line was brought from New Hampshire in 1849 and connected to a north-south line along the river in 1851. In response to restrictive topography, a distinctive 275' long railroad tunnel was constructed that year through solid rock, beneath the village's central square. The river once transported logs to the first paper mill to successfully manufacture paper from wood pulp, established at Bellows Falls in 1869. Later the International Paper Company, it made Bellows Falls one of the world's leading paper manufacturers and owned saw, pulp, and paper mills throughout the Connecticut River Valley.

Making the most of history in the future

- tourists in the region could be attracted by and better appreciate the Mt. Ascutney region's history and pre-history, bringing dollars into the area by respectful visitors ("heritage tourism")
- cross-river cooperative connections could be developed between historical areas such as Bellows Falls VT/ Charlestown NH and Windsor VT /Cornish NH

- a Precision Valley Heritage Corridor could encompass towns which contributed to the history of precision manufacturing and the machine tool industry, such as Springfield and Windsor, VT and Claremont, NH

Conditions needed to make these possible

- recognition and appreciation of historic values by local residents and property owners
- economically viable agriculture to preserve agricultural landscapes and buildings
- zoning which allows adaptive reuse of historic buildings, particularly in village clusters, and cluster development, to preserve agricultural landscapes
- careful education and promotion of the rural historic values of the region
- respect of private property rights by visitors and residents alike
- heritage tourism industry allows bed and breakfast operations in historic houses to remain economically viable
- volunteer support from the region and financial support from local donors for historical society activities and architectural rehabilitation
- development of heritage tourism itineraries
- inventory of historic and cultural resources in preparation for the Connecticut River Joint Commissions could form the basis for regional heritage tours and local historic preservation activities

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CURRENT PROBLEMS

- decay of historic structures
- inflexible building code requirements which may not be attainable without loss of historic value
- bank erosion exposes archeological sites
- archeological programs need staffing and financial support
- historical societies, sites, museums, are underfunded

Potential problems

- commercialization and loss of historic character in both rural and community sections in response to tourism
- trespassing by curious tourists on private property
- loss of historic agricultural landscapes to industrial/commercial/residential development
- loss of identity of historic village clusters
- deterioration of historic bridges if they are taken out of service without provision of maintenance funds
- looting of archeological sites

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OBJECTIVES

The Mt. Ascutney River Subcommittee wishes to see the rich and varied cultural and natural heritage of its region remain evident for the enjoyment and education of both residents and visitors. Preserve and use historic structures without destroying their historic fabric and character. Support continued economic development through increased heritage tourism.

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RECOMMENDATIONS

FEDERAL GOVERNMENT

National Park Service *should:*

- provide tax incentives and recognition for historic rehabilitation work
- support state historic preservation and tourism offices
- continue to preserve and protect the Saint-Gaudens National Historic Site including the cultural and natural resources of the site. NPS should respond to the articulated concerns of Cornish residents. The Park Service should not use eminent domain to acquire property, and should not degrade the rural character of this area or the integrity of the riverbank.

STATE GOVERNMENT

Offices of historic resources *should:*

- expand opportunities for archeological investigations; consider establishing archeology programs at state universities

Transportation agencies *should:*

- work with state historic preservation offices to establish fund for maintenance of historic bridges and protect stone walls
- consider the size and design of signage

Tourism offices *should*:

- cooperate better between the states for tourism in the river valley

TOWNS *should:*

- protect stone walls
- consider the size and design of signage
- avoid commercialization and loss of historic character
- consider allowing specific multiple uses in existing structures in their village districts to allow more economically feasible use

PRIVATE SECTOR

Regional Planning Commissions *should:*

- assemble information on sites and features of significance in each town, in conjunction with the Tri-State Scenic Byway Study, and provide this information to local historical societies and town officials

Citizens *should:*

- support local historical societies, sites, museums, and preservation organizations of historic buildings and retain the vitality of these centers
- skidder operators and others working in the woods and fields should take care to limit crossing stone walls to a single location if they must be crossed at all
- owners of historic agricultural landscapes work with Upper Valley Land Trust to conserve these landscapes

Historical societies *should:*

- educate their fellow citizens about local history and how it relates to the Connecticut River; consider writing histories of their town, publishing walking tour guides, and conducting oral history interviews
- participate in the Tri-State Scenic Byway Study to be certain that it is responsive to their town's interests and concerns and provides their towns with the information they will find most useful; work with regional planning commissions
- participate in translating the CRJC cultural heritage resources inventory into educational material that will be useful to their towns, citizens, and heritage tourism-oriented businesses

Business community *should:*

- educate visitors in visitor etiquette
- establish a Precision Valley Heritage Corridor which would encompass towns which

contributed to the history of precision manufacturing and the machine tool industry. (Springfield, Windsor, VT and Claremont, NH)

- develop multi-community cooperative approach to developing heritage tourism, such as between Bellows Falls, VT and Charlestown,NH
- support Vermont Film Council

◆

REFERENCES

Cultural Landscape of the Connecticut River in New Hampshire and Vermont, Richard Ewald, draft report 1995, Connecticut River Joint Commissions, final report in publ. An illustrated report to the National Park Service from the CRJC, covering pre-history and early settlement, transportation, agriculture, industry, conservation, culture and government, architecture and settlement patterns, and tourism and recreation. Includes maps identifying selected sites in each subject.

Connecticut River Historic Sites Database, in preparation by Inherit New Hampshire for the CRJC. Computerized database of some 2800 historic sites in 27 riverfront communities, including all of the Mt. Ascutney region towns.

Findings to Support Classification of Segments of the Connecticut River, Connecticut River Valley Resource Commission, 1991. These findings, prepared with the help of citizens along the length of the river, nominated 34 specific segments of the river in several categories for classification and instream protection through the New Hampshire Rivers Management and Protection Program.

FUTURE LAND USE

ALONG THE RIVER TODAY

The Mt. Ascutney region embraces a wide diversity of land uses. A hydroelectric plant transforms the river's energy a short paddle away from a stretch of fish and wildlife habitat that has drawn national attention. Business goes on in healthy urban centers just upstream from favorite fishing waters and farmlands. Vibrant modern communities share the riverfront with prehistoric sites and colonial villages. The majority of the roads paralleling the river offer abundant scenic views which are a major tourist attraction and make the Mt. Ascutney Region a desirable place to live. This outstanding scenic quality is due in no small part to the presence of Mount Ascutney, a monadnock rising upward to 3150' from the Vermont shore.

Land use in the corridor is not limited to human use. Floodplains are essential for floodwater storage and also provide critical habitat for both common and rare species of plants and animals.

It is important to understand that some uses of these resources are in conflict. For example, while prime agricultural soils are a key resource for farming, these soils are also useful for residential development due to their ability to support septic systems.

The following description of local land use and scenic resources is based upon the Connecticut River nomination for the New Hampshire Rivers Management and Protection Program:

Hartland, VT: The major land uses in the river corridor: agriculture, gravel extraction, industrial, residential, the Central Vermont Railroad, and some steep forested banks. "Proposed Density Areas" from the 1988 Municipal Plan show that of the 7.5 miles of Connecticut River frontage in Hartland, about 60 percent is proposed medium density (overall housing density of 1 dwelling per 5 acres), 37 percent is proposed industrial, and 3 percent is proposed high density (overall housing density of 1 acre per house).

The major scenic vista along the river corridor in Hartland is the view down the Valley to Mount Ascutney. This is a prevalent and spectacular view all along Routes 91 and 5 and from the river.

Plainfield, NH: Riverfront land use is entirely agricultural or low density residential.

From a canoe, the entire river segment looking towards Plainfield is scenic with views of corn fields, woods, and steeply rising hills above. The view towards Vermont is much the same except along the extensive gravel pits in Hartland. In several locations, the river is framed by steep hills on both sides and Mount Ascutney rises in the background creating a striking scene.

Windsor, VT: Route 5 parallels the Connecticut River through Windsor. In the extreme northern and southern sections of town the land use is agricultural. The remaining land use in Windsor is a mixture of high density residential, commercial, and industrial.

Scenic views include the view of the Windsor Country Club from Route 5, the view from Route 91 at the Windsor-Hartland town line, and the view of the river from the Blue Ridge Riding Stable.

Cornish, NH: The Connecticut River closely parallels Route 12A along the west side of Cornish. The river corridor is relatively undeveloped between Route 12A and the river, being essentially low density residential, forested, and agricultural, with minor sand/gravel quarry operations in the northern sector. A major feature in this area is the Cornish-Windsor Covered Bridge. A railroad line south of the covered bridge further limits the development potential of the area south to the Cornish/Claremont town line.

The whole stretch of the Connecticut River in Cornish is scenic, as viewed both from the river and from the land. The scenic quality is enhanced by the proximity of

Route 12A to the river, assuring continuous views of the river valley if not of the river itself, across the intervening fields, pasture, and woodland. Some scenic focal points in Cornish: Mount Ascutney; Cornish-Windsor Covered Bridge; old growth pines at Saint Gaudens (from Blow-Me-Down Brook); old railroad bridge; view of the Beaman Estate north from the covered bridge; the continuous river terrace as a flat ribbon between the river proper and the steep valley wall abutting on the east.

Weathersfield, VT: North of the village of Ascutney, there is commercial development along Route 5. Although land along the river there is zoned industrial, it is mostly open space at present. The village residential area extends to just south of the Route 131 bridge to Claremont. From the Weathersfield Bow to the Springfield town line, riverfront land use is agricultural. There is an overhead utility crossing just south of the Route 131 bridge.

Mount Ascutney dominates views in Weathersfield. There are spectacular views from many points on the river as well as other spots in town looking towards the mountain. The views towards the river valley from the mountain are significant. South of Weathersfield Bow, the views of farmland and open space from the river are inspiring.

Claremont, NH: The river corridor in Claremont north of Routes 11 and 103 is predominantly agricultural and forested with some residential use. The southern part of town is zoned industrial with everything including heavy industry permitted. Significant industrial development has taken place on the terrace above the river, leaving the riverfront forested and agricultural.

There are scenic vistas from the river, Ascutney Bridge, and Route 12A. Farmlands are a prominent part of the scenery above the bridge with estates on the hill below Routes 11-103, and prominent historic homes with beautiful views of Mount Ascutney.

Springfield, VT: Along the Connecticut River corridor in Springfield, there is farmland and low density residential use from the town boundary with Rockingham north to the interstate exchange. North of the interchange, there are alternating stretches of farmland and steep forested banks.

Springfield's entire river corridor provides one long scenic drive on Route 5 due to its rural character, low density housing, and closeness of the road to the river. The Skitchewaug Trail is particularly spectacular.

Charlestown, NH: There is some residential use south of the toll bridge, however, most land along the river is agricultural. In N. Charlestown there is one industrial site.

The watch tower of Fort No.4 and the lower boat landing offer spectacular views north and south along the Connecticut River, including the great meadows and green hills of Vermont. Route 12 south of town offers fine views of the river and adjacent setbacks.

Rockingham, VT: Between the boundary with Springfield and the Williams River, land use is agricultural or rural which is defined as low to moderate intensity residential use. South of the Williams River the land use is industrial. With the exception of the former "Steamtown" area which is at a lower elevation, the industrial areas are on a terrace above the river. At the southeast corner of the town, the village of Bellows Falls is designated as the only urban area within the town. The village includes intensively developed areas near the river and is served by village sewer and water systems.

The Rockingham Town Plan specifically identifies scenic resources within the town, and eight of these sites are along the Connecticut River. They include the following: view north of Connecticut River and Mount Ascutney from Rockingham Street, Bellows Falls; view north of the Connecticut River and Valley from the Griswold Heights area, Bellows Falls; view south of the Connecticut River and Valley and Bellows Falls in the distance from Route 91 rest area near the Rockingham/Springfield town line. Also the so-called "setback" area just north of Bellows Falls village (below the Joy Wah restaurant); Herrick's Cove area; Roundy's Cove area; Albee's Cove area; view of Connecticut River from plateau located north of Williams River and east of Route 91.

Conditions needed to sustain scenic values

- clean water...surface waters need protection from pollution
- stable banks are needed to protect water quality as well as property in close proximity to the river
- visual screening is needed to conceal development or unsightly areas form the river, and to provide privacy for landowners
- local land use regulations need provisions that address buffers and scenic assets
- enforcement of existing regulations on gravel pit closure and reclamation, logging, and erosion control

Potential land uses to be encouraged

These land uses deserve special encouragement for their benefits for flood control, water quality protection, fisheries, agriculture, wildlife, recreation, tourism, and scenic beauty:

- open floodplains available for flood storage and open space
- agricultural land and wildlife habitat, protected from development
- restored buffers of vegetation along the river
- opportunities for outdoor recreation and cultural and natural heritage tourism

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CURRENT PROBLEMS

- serious riverbank erosion threatens Route 12A
- portions of roads are located too close to the river
- riprap along riverbanks can be unsightly and detrimental to downstream land uses
- unreclaimed gravel pits can also be problem areas
- dredging and filling impact habitat
- noise pollution from Interstate 91
- trailer park in south Charlestown is vulnerable to flood damage
- structures in the floodplain can reduce its water storage capacity diverting floodwater downstream
- contaminated run-off from impervious surface or the overuse of fertilizers and pesticides can affect water quality
- some shoreline in Windsor is an eyesore due to illegal dumping of trash
- dumping of salt-laden snow in the river continues in some places

Potential problem areas

- bank erosion threatens roads and other structures built too close to the river
- landfills sited too close to the river could lead to leaching of contaminated groundwater and blowing trash in the river
- contamination by septic systems located too close to the river
- development can destroy scenic views
- lighting from development can be disturbing
- development close to the river threatens water quality

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OBJECTIVES

Minimal land disturbance activity, other than agriculture, should take place in the floodplain and in flowage areas in order to protect investments, given the potential for riverbank erosion and channel movement. Towns should encourage a balance of uses in the river corridor while recognizing that its long-term economic value, for tourism, agriculture, recreation and development, depends upon retaining the present rural condition, and recognizing the need to provide housing and employment for the people who live in riverfront towns, which will not detract from the existing condition and the unique role of the river corridor.

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NEW HAMPSHIRE RIVERS MANAGEMENT & PROTECTION ACT

RSA 483 provides general guidance for future land use in the New Hampshire corridor of the Connecticut River. Please refer to the map on page 6 and outline of the law's provisions in Appendix A. While the majority of the Mt. Ascutney segment is designated as rural, there are also rural-community and community sections that have included both commercial/industrial centers for almost 200 years.

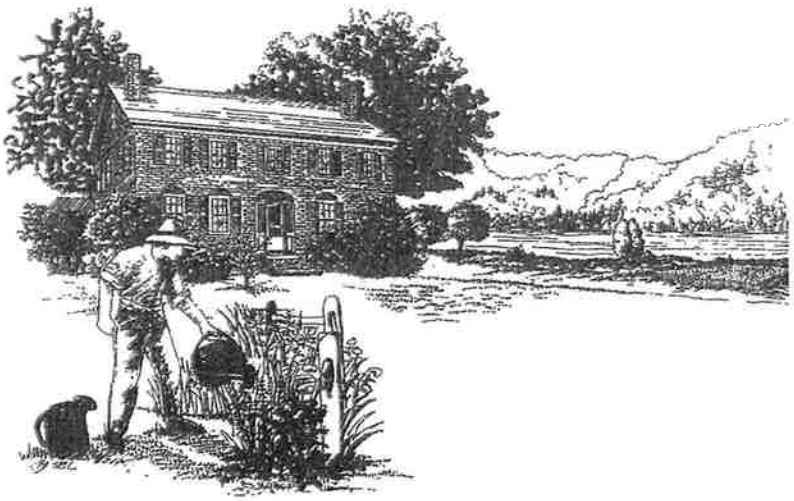
Rural river segments

The law defines these waters as "adjacent to lands which are partially or predominantly used for agriculture, forest management and dispersed or clustered residential development. Management of rural river... segments shall maintain and enhance the natural, scenic, and recreational values of the river for agricultural, forest management, public water supply, and other purposes which are compatible with the instream public uses of the river and the management and protection of the resources for which the...segment is designated."

In the Mt. Ascutney Region, two extensive segments of the Connecticut River are designated as rural:

- from the Lebanon-Plainfield town line to the Blow-Me-Down Brook in Cornish
- from the north end of Chase Island to the south side of the Williams River in Bellows Falls

Local zoning in Plainfield, Cornish, Claremont, and Charlestown, NH should honor the stipulations of this designation. Hartland, Windsor, Weathersfield, Springfield, and Rockingham, VT should also consider these provisions.



Rural-community segments

These river segments "flow through developed or populated areas...and which possess existing or potential community resource values such as those defined in official municipal plans or land use controls. Such rivers have mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. Such rivers have mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial, and industrial land uses.

Such rivers are readily accessible by road or railroad and may include impoundments or diversions."

"Management of rural-community...segments shall maintain and enhance the natural, scenic, recreational and community values of the river and shall consider, protect, and ensure the rights of riparian owners to use the river for such uses as agricultural, forest management, public water supply, residential, recreational, commercial, industrial, flood control, and other community uses which are compatible with the instream public uses of the river and the management and protection of the resources for which the...segment is designated."

In the Mt. Ascutney Region, one segment of the Connecticut River is designated as rural-community:

- from the Blow-Me-Down Brook in Cornish to the northern end of Chase Island. This segment received this designation because of the location of the community of Windsor on the Vermont side of the river.

Local zoning in Cornish, NH should honor the stipulations of this designation. Windsor, VT should also consider these provisions.

Community segments

Community river segments "flow through developed or populated areas...and possess existing or potential community resource values, such as those identified in official municipal plans or land use controls. Such rivers have mixed land uses in the corridor reflecting some combination of open space, agricultural, residential, commercial and industrial land uses. Such rivers are readily accessible by road or railroad, and may include existing impoundments or diversions, or potential sites for new impoundments or diversions for hydropower, flood control or water supply purposes, and may include the urban centers of municipalities."

"Management of community...segments shall maintain and enhance the natural, scenic, recreational and community values of the river and shall consider, protect, and ensure the rights of riparian owners to use the river for such uses as agricultural, forest management, public water supply, residential, recreational, commercial, industrial, flood control and hydroelectric energy production purposes which are compatible with the instream public uses of the river and the management and protection of the resources for which the...segment is designated."

One segment of the Connecticut River in the Mt. Ascutney Region is designated as community:

- from the southern side of the Williams River in Bellows Falls to the Saxtons River in Westminster, VT

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In addition to this general guidance of the Rivers Act, repeated here for consideration by towns on both sides of the river, the Mt. Ascutney Subcommittee offers the following specific recommendations. Current town regulations regarding the river are presented in Appendix C, and a variety of regulatory and non-regulatory tools for protecting riverfront lands and water quality are presented in Appendix D.

STATE GOVERNMENT

Departments of transportation *should:*

- minimize investments in structures such as roads within the floodplain and flowage rights

Water quality agencies *should:*

- State of Vermont adopt setbacks for landfills to match New Hampshire's

TOWNS *should:*

...given the ability and nature of the river to move within its floodplain and erode its banks:

- discourage building in the floodplain
- discourage any public or municipal investment in the floodplain
- advise landowners (through town conservation commissions) on establishment and maintenance of riverside buffers, including tree cutting

...to maintain water quality and sustain the valuable scenic quality of the riverfront:

- adopt the NH Comprehensive Shoreland Protection Act as minimum protection for the river corridor and consider adopting stronger regulations for development here such as greater setbacks, minimum lot sizes, minimum frontage requirements, height restrictions on building, and clustering development
- adhere to provisions of New Hampshire Rivers Management and Protection Act with respect to dredging, filling, gravel mining, and channel alteration
- discourage development from affecting the scenic view from the river
- encourage commercial development in existing locations in downtown areas
- discourage the loss or conversion of any farm, woodland or open land
- carefully consider any irreversible, detrimental use of the corridor's natural and scenic features, and discourage continuation of any uses which are detrimental to the river
- take action to control riverbank dumping where it is a problem

...to protect water quality:

- consider creating a wetlands overlay district in the corridor for flood control
- prohibit auto junkyards, hazardous materials storage facilities or salt sheds within 250 feet of the river
- discourage the siting of uses which would require the transportation of hazardous materials in the corridor
- adopt sediment and erosion control guidelines
- encourage reclamation of gravel pits into uses which are conducive to plan objectives

PRIVATE SECTOR

Landowners *should:*

- maintain naturally vegetated riverside buffers for privacy, protection of water quality, wildlife habitat, and erosion control; a healthy, well-distributed stand of trees should be maintained for at least 150'
- use caution when applying fertilizer; avoid using phosphate, fertilizers, or detergents where they could leach into the river
- set back leaching portions of new septic systems; consider soil characteristics
- minimize investment in the floodplain
- carefully consider any irreversible, detrimental use of the corridor's natural and scenic features
- keep trash and refuse out of the river

RECOMMENDATIONS

REFERENCES

Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials, NH Dept. of Environmental Services, 1994. This useful reference explains nonpoint source pollution and concisely covers the best management practices, current laws and regulations, and reasons for concern for the top ten land use activities which can cause pollution. Individual actions are highlighted, as well as current watershed protection and planning.

Native Vegetation for Lakeshores, Streamsides, and Wetland Buffers, VT Dept. of Environmental Conservation, 1994. This guide describes buffer strips and contains general considerations, native plant descriptions and maps of hardiness zones in VT for buffer strip enhancement.

Connecticut Valley Inventory, Vol. I and II, NH Connecticut River Valley Resource Commission (of the CRJC), 1989. Written in non-technical language, these two volumes are a source of basic information about the river and the NH side. Volume I covers corridor character, protected parcels, surface water quality, public access, boating suitability, fisheries, and endangered species. Volume II covers flood hazard areas and impoundments, aquifers, historic and archeological resources, and wildlife.

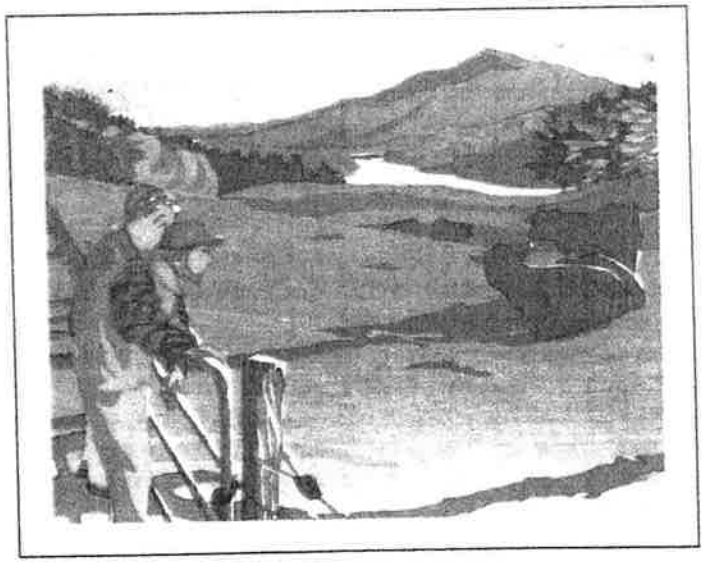
Findings to Support Classification of Segments of the Connecticut River, Connecticut River Valley Resource Commission, 1991. These findings, prepared with the help of citizens along the length of the river, nominated 34 specific segments of the river in several categories for classification and instream protection through the New Hampshire Rivers Management and Protection Program.

Natural Resources: An Inventory Guide for New Hampshire Communities, Upper Valley Land Trust and UNH Cooperative Extension Service, 1992. This manual is intended to help volunteer groups prepare, evaluate, and use the results of a local natural resource inventory. The text covers mapping options, and discusses a number of features a community might want to include in its inventory.

MAPS

Ascutney River Subcommittee Connecticut River Corridor Land Use, Upper Valley/Lake Sunapee Regional Planning Commission, 1996. GIS map prepared for the Mt. Ascutney LRS with the support of NH DES, showing residential/commercial land use, croplands/pasture, forested land, farmsteads, gravel pits/utilities, and conservation lands in the area between Route 12A and the Connecticut River. Individual maps cover Plainfield, Cornish, Claremont, and Charlestown, NH. Scale 1:18,000

Highlights of the New Hampshire Natural Resource Protection Project, New England Interstate Water Pollution Control Commission and the Environmental Protection Agency, 1996. GIS map prepared for the Mt. Ascutney LRS shows agricultural lands, unfragmented natural lands and shorelines, high value freshwater wetlands, drinking water supplies and pollution threats, bald eagle wintering sites, conservation and public lands, and some natural heritage inventory sites. Copies of the map have been provided to NH riverfront towns through the LRS.



ACKNOWLEDGMENTS

The strength of this plan lies largely within its creation by a cross-section of local citizenry. From time to time, however, the local subcommittee called upon the expertise of state agencies and other professionals to educate them about issues of particular concern. We would like to express our gratitude to those who lent their time to share information with the Mt. Ascutney River Subcommittee:

Larry Bandolin, U.S. Fish and Wildlife Service
Ken Cox, VT Fish and Wildlife Department
Geoff Dates, River Watch Network
Chris Fichtel, VT Natural Heritage Inventory Program
Dick Flanders, Surface Water Quality Bureau, NH Department of Environmental Services
Judy Hayward, Historic Windsor, Inc.
Mike Kline, Water Quality Division, VT Agency of Natural Resources
Jim MacCartney, Rivers Coordinator, NH Department of Environmental Services
David Moore, NH Natural Heritage Inventory Program
Norm Olson, U.S. Fish and Wildlife Service
David Skinas, VT Division for Historic Preservation
Ken Sprankle, NH Fish and Game Department
Harry Thompson, Supervisor of Bellows Falls Station, New England Power Company
Susi von Oettingen, U.S. Fish and Wildlife Service

Technical assistance
Mapping and other technical assistance was generously provided by the Upper Valley/Lake Sunapee Regional Planning Commission (NH), Southern Windsor County Regional Planning Commission (VT), the Conte Refuge Planning Project of the U.S. Fish and Wildlife Service, New England Interstate Water Pollution Control Commission, Upper Valley Land Trust, VT and NH Natural Heritage Inventory Programs, Natural Resources Conservation Service, Cooperative Extension Service, VT and NH offices of historic preservation, and Connecticut River Watch Program.

Illustrations
The Connecticut River Joint Commissions are pleased to feature the artwork of Connecticut River Valley artists.

- *Matt Brown* of Lyme, NH created the cover illustration using a self-taught method which pursues the tradition of color woodbock printing developed in Japan during the 18th century. Each color is printed from a separate carved block, using rice paste as the binder and a hand-held baren and brushes as the printing tools. Matt is a state-juried member of the League of NH Craftsmen.
- *Joan Waltermire* of Flying Squirrel Graphics in Vershire, VT is the creator of pen and ink drawings of fish and wildlife, seen in Vermont Woodlands magazine and other publications.
- *Susan Berry Langsten* of Cottage Designs in Lebanon has contributed her pen and ink drawings to other CRJC publications, including the Challenge of Erosion and The Cultural Landscape of the Connecticut River Valley in New Hampshire and Vermont.
- *Christine (Fuchslocker) Castenas* of Charlestown, NH and New York City, did the farm-to-market drawing.
- *Cheryl Sallen*, a freelance graphic artist of Reading, Vermont, created the maps in consultation with Bill Bridge of the Upper Valley Land Trust.

Design & Printing

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We are particularly grateful to Historic Windsor, Inc. and to the City of Claremont for providing meeting space.

APPENDIX A

THE NEW HAMPSHIRE RIVERS MANAGEMENT & PROTECTION ACT (RSA 483)

The 1992 designation of the Connecticut River into the New Hampshire Rivers Management and Protection Program established the following classification criteria and management practices.

FOR ALL RIVER SEGMENTS

- management shall ensure rights of riparian owners to use the river for forest management, agricultural, public water supply, and other purposes compatible with instream public uses
- DES shall review and consider adopted local river corridor management plans before issuing permits
- water quality shall be restored to or maintained at least at the Class B level; significant adverse impacts on water quality or other instream public uses shall not be permitted
- no permanent channel alteration, including dredging, shall be permitted except for construction or maintenance of a project such as public water supply intake
- DES shall encourage vegetative bank stabilization
- land application of solid waste (except manure, lime, wood ash, sludge, septage) shall be immediately incorporated into the soil, and set back 250' from normal high water mark
  no new solid waste landfill within 500 year floodplain; any new landfill to be set back at least 100' from edge of floodplain and screened; may be 250' from river if outside 500 year floodplain
- any existing solid waste facility within 250' of river may continue to operate under existing permit provided it does not degrade beyond permit area
- protected instream flow level shall be established by DES
- no interbasin transfers of water shall be permitted
- motorized boats operating within 150' of shore shall travel at the slowest possible speed necessary to maintain steerage way, but at no time shall exceed 6 miles/hour (pre-existing state law)

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FOR A NATURAL RIVER SEGMENT

(One seven-mile segment of the Connecticut River between Brunswick, Vermont and Stratford, New Hampshire has been designated as "natural.")

- free-flowing segment of at least five miles in length
- high quality of natural and scenic resources
- shorelines in primarily natural vegetation; river corridors generally undeveloped
- development, if any, is limited to forest management and scattered housing
- minimum distance to paved public road is 250' except where sight and sound are screened by natural barrier
- management shall perpetuate natural character as defined above, and ensure rights of riparian owners to use the river for forest management, agricultural, public water supply, and other compatible purposes (in addition to that described above)
- no dam or other structure that alters natural character of river shall be constructed
- no channel alteration activities except temporary alterations to repair or maintain bridge, road, or riprap which was in place at time river was designated
- water quality shall be maintained at Class A or B or restored to Class A

- no new solid waste facility permitted in corridor; existing, permitted and secure landfill cannot be expanded within 100' of the 500 year floodplain, and must be visually screened with vegetation
- no new hazardous waste facilities storing for more than 90 days permitted within corridor
- non-motorized watercraft only except for emergency purposes

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FOR RURAL RIVER SEGMENTS

- river corridors are partially or predominantly used for agriculture, forest management, dispersed or clustered residential development
- some instream structures may exist, including low dams, diversion works, and other minor modifications
- no minimum distance for roads
- at least three miles in length
- existing water quality at least Class B or restorable to Class B
- management shall maintain and enhance natural, scenic, and recreational values of the river protection (in addition to that described above)
- no new dam shall be constructed; repair of failed dam permitted only at same location, same impoundment level within six years of date of failure
- new hydropower facilities may be allowed at existing dams only if they are run-of-the-river, include no significant diversions, and impoundment height is constant and not above maximum historic level

◆

FOR RURAL-COMMUNITY RIVER SEGMENTS

- flow through developed areas with existing or potential community resource values such as those defined in official town plans or land use controls
- river corridor has combination of open space, agricultural, residential, commercial, industrial land uses
- readily accessible by road or railroad
- may include impoundments or diversions
- at least three miles in length
- existing water quality at least Class B or restorable to Class B
- management shall maintain/enhance the natural, scenic, recreational and community values of the river
- management shall include rights to use river for residential, recreational, commercial, industrial, flood control and other community uses as noted
- no new dam shall be constructed; repair of failed dam permitted only at same location, same impoundment level and only within 6 years of date of failure
- new hydropower facilities may be allowed at existing dams only if they are run-of-the-river, include no significant diversions, and impoundment height is constant and not above maximum historic level

◆

FOR COMMUNITY RIVER SEGMENTS

- flow through developed or populated areas and possess existing or potential community resource values such as those identified in official town plans or land use controls
- combination of open space, agricultural, residential, commercial, industrial land uses; may include urban centers
- readily accessible by road or railroad
- may include existing/potential impoundments, hydropower diversions, flood control, water supply
- at least one mile in length

- existing water quality at least Class B or restorable to Class B
- management shall maintain/enhance natural, scenic, recreational, and community values of river
- management shall include rights to use river for hydroelectric energy production and flood control protection in addition to that described above)
- new dams permitted if consistent with protection of resources for which segment designated, and only if they are run-of-the-river, include no significant diversions, and impoundment height is constant and not above maximum historic level for site

DESIGNATIONS of the CONNECTICUT RIVER *(RSA 483:15)*

Rural river: from outlet of Fourth Connecticut Lake to a point .3 miles above Second Lake Dam
Community river: from the point above Second Connecticut Lake Dam to a point .3 miles below dam
Rural river: from point below Second Connecticut Lake Dam to a point .3 miles above First Lake Dam
Community river: from point above First Connecticut Lake Dam to a point .3 miles below the dam
Rural river: from point below First Connecticut Lake Dam to a point .3 miles above Murphy Dam
Community river: from point above Murphy Dam to a point 2 miles below Murphy Dam
Rural river: from point 2 miles below Murphy Dam to Bishop Brook in Stewartstown
Community river: from Bishop Brook to Leach Creek in Canaan, Vermont
Rural river: from Leach Creek to confluence with Mohawk River
Rural-community river: from confluence with Mohawk River to the Columbia-Colebrook town line
Rural river: from the Columbia-Colebrook town line to Wheeler Stream in Brunswick, Vermont
Natural river: from Wheeler Stream to the Maidstone-Stratford Bridge
Rural river: from the Maidstone-Stratford Bridge to a point one mile above the breached Wyoming Dam
Community river: from one mile above to one mile below the breached Wyoming Dam
Rural river: from one mile below the dam site to a point .3 miles above the Simpson Paper Co. Dam
Community river: from .3 miles above the Simpson Paper Co. Dam to .3 miles below the dam
Rural river: from the point below the Simpson Paper Co. Dam to .4 miles above the Moore Dam
Community river: from .4 miles above the Moore Dam to .6 miles below the Moore Dam
Rural river: from the point below the Moore Dam to a point .3 miles above the Comerford Dam
Community river: from the point above the dam to a point .2 miles below McIndoes Falls Dam
Rural river: from the point below the dam to a point .3 miles above the Ryegate Dam (Dodge Falls)
Community river: from the point above the Ryegate Dam to a point .2 miles below the dam
Rural river: from the point below the Ryegate Dam to the Ammonoosuc River in Bath
Community river: from the Ammonoosuc River to the point where routes 135 and 10 meet in Haverhill
Rural river: from this intersection to Storrs Pond Brook in Hanover
Rural-community river: from Storrs Pond Brook to Dothan Brook outlet in Hartford, Vermont
Community river: from Dothan Brook to .3 miles below the Wilder Dam
Rural-community river: from .3 miles below Wilder Dam to the Lebanon-Plainfield town line
Rural river: from Lebanon-Plainfield town line to Blow-Me-Down Brook in Cornish
Rural-community river: from Blow-Me-Down Brook to northern end of Chase Island in Cornish
Rural river: from northern end of Chase Island to southern side of Williams River in Bellows Falls
Community river: from southern side of Williams River to the Saxtons River in Westminster
Rural-community river: from the Saxtons River to the bridge between Westminster Station and Walpole
Rural river: from the bridge to the Brattleboro-Dummerston town line
Rural-community river: from Brattleboro-Dummerston town line to Sprague Brook
Community river: from Sprague Brook to a point .3 miles below the Vernon Dam
Rural river: from below the Vernon Dam to the Massachusetts border

APPENDIX B

NEW HAMPSHIRE COMPREHENSIVE SHORELAND PROTECTION ACT (RSA 483-B)

Minimum protection measures defined by this Act appear below. The Connecticut River and others designated into the New Hampshire Rivers Management and Protection Program before January 1, 1993 are presently exempt. Shoreland protection for these rivers is the responsibility of riverfront communities and, in the case of the Connecticut River, the CRJC and the local subcommittees. In the event that the New Hampshire cities and towns along the river do not adopt the proposals made in the plan prepared by their local subcommittee, the legislature will re-examine the exemption provided in RSA 483-B and propose minimum standards defined by the Act for the area within 250 feet of the river's ordinary high water mark. In either case, the riverfront community must adopt river protection standards into its local zoning ordinance.

For further information, contact the Shoreland Coordinator at NH Dept. of Environmental Services at 603-271-3503.

LIMITS WITHIN THE PROTECTED SHORELAND

250 ft

- Prohibited Uses:
  - Establishment/expansion of salt storage yards, auto junk yards, solid waste & hazardous waste facilities.
  - Use of fertilizer, except limestone, within 25 feet of the reference line. Low phosphate, slow release nitrogen fertilizer allowed beyond 25 foot zone.
- Uses Requiring State Permits:
  - Public water supply facilities
  - Public water & sewage treatment facilities
  - Public utility lines
  - Existing solid waste facilities
  - All activities regulated by the DES Wetlands Bureau per RSA 482-A

OTHER RESTRICTED USES

- All new lots, including those in excess of 5 acres, are subject to subdivision approval by DES.
- Setback requirements for all of new septic systems are determined by soil characteristics.
- Minimum lot size in areas dependent on septic systems determined by soil type.
- Alteration of Terrain Permit standards reduced from 100,000 square feet to 50,000 square feet.
- Total number of residential units in areas dependent on on-site sewage & septic systems, not to exceed 1 unit per 150 feet of shoreland frontage.

NATURAL WOODLAND BUFFER RESTRICTIONS

150 ft

- Where existing, a natural woodland buffer must be maintained.
- Tree cutting limited to 50% of the basal area of trees, and 50% of the total number of saplings in a 20 year period. A healthy, well-distributed stand of trees must be maintained.
- Stumps and their root systems must remain intact in the ground within 50 feet of the reference line.

NEW SEPTIC SYSTEM LEACHFIELD SETBACKS

125 ft

100 ft

75 ft

- 125 feet where soil down gradient of leachfield is porous sand & gravel.
- 100 feet where soil maps indicate presence of soils with restrictive layers within 18 inches of natural soil surface.
- 75 feet where soil map indicates presence of all other soil types.
- 75 feet minimum setback from rivers.

PRIMARY BUILDING LINE*

50 ft

- Primary buildings setback behind line.

REFERENCE LINE

- For coastal waters = highest observable tide line
- For rivers = ordinary high water mark
- For natural fresh water bodies = natural mean high water level
- For artificially impounded fresh water bodies = water line at full pond

* If a municipality establishes a shoreland setback for primary buildings, whether greater or lesser than 50 feet, that defines the Primary Building Line for that municipality.

APPENDIX C

CURRENT TOWN REGULATIONS
Regarding the Connecticut River

CHARLESTOWN

Aquifer Protection Regulations: see attached watershed zone
Shoreline Protection Regulations:

- Subdivision Regulations require flood proofing in new subdivisions
- No construction in flood hazard area
- Uses FEMA construction criteria for floodplain area

Watershed zone requirements:

- 5 acres minimum lot size, one dwelling, agriculture and forestry appropriate to zone, and special exceptions for home occupations only
- Herbicides must be approved by the NH Pesticide Control Board as appropriate to water supply area
- No herbicides in buffer strips adjacent to or crossing streams in the watershed zone

Wetlands Protection Regulations: None
Sediment and Erosion Control Regulations:

- Subdivision requires sediment and erosion control plan
- In the watershed zone, farmers must employ measures to prevent erosion, sedimentation and pollution
- Landowners and loggers must work in a manner that will prevent erosion and sedimentation in the watershed zone

CLAREMONT

Ordinance states that development may be prohibited or restricted, or larger lot sizes may be required, if water quality standards are not preserved.
Aquifer Protection Regulations: None specifically
Shoreline Protection Regulations:
Floodplain District: FEMA construction requirements.

- Flood capacity of watercourse may not be diminished without local zoning permit, or federal or state permits

Streambank District Overlay

- No structures within 50 feet of the ordinary high water mark, no fill or excavation that would alter the hydraulics of the watercourse, no on-site sewage disposal, no dumping (except agricultural), and no construction (except bridges)

Wetlands Protection Regulations: None
Sediment and Erosion Control Regulations: Standard controls

CORNISH

Aquifer Protection Regulations:

- No part of a septic tank, or of a drainage field of a private on-lot sewerage treatment facility, shall be within 10 feet of a property line or 100 feet of an existing or proposed water supply

Shoreline Protection Regulations:

- Minimum distance between sewage disposal systems and water bodies, watercourses and wetlands shall be 100 feet
- Minimum distance between roads, drives and parking areas, and water bodies, watercourses and wetlands shall be 100 feet, except by special exception
- Setbacks shall not be reduced, except in accordance with VII C-5
- No expansion of an existing non-conforming structure (by special exception) that would involve a significant increase in sewage loading or other pollutants within the wetlands, shoreland, Connecticut River and regulatory floodplain district

Floodplain District as delineated by FEMA

- All structures prohibited

Shoreland Conservation Overlay District

- Lands within 100 feet of the shore of all watercourses and water bodies. The 100 feet distance shall be measured horizontally from the top of the bank above the watercourse or water body.

- No construction or erection of any structure, and no alteration of natural surface configuration.
- Special exceptions limited to water impoundments, non-commercial, non-residential water dependent uses, road crossings, and access ways.
- No use which utilizes, stores, processes or disposes of toxic substances
- No underground storage tanks

Connecticut River Shoreline Overlay District

- All lands within 100 feet of the Regulatory Floodplain along the Connecticut River - no erection or construction of any structure, no alteration of surface configuration, special exceptions limited to forestry and tree farming, and parks and outdoor recreation.

Wetlands Protection Regulations:

Wetlands Conservation Overlay District

- All areas comprising bogs, marshes, swamps and other poorly drained or very poorly drained soils, together with 100 foot buffer zones around such areas - no erection or construction of structures, no alteration of surface configuration by fill, excavation or dredging
- Special exceptions limited to water impoundments, non-commercial, non-residential water dependent uses, i.e. docks and boat houses, access, wells and water lines
- No use which utilizes, stores, processes or disposes of toxic substances, no underground fuel storage tanks

Sediment and Erosion Control Regulations:

- Standard controls in subdivision regulations

PLAINFIELD

Aquifer Protection Regulations: None

Shoreline Protection Regulations:

Floodplain Overlay District - determined by the areas designated as the regulatory floodway

- Boundary and Floodway Maps prepared by FEMA
- Allows structures in the floodplain, but building permit applications must be reviewed to make sure sites will be reasonably safe from flooding (new and improvements)
- Along watercourses that do not have a regulatory floodway: no encroachments no new construction, substantial improvements, or other development unless applicant proves that it will not increase the water surface elevation of the base flood more than one foot at any point in the community.

ROCKINGHAM

Aquifer Protection Regulations:

- On-site sewage disposal ordinance with 100' buffer around water supplies and 250' buffer for water courses or bodies of water used as public water supply

Shoreline Protection Regulations:

- Flood Hazard bylaw designates flood prone areas
- 100' buffer zones for streams and ponds are designated and mapped

Watershed zone requirements:

- Village of Bellows Falls Watershed District limits uses to forestry, wildlife refuge, and water supply

Sediment and Erosion Control Regulations:

- Subdivision regulations include provisions to address

SPRINGFIELD

Aquifer Protection Regulations:

If a subdivision is within a ½ mile of public sewer system, the Commission may require connection to the public system by the divider.

Aquifer Recharge Protection Area (Primary)

- Permits residential uses only
- Prohibits in-ground storage tanks for petro-chemical or any toxic or hazardous material
- All construction and dwellings must be served by municipal sewer
- Prohibits home occupations/business that could conceivably generate/utilize toxic or hazardous materials
- All applications must be submitted to the Department of Public Works for review and comment

Aquifer Recharge Protection Zone (Secondary)

- Restricts development to uses permitted in the general business zone, which would include such businesses as retail stores, professional offices, printing, recreation, public buildings, etc., and uses allowed in the Medium Density Residential Zones.
- Same specific standards as for the Primary recharge zone listed above
- No storage of flammable materials over 500 gallons without a zoning permit. Bulk storage permitted in General Business and Industrial Zones only.

Shoreline Protection Regulations: FEMA
Wetlands Protection Regulations: None
Sediment and Erosion Control Regulations: Standard Controls

WEATHERSFIELD

Aquifer Protection Regulations:

- No drilling of wells more than 50 feet deep or with greater than 25,000 gallons per day, other than farm or residence, without state permit
- All subsurface sewage disposal systems shall be located at least 100 feet from a water supply
- All subsurface sewage disposal systems shall be located at least 250 feet from a watercourse or standing water body used as a source of public drinking water

Shoreline Protection Regulations:

- Prohibits construction of ponds upon any permanent or seasonal stream, or using stream water as a source unless approved by Vermont Dept. of Fish & Wildlife

Floodplain Regulations - FEMA

- No structures, storage of materials and equipment, borrowing of fill, channel modification, etc., without conditional use permit

Streambank Conservation

- Requires undisturbed natural buffer zone
- No new development or manipulation of vegetation in buffer strips

WIDTH OF BUFFER

Percent Slope of Adjacent Land	Intermittent and Permanent Streams <10' average channel at highwater	Lakes, Ponds, Rivers & Streams >10' average channel at highwater (add 20 ft for each additional 10% of slope)
01 - 10%	25 ft	50 ft
11 - 20%	45 ft	70 ft
21-30%	65 ft	90 ft
31-40%	85 ft	100 ft

Connecticut River Setbacks

- Minimum setbacks along the Connecticut River shall be 100 horizontal feet from the mean high water mark
- Construction of docks and landings conditional upon approval from the Army Corp of Engineers, Vermont Natural Heritage Program, and Vermont Dept. of Fish & Wildlife

Wetlands Protection Regulations:

- 50 feet buffer for Class 2 wetlands, 100 feet buffer for class 1 wetlands
- No development, dredging, ditching or manipulation of vegetation permitted in buffer strip or wetland unless in conformance with VT Wetland Rules.

Sediment and Erosion Control Regulations: Standard controls

WINDSOR

Aquifer Protection Regulations:

- May require that community sewage disposal systems be designed in such a way that they may eventually be connected to a municipal sewage disposal system
- No storage of flammable liquids over 500 gallons without a zoning permit

Shoreline Protection Regulations:

- Subdivision proposals shall be consistent with the need to minimize flood damage
- FEMA
- No building (except related to water recreation), no filling of land within 50 ft from normal high water mark of awaterbody

Wetlands Protection Regulations: None

Sediment and Erosion Control Regulations:

- Requires stormwater drainage easement to encompass the 25 year flood area of any existing watercourse
- Standard controls

HARTLAND

Aquifer Protection Regulations: None

Shoreline Protection Regulations:

- Floodplain Overlay District/FEMA
- No structures except by special exception

Wetlands Protection Regulations: None

Sediment and Erosion Control Regulations: None

Prepared with the assistance of the Upper Valley/Lake Sunapee and Windham regional planning commissions, supported by Clean Water Act funding through the States of NH and VT.

APPENDIX D

TOOLS FOR PROTECTING RIVERFRONT LANDS & WATER QUALITY

STATE STATUTES

NEW HAMPSHIRE

NH's Comprehensive Shoreland Protection Act (RSA 483-B) sets minimum shoreland protection standards for shore lands along New Hampshire's great ponds, rivers, artificial impoundments and coastal waters. These standards are designed to minimize shoreland disturbance in order to protect the public waters, while still accommodating reasonable levels of development in the protected shoreland. Although the act sets minimum standards, section 483-B:8 gives municipalities the authority to adopt land use control ordinances which are more stringent. This section also encourages communities to adopt ordinances to protect non-public waters. The Connecticut River, having been designated into the NH Rivers Management and Protection Program prior to 1993, is exempt from the statute. However, towns along the river have the opportunity to examine their sections of the river and in those sections where it is appropriate, recommend stronger controls than those set forth in the legislation.

VERMONT

Section 1422 of Title 10 of the Vermont Statutes gives towns the authority to regulate shore lands to prevent and control water pollution; preserve and protect wetlands and other terrestrial and aquatic wildlife habitat; conserve the scenic beauty of shore lands; minimize shoreland erosion; reserve public access to public waters; and achieve other municipal, regional or state shoreland conservation and development objectives. Other state regulations set standards for management of agricultural land, silvicultural practices, and sediment and erosion control. In-stream water quality continues to be directly regulated at the state level, including withdrawals and discharges from and into surface waters.

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LOCAL TOOLS

Besides the state statutes, many tools are available to communities and individuals to protect water quality; some are of a regulatory nature, some are non-regulatory. Local tools can include adopting a master plan (town plan) and/or water resources management plan with strong recommendations for protecting water quality, scenic views, agricultural soils, riparian buffers, prime wetlands, floodplains, open space, and wildlife habitat. These recommendations could then be carried through to regulatory documents such as zoning, subdivision and site plan review.

LOCAL REGULATORY MEASURES

Floodplain Ordinances

Floodplain ordinances can prohibit construction in the floodplain. Floodplains provide flood storage, wildlife habitat and essentially act as buffers to protect water quality. Construction, development, or filling in of floodplains removes flood storage and displaces floodwater to locations further downstream. There is the added benefit of protecting buildings from flood damage which costs taxpayers millions of dollars each year.

Shoreland Overlays

A community could also adopt a shoreland protection ordinance or a buffer overlay to the zoning ordinance in which protection measures for surface waters can be more closely defined than for the rest of the town. In both states the requirements of the shoreland ordinance supersede that of the underlying zoning ordinance. In 1994 the New Hampshire Office of State Planning updated its model shoreland protection ordinance to be consistent with the requirement of NH's Comprehensive Shoreland Protection Act.

Others

- separation of storm water and wastewater in municipalities with combined sewer overflows;
- confinement of the amount of impervious surface created by new development to reduce the transportation of sediments and nutrients
- use of sediment and erosion control measures during and after construction

LOCAL NON-REGULATORY METHODS

Vegetated Buffers

The use of riparian buffers can be either regulatory or voluntary, and is one of the best and most commonly used methods of protecting surface water. This strip of natural or planted vegetation along the riverbank can intercept harmful nutrients, toxic chemicals and sediments before they enter the surface waters, and control bank erosion. Vegetated buffers are relatively inexpensive and have the added advantage of providing habitat for both land based and aquatic animal species and privacy for landowners. Shading streams with vegetation helps to optimize light and temperature conditions critical to the survival of certain species, such as trout. Naturally vegetated buffers promote high biological productivity and diversity.

Conservation Easements

- purchase or donation of development rights
- acquisition of land or rights of way

Towns or conservation groups can use these tools to provide a buffer on land adjacent to surface waters and wetlands, to protect water quality and provide public access without creating new regulations. Prime agricultural soils, sites for rare and endangered species, and historic and archaeological sites can be protected in the same manner.

Incentives

- current use assessment program
- encourage farmers to use the established and extensive resources of the State Department of Agriculture and the Natural Resources Conservation Service (NRCS) to develop and implement a land management plan which incorporates the use of best management practices

Education programs

Education programs through schools and non-profit education and land use organizations can increase the awareness of the general public regarding private property rights and ways to control nonpoint pollution on private land. Programs should emphasize the locations and use of existing public access and asking permission before stepping on private property.

APPENDIX E

SELECTED BEST MANAGEMENT PRACTICES

Long experience with the water quality impacts of various kinds of land management has led the states of Vermont and New Hampshire to develop detailed guidance for landowners and towns in how to best manage land to minimize nonpoint pollution. Below is a general summary of selected practices for a variety of activities.

Each state has its own approach to these land management practices. For instance, spreading of manure in the winter, when it is likely to wash into streams because the frozen ground cannot absorb it, is highly discouraged by New Hampshire but prohibited between December 15 and April 1 by Vermont's rules for "acceptable agricultural practices." Contact the New Hampshire Dept. of Environmental Services or Vermont Agency of Natural Resources, or your county office of the Natural Resources Conservation Service, for information on the guidance or regulations which apply in your area (see Appendix G).

CONSTRUCTION SITES

Ensure good oversight of erosion and sedimentation control.

- provide erosion, sedimentation, and stormwater management plans
- use all natural resource information, including soils, topography, and geology

Minimize the amount of bare soil exposed.

- limit clearing on building sites and rights-of-way
- cluster buildings; build one phase at a time
- mulch all bare soil as soon as possible, before storms or rainfall
- stabilize, seed and mulch the area when soil will be exposed for an extended period

Minimize water-impervious surfaces that increase runoff.

- minimize the area of roofs, roads, sidewalks, and parking lots
- leave undisturbed as much of the site's natural vegetation as possible
- consider using porous pavement

Direct water away from construction areas.

- don't concentrate stormwater into channels
- redirect clean water that could otherwise drain onto the construction site
- schedule work during periods of low water, low rainfall, and when vegetation can best be established
- work with the natural contours of the site; use natural drainways (not man-made ones or streambeds)
- avoid building roads up and down steep slopes
- provide ditches and channels of sufficient stability and capacity to handle storm runoff velocities
- install ditch turnouts so that runoff flows into vegetated areas
- use natural ground cover (such as grass) on slopes and in drainage ditches
- use wet (retention) ponds to trap sediment and phosphorus
- ensure that storm and other drainage systems (not wastewater systems) empty into adequately sized channels and don't enter sewage systems

Protect existing stormwater inlets and culverts from sediment.

- mulch all bare soils
- install silt fencing and hay bale filters
- use sediment traps in larger ditches
- install a temporary, perforated riser at culverts

Make sure your erosion control measures are effective.

- adjust, maintain, and repair erosion controls after every storm event
- remove all temporary measures once construction has ceased and vegetation has taken root

DEVELOPED AREAS

Minimize pollutants washed into waterways from developed sites.

- use natural vegetation or new landscaping to act as a filter or buffer
- limit the amount of clearing
- divert runoff around sites where it could pick up pollutants
- keep parking areas, outdoor storage areas, and streets clean of debris
- maintain catch basins to prevent backup
- use grassed swales, constructed wetlands, detention ponds, wet ponds, and catch basins
- direct water away from unpaved road surfaces and keep runoff velocities low

TIMBER HARVESTING

Control erosion on exposed soils.

- construct water bars, turn-ups, and ditches on sloped trails and haul roads to divert runoff into the forest
- use appropriate method of wetland or water crossing for size of stream and traffic it must bear cross streams at right angles
- keep steep road pitches to a minimum and run skid trails at an angle to the slope
- size culverts properly; use on all truck road crossings of permanent streams
- maintain filter strips between logging operations and water bodies
- locate landings and roads on level or gently sloping ground, away from water bodies
- install water diversions at log landings to prevent sedimentation
- keep all slash away from streams and water bodies
- seed and mulch trails and exposed soils once operations are complete

AGRICULTURE, LAWNS, and GOLF COURSES

Keep fertilizers from fertilizing waterways.

- tailor the application of manure and fertilizer to the nutrient needs of the crop
- use soil tests to determine current nutrient levels and soil pH
- diversify crop rotations and plant cover crops after harvesting to use residual nutrients
- avoid spreading manure or fertilizer on frozen or snow covered ground
- incorporate manure into the soil as soon as possible after spreading
- do not store manure in the floodway or near wells
- maintain filter strips between surface waters and fields and feedlots
- control livestock access to water bodies
- divert runoff away from high animal use areas
- keep accurate fertilizer application and crop yield records
- manage milkhouse and parlor wash water
- store manure in properly constructed and located facilities

Control sedimentation and erosion.

- plant crops along contour lines
- rotate crops that provide limited ground cover with those that provide generous ground cover
- maintain filter strips between fields and surface waters
- plant cover crops or maintain residue cover on the fields after harvest
- construct and stabilize diversions to control runoff across cropland and control erosion in gullies
- keep livestock off bare streambanks
- set farm buildings back from streams

Use pesticides carefully.

- apply pesticides only when needed
- consider using integrated pest management to reduce pesticide use
- apply, store and handle pesticides properly
- obtain training in pesticide application or hire a licensed applicator
- do not spray or apply pesticides on windy days or before a heavy rain storm

ROAD SALTING AND SNOW STORAGE

It is illegal in both states to dump plowed snow directly into water bodies.

Keep salt, sand, and other pollutants in winter snow piles out of waterways.

- store disposed snow near flowing surface waters, but at least 25' from the high water mark, in order to dilute the salt with river water and avoid impacts to ground water, lakes, and wetlands; solid materials contained in the snow remain on the land surface and should be removed each spring
- avoid storing snow near water supply wells
- store salt piles under cover and on a flat, impervious surface so salt does not wash into the ground
- remove sand from streets in early spring

Apply road salt carefully.

- identify sensitive areas such as public water supplies and ponds, and consider de-icing alternatives
- give salt time to work; know when to plow and reapply salt
- determine salt application rates and frequency for all roads in a service area
- apply salt in a 4-8' wide center strip along lesser traveled roads
- use ground-speed controllers on spreaders

CHEMICAL AND PETROLEUM PRODUCTS

Keep these pollutants out of ground and surface waters.

- ensure that chemicals are recovered, recycled, or reused wherever possible
- have a spill prevention and response plan, with containment equipment readily available
- store containers and transfer chemicals only in areas that will contain spills, and away from waters, storm drains, and wells
- inspect regularly for leaks or potential contact with stormwater
- schedule routine cleanup operations
- do not allow floor drains and work sinks to discharge into or onto the ground

SEPTIC SYSTEMS

Keep the system working well to prevent groundwater pollution.

- know the location of septic tank and leach field; mark tank cover
- inspect tank frequently and pump it out at least every 3 years
- use water conservatively
- keep vehicles and livestock off the system
- do not use kitchen garbage disposal, which can clog the system
- do not pour caustic or toxic materials down the drain; these may kill necessary bacteria and contaminate sludge later intended for land application
- do not flush bulky items such as disposable diapers or sanitary pads into the system
- avoid putting food waste and grease into the system
- keep deep rooted trees and shrubs away from the leach field

Encourage local oversight.

- consider a town septic system education and inspection program
- consider adopting a local health ordinance for septic system regulation

DOCKS, MOORINGS, AND MARINAS

Ensure that new marinas are properly constructed to minimize water pollution.

- minimize the amount of paved, impervious surface
- limit use of pressure-treated lumber
- retain natural, vegetated buffers along the shore where possible
- provide erosion, sedimentation, and stormwater management plans

Prevent pollution from marina and boating activities.

- use only phosphate-free detergents and treat wash water before it enters the waterbody
- perform engine maintenance out of the water
- use propylene glycol as an antifreeze
- conduct painting and scraping where debris will not enter the water
- provide for spill containment
- install catch basins around boat launches to trap pollutants
- provide public restrooms and pumpout facilities to limit input of wastewater into water bodies
- use an on-board holding tank

Avoid introducing exotic species.

- remove plant fragments from boats and trailers
- wash boat and flush cooling system; leave boat out of water for 48 hours after boating in a contaminated waterbody

SAND AND GRAVEL EXCAVATION

Avoid pollution of nearby drinking water supplies and surface waters.

- investigate proposed pit areas during planning; allow space for mild pit slopes, diversions, and setbacks from abutters, water bodies, and drinking water supplies
- provide buffer strips of natural vegetation
- maintain 5 feet of unexcavated material above the seasonal high water table as a filter
- do not store petroleum products in the pit area
- develop spill prevention plan and clean up spills immediately
- maintain and wash equipment outside the pit area
- control dust to prevent nuisance and public hazard; use water rather than calcium chloride; never use oil
- use retention basins to trap fine material; clean out regularly
- use anti-tracking pads at gravel pit access roads to dislodge mud from tires

Reclaim excavations.

- leave surface soil which can sustain vegetation, and plant with grass or seedlings to prevent erosion
- grade slopes to at least the natural angle of repose
- restore original, natural drainage

BIOSOLIDS

Reduce risk of nutrient contamination of surface or subsurface water.

- do not store or apply biosolids near surface water or wells
- do not apply biosolids during time of high water table
- total available nitrogen should not exceed crop requirements

Reduce risk of contamination of feed crop lands.

- prioritize non-cropland or non-food crop lands for application
- for feed crop land, apply in fall before soil freezes or prior to planting
- avoid application where food crops are grown, especially leaf and root crops
- manage and monitor the land carefully

Apply and monitor carefully.

- select weather conditions when odors will dissipate quickly
- test soil nitrate levels annually
- calibrate equipment for uniform application rates
- avoid use of heavy equipment on wet soil
- do not apply on frozen, excessively wet, or snow-covered ground
- monitor the site and maintain at pH 6.5 long-term
- keep good crop records on individual fields

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PUBLICATIONS

NEW HAMPSHIRE

- *Best Management Practices to Control Nonpoint Source Pollution: A Guide for Citizens and Town Officials*, NH Dept. of Environmental Services, 1994.
- *Best Management Practices for Urban Stormwater Runoff*, NH Dept. of Environmental Services, 1996
- *Stormwater Management / Erosion and Sedimentation Control Handbook for Urban and Developing Areas in New Hampshire*, NH Dept. of Environmental Services, 1992
- *Best Management Wetland Practices for Agriculture*, NH Dept. of Agriculture
- *New Hampshire's Manual of Best Management Practices for Agriculture*, NH Dept. of Agriculture, 1993
- *Resource Manual: Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire*, NH Division of Forests and Lands, 1991.
- *Best Management Practices: Biosolids*, UNH Cooperative Extension, 1995

VERMONT

- *Vermont Agricultural Nonpoint Source Pollution Reduction Program Law and Regulations*, VT Dept. of Agriculture, Food and Markets, 1996
- *Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont*, VT Dept. of Forests, Parks, and Recreation, 1987
- *Vermont Handbook for Soil Erosion and Sedimentation Control on Construction Sites*, VT Agency of Natural Resources, 1982
- *Vermont Streambank Conservation Manual*, VT Agency of Natural Resources, 1987
- *Vermont Better Backroads Manual*, George D. Aiken/Northern VT Resource Conservation & Development Councils, 1995
- Wetland Fact Sheets: "Erosion Control," "Agricultural Activities in Wetlands," "Stormwater and Wetlands," VT Dept. of Environmental Conservation, 1992
- "Road Salt and Salted Sand Storage Guidelines," Dept. of Environmental Conservation, 1993

CONNECTICUT RIVER JOINT COMMISSIONS

- *The Challenge of Erosion in the Connecticut River Watershed*, 1996
- *The Watershed Guide to Cleaner Rivers, Lakes, and Streams*, 1995
- *A Homeowner's Guide to Controlling Nonpoint Source Pollution in the Connecticut River Valley*, 1994

APPENDIX F

GUIDE TO PERMITS

GET THE RIGHT PERMITS FOR PROJECTS NEAR RIVERS AND STREAMS

Any work you do near a river or stream can affect other landowners and public values such as water quality, fish, wildlife, and flood control. To protect the public's interests, federal, state and local governments have developed laws, rules, and ordinances for projects in or near rivers and streams. Permits and approvals are necessary for streambank stabilization, construction, and other earth disturbances on the bank or in the bed of a stream. It is important that the necessary approvals and permits are obtained before any work is begun. Penalties exist for unauthorized work.

LOCAL CITY OR TOWN

Contact: Selectmen's Office/Town Manager/Zoning Administrator

Provides Information About: Local Zoning Regulations and/or Federal Emergency Management Agency (FEMA) regulations for work in the floodplain and wetland protection.

STATE OF NEW HAMPSHIRE

All projects in New Hampshire must be reviewed by the NH Wetlands Board, which has been charged by the legislature with protecting the State's submerged lands and wetlands from despoliation and unregulated alteration (RSA 482-A). A wetlands permit is required to excavate, remove dredge, fill, or build a structure in or on the bank of any surface waters or wetlands in the state. Surface waters include lakes, rivers, brooks and perennial or seasonal streams, but exclude sheet runoff in the absence of a defined channel or wetland vegetation. Projects that significantly expose raw earth may require an Alteration of Terrain permit.

I. Wetlands Permit

A. *Obtain Application* from your Town Clerk or Wetlands Bureau

B. *Primary Permit Requirements are explained in:* NHDES fact sheet, "Wetland Permits for Bank Stabilization" (Technical Bulletin #WRD-1991-5)

C. *Contact for Information:* Wetlands Bureau, NH Dept. of Environmental Services, 6 Hazen Drive, P.O. Box 95, Concord, NH 03301 • Phone: (603) 271-2147 – Fax: (603) 271-6588

D. *Fee Schedule:* Minimum filing fee of $50 for all Minimum Impact Projects. Additional filing fee may be required for Minor or Major Projects at $ .025/square foot of requested jurisdictional area impact.

E. *Other Considerations:* Contact Rivers Coordinator at NHDES • Phone (603)271-1152

1. *New Hampshire Rivers Management and Protection Act (RSA 483):* Projects on the Connecticut River and others designated under this program must meet the requirements of the law. Copies of all permit applications needing NHDES approval are also reviewed by the Rivers Coordinator and the local river management advisory committee. (Technical Bulletin NHDES-CO-95-2)

2. *Comprehensive Shoreland Protection Act, (RSA 483-B):* Projects located on fourth order or higher rivers, except the Connecticut River and others designated for protection under RSA 483 prior to January 1, 1993, must comply with the minimum standards of this law which are usually added as a condition of the Wetlands Permit. Phone: (603)271-6876

II. Alteration of Terrain Permit

A. *Obtain Permit Application and Information* from: Water Supply & Pollution Control Division (WSPCD), NH Dept. of Environmental Services, 6 Hazen Drive, P.O. Box 95 Concord, NH 03302-0095 • Phone: (603) 271-3503 Fax: (603) 271-2867

B. *Primary Requirements for Permit:* Projects with significant alteration of 100,000 sq. ft. or more. Projects with significant alteration of 50,000 sq. ft. or more on rivers which fall under the jurisdiction of the Comprehensive Shoreland Protection Act (see above)

C. *Fee Schedule:* 50,000 - 199,000 sq. ft of disturbance requires a fee of $100. Add $100 for each additional 100,000 sq. ft thereafter

D. *Other Considerations:* New Hampshire Rivers Management and Protection Act, (see above)

III. Federal Clean Water Act Section 404 Permit and Section 401 Water Quality Certification
New Hampshire implements a State Program General Permit (NHSPGP) through the U.S. Army Corps of Engineers for activities involving dredge or fill in waters of the state and work affecting navigable waters. The NHSPGP excludes certain activities and is generally limited to minor or controversial activities. Projects which require a Section 404 permit from the Corps must also obtain a Section 401 Water Quality Certificate from NHDES-WSPCD.

A. *Contact for Information:* U.S. Army Corps of Engineers, Regulatory Division for Permits in NH. 424 Trapelo Rd., Waltham, MA 02254-9149 • Phone: (800)343-4789 – Fax: (617)647-8303

B. *Obtain Water Quality Certificate and Information from:* Surface Water Quality Bureau, Water Supply & Pollution Control Division, NH Dept. of Environmental Services, 64 North Main St., Concord, NH 03301 Phone: (603) 271-2457 Fax: (603) 271-7894

C. *Project Types:*
Minimum Impact Project: work can proceed following receipt of Wetlands permit (see above)
Minor Impact Project: work must wait 30 days after Wetlands Board approval for reply from Army Corps
Major Impact Project: work cannot proceed until after Wetlands Board approval and until Army Corps sends written confirmation that the project has been approved.

STATE OF VERMONT

The Vermont Stream Alteration Law, Title 10, Chapter 41, requires that all stream alteration projects which seek "to change, alter or modify the course, current or cross-section of any water course having a drainage area greater than 10 square miles by movement, fill or by excavation of 10 cubic yards or more of material," require a permit from the Stream Alteration Engineers of the VT Agency of Natural Resources.

I. Stream Alteration Permit

A. *Obtain permit application and information from:* (For projects located on the Ompompanoosuc River and north AND the Winooski River and north): VT Agency of Natural Resources, 184 Portland Street, St. Johnsbury, VT 05819 • Phone: (802) 748-8787 Fax: (802) 748-6687
(For projects on the White River and south AND Lewis Creek and south): VT Agency of Natural Resources, 450 Asa Bloomer Bldg, Rutland, VT 05701-5903 • Phone: (802) 786-5906 Fax: (802) 786-5915

B. *Fee Schedule:* $100 per permit

II. Federal Clean Water Act Section 404 Permit and Section 401 Water Quality Certification
Water Quality Certification is required for all projects regarding discharge and dredged or fill materials in waters of the U.S., regardless of the size of the watershed. Contacts are same as for stream alteration permits, above.

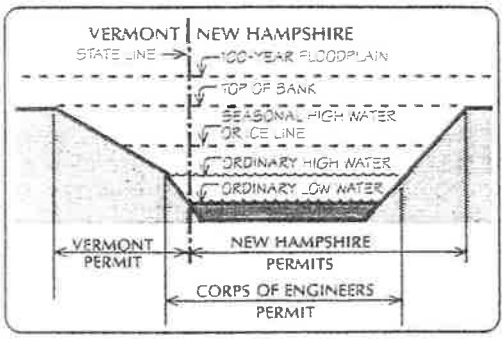
III. Wetlands Permit
If the proposed project is located in or near a wetland, a site visit may be necessary. Impacts may be addressed under Title 10 VSA, Chapter 37, Section 905(a), 401 Water Quality Certification and Act 250.

A. *Obtain permit application and information from:* Wetlands Coordinator, Water Quality Division, VT Agency of Natural Resources, Building 10N, 103 So. Main St., Waterbury, VT 05671 • (802) 241-3770

IV. Connecticut River Projects
The Ordinary Low Water mark (OLW) is the New Hampshire/Vermont state line. By agreement with the VT Agency of Natural Resources, permit applications involving the Connecticut River are reviewed by the local river management advisory subcommittee.

A. *For projects on the Vermont side of the Connecticut River riverward of the Ordinary Low Water mark*, contact NHDES to see if additional permits are required at: Wetlands Bureau, NH Dept. of Environmental Services, 6 Hazen Drive, P.O. Box 95, Concord, NH 03301 • Phone: (603) 271-2147 Fax: (603) 271-6588

B. *For projects on the Connecticut River landward of the Ordinary Low Water mark*, contact the U.S. Army Corps of Engineers for information about jurisdiction and application procedures at: U.S. Army Corps of Engineers, Regulatory Division, Camp Johnson, Bldg 10-18, Colchester, VT 05446 • Phone: (802) 655-0334 Fax (802) 655-0818



APPENDIX G

SOURCES OF ASSISTANCE

FEDERAL AGENCIES

Environmental Protection Agency
Region 1
JFK Building
Boston, MA 02203
617-565-9026

USDA Natural Resources
Conservation Service
- NH county offices:
  Coos County: 788-4651
  Grafton County: 747-2001
  Sullivan County: 863-4297
  Cheshire County: 352-3602
- VT county offices:
  Essex/Caledonia Counties: 748-3885
  Orange/Windsor Counties: 295-1504
  Windham County: 254-5323

USDA Cooperative
Extension Service
- NH county offices:
  Coos County: 788-4961
  Grafton County: 747-6944
  Sullivan County: 863-9200
  Cheshire County: 352-4550
- VT county offices:
  Essex/Caledonia Counties: 676-3900
  Orange/Windsor Counties: 296-7630
  Windham County: 257-7967

New England Interstate Water
Pollution Control Commission
255 Ballardvale St.
Wilmington, MA 01887
508-658-0500

National Park Service
Rivers and Trails Conservation
Assistance Program NH/VT
King Farm, 5 Thomas Hill
Woodstock, VT 05091
802-457-4323

U.S. Fish and Wildlife Service
Conte Refuge Planning Project
38 Avenue A
Turners Falls, MA 01376
413-863-3070

NEW HAMPSHIRE STATE AGENCIES

Dept. of Environmental Services
6 Hazen Dr., P.O. Box 95
Concord, NH 03302-0095
603-271-3503
- Rivers Coordinator: 271-1152
- Water Division: 271-3503
- Wetlands Bureau: 271-2147

Fish and Game Department
2 Hazen Dr.
Concord, NH 03301
603-271-3211

Dept. of Resources & Economic
Development
172 Pembroke Rd., P.O. Box 1856
Concord, NH 03302-1856
603-271-2411
- Natural Heritage Inventory:
  271-3623

Division of Historical Resources
19 Pillsbury St., P.O. Box 2043
Concord, NH 03302-2043
603-271-3558

Department of Agriculture
25 Capitol St., 2d Floor
P.O. Box 2042
Concord, NH 03302-2042
603-271-3551

Department of Safety
31 Dock Rd.
Gilford, NH 03246
603-293-0091

VERMONT STATE AGENCIES

Dept. of Agriculture, Food, &
Markets
116 State St.
Montpelier, VT 05620-2901
802-828-2500

Agency of Natural Resources
Dept. of Environmental
Conservation
103 S. Main St., 1 South
Waterbury, VT 05671-0401
802-241-3800
- Water Supply: 241-3400
- Water Quality: 241-3770
- Solid Waste Management: 241-3444

Dept. of Fish & Wildlife
103 S. Main St., 10 South
Waterbury, VT 05671-0501
802-241-3700
- Natural Heritage Inventory
  Program:241-3700

Dept. of Forests, Parks &
Recreation
103 S. Main St., 10 South
Waterbury, VT 05671-0601
802-241-3670

Department of Travel & Tourism
134 State St.
Montpelier, VT 05602-3403
802-828-3237

Division for Historic Preservation
135 State St., 4th Floor, Drawer 33
Montpelier, VT 05633-1201
802-828-3226

Housing &Conservation Board
136 ½ Main St., Drawer 20
Montpelier, VT 05620-3501
802-828-3250

Water Resources Board
58 E. State St. Drawer 20
Montpelier, VT 05620-3201
802-828-2871

REGIONAL PLANNING COMMISSIONS and Resource Conservation and Development Areas

Northeast Vermont Development Association
P.O. Box 640
St. Johnsbury, VT 05819
802-748-5181

North Country Council
107 Glessner Rd.
Bethlehem, NH 03574
603-444-6303

Upper Valley/Lake Sunapee RPC
77 Bank St.
Lebanon, NH 03766-1704
603-448-1680

Southwest RPC
20 Central Square, 2d Floor
Keene, NH 03431
603-357-0557

Two Rivers/Ottauquechee RPC
King Farm, 5 Thomas Hill
Woodstock, VT 05091
802-457-3188

Southern Windsor County RPC
Box 320 Ascutney Prof. Bldg., Route 5
Ascutney, VT 05030
802-674-9201

Windham Regional Commission
139 Main St., #505
Brattleboro, VT 05301
802-257-4547

George D. Aiken Resource Conservation & Development Area
P.O. Box 411
Randolph, VT 05060
802-728-9526

North Country Resource Conservation & Development Area
103 Main St., Suite 1
Meredith, NH 03253
603-279-6546

PRIVATE ORGANIZATIONS AND LAND TRUSTS

River Watch Network
New England Office
RR 1, Box 209
Hartland, VT 05048
802-436-2544

Connecticut River Watershed Council
1 Ferry St.
Easthampton, MA 01027
413-529-9500

NH Rivers Council
54 Portsmouth St.
Concord, NH 03301
603-228-6472

Vermont River Conservancy
RR 5, Box 920
Montpelier, VT 05602
802-229-9282

The Nature Conservancy- NH
2 ½ Beacon St., Suite 6
Concord, NH 03301
603-224-5853

The Nature Conservancy-VT
27 State St.
Montpelier, VT 05602
802-229-4425

Vermont Natural Resources Council
9 Bailey Ave.
Montpelier, VT 05602
802-223-2328

Audubon Society of NH
3 Silk Farm Rd.
Concord, NH 03301
603-224-9909

Society for Protection of NH Forests
54 Portsmouth St.
Concord, NH 03301
603-224-9945

Upper Valley Land Trust
19 Buck Rd.
Hanover, NH 03755
603-643-6626

Vermont Land Trust
8 Bailey Ave.
Montpelier, VT 05602
802-223-5234

Passumpsic Valley Land Trust
P.O. Box 124
St. Johnsbury, VT 05819
802-748-8089

Windmill Hill Pinnacle Association
RR 3 Box 248
Putney, VT 05346

Inherit New Hampshire
266 N. Main St.
Concord, NH 03301
603-224-2281

Vermont Institute of Natural Science
Church Hill Rd.
Woodstock, VT 05091
802-457-2779

Montshire Museum
P.O. Box 770
Norwich, VT 05055
802-649-2200

Bonnyvale Environmental Center
Old Guilford Road
Brattleboro, VT 05301
802-257-5785

NH Farm Bureau
295 Sheep Davis Rd.
Concord, NH 03301
603-224-1934

VT Farm Bureau
RR 4, Box 2287
Montpelier, VT 05602
802-223-3636

APPENDIX H

CONSERVATION EASEMENTS

Land trusts offer a voluntary mechanism for protecting individual parcels of land forever. Using a legal document known as a conservation easement, land trusts can ensure continued stewardship and productive use without relying on public regulation or public ownership.

Land subject to conservation easements remains in private ownership and can be sold, given or transferred at any time. A conservation easement assures the landowner that the resource values of his or her property will be protected forever, no matter who the future owners are.

What is a conservation easement?

A conservation easement is a legally enforceable agreement between a landowner and a private conservation organization (such as a land trust) or governmental agency that specifies forever, the types and locations of activities permitted on a particular parcel of land. A conservation easement is a deed "running with the land," and all future landowners are bound to the provisions of the easement deed.

Landowners place conservation easements on their properties voluntarily, working with land trusts to craft provisions that will protect the natural features of the property and meet the landowner's objectives. For instance, a landowner may choose to conserve some, but not all, of her land; or a landowner may wish to specify timber or habitat management standards to continue his investment in good stewardship.

Conservation easements are usually donated to land trust, but in certain cases, land trusts may purchase conservation easements. This is sometimes called "selling development rights."

Conserved land remains in private ownership, used for farming, forestry and other activities that are consistent with the purposes of the conservation easement deed. The land trust accepts the responsibility of monitoring the property - forever - to ensure compliance with the terms of the conservation easement.

Does a conservation easement allow public access to the property?

Landowners who grant conservation easements make their own choice about whether to open their property to the public. A conservation easement does not allow access to the general public unless the landowner has specifically provided for access in the easement agreement.

Public access is more often granted when the property has a history of public use and is perceived to be a recreational resource. Some landowners provide public access rights to a limited area, such as allowing fishing in designated areas or hiking along a clearly defined corridor. Landowners may choose to permit public access for specific purposes (scientific research, education, or hunting, for example). Some landowners restrict public access to particular types of activities, such as walking, skiing, biking, or horseback riding.

Conservation easements do permit regular access by the land trust for the purpose of monitoring the use and activities on the property to ensure that the terms and conditions of the conservation easement are upheld.

Who can grant an easement?

Any owner of property with conservation values may grant a conservation easements. If the property belongs to more than one person, all owners must consent to granting an easement. If the property is mortgaged, the owner must obtain an agreement from the lender to subordinate its interests so that the easement cannot be extinguished in the event of foreclosure.

How restrictive is a conservation easement?

A conservation easement generally permits existing land use practices to continue and may allow a limited amount of future development. Each easement is designed to prohibit development and other activities to the degree necessary to protect the significant natural values of that particular property.

Agricultural and forestry activities are permitted and encouraged on most easement-protected land. This includes: building structures such as culverts, bridges, barns, sheds, fences and dams when necessary for farming and forestry. Habitat management and improvement, such as creating ponds and wetlands or establishing plant species to benefit wildlife, is also usually permitted.

Depending on the characteristics of the property and the landowners' wishes, future residential or commercial construction may be prohibited entirely or limited to sites where the impact will not impair the natural values of the property. Additional limitations may include prohibition of mining, excavation, or installation of billboards, and the establishment of protective buffers around ponds or waterways.

How much land must be included?

Any amount. A conservation easement may apply to only a small part or all of an owner's land, depending upon what the owner wants to protect and on whether the restrictions are acceptable to the land trust.

Are there financial benefits to donating a conservation easement?

Income Taxes: The donation of a conservation easement constitutes a charitable gift which may be deductible for federal income tax purposes if the property meets conservation standards established by the federal government. The value of the gift, determined by an appraisal, is equal to the difference between the fair market value of the property before and after the easement is donated.

Estate Taxes: A conservation easement can be a useful estate planning tool, enabling heirs to keep land they would otherwise have to sell. State and federal inheritance taxes on real estate are often so high that the heirs are forced to sell some or all of the land just to pay the taxes. Because an easement reduces the value of the property, the inheritance taxes are also reduced.

Gift Taxes: When a landowner gives land to a family member, the gift is subject to gift taxes if its value exceeds the maximum tax-free amount. Lowering the value of the land through a conservation easement may allow the landowner to give more land free of tax, or may help reduce the amount of tax owed.

Property Taxes: Most property subject to a conservation easement is eligible for preferential tax treatment under current use taxation. Landowners whose property is already enrolled in a current use program will generally not see a further reduction in their property taxes.

How are conservation easements enforced?

The recipient organization (usually a land trust) is responsible for monitoring compliance in perpetuity. Representatives of that organization will visit the property periodically to determine that no violations have occurred. The organization will use written records and photographs to document the condition of the property.

A property owner should make sure that the recipient organization has the time and resources to carry out its monitoring responsibility. Most land trusts maintain endowments for this purpose, and many ask the landowner to make a contribution to the endowment at the time an easement is accepted.

Prepared with the assistance of the Upper Valley Land Trust, which was founded in 1985 with a mission of helping people conserve land. UVLT has worked with farmers and forest owners, local conservationists, and elected officials to conserve nearly 12,000 acres of land since then: productive farmland, working forest, remote wild places, stream and river corridors, scenic vistas, wetlands, hiking trails, and picnic and camping spots. The Upper Valley Land Trust works in 40 Upper Valley towns on both sides of the Connecticut River. For more information about how you can conserve your land, or a special place in your community, call or write:
UVLT, 19 Buck Rd, Hanover, New Hampshire 03755 (603) 643-6626.

APPENDIX I

MT. ASCUTNEY REGION LOCAL RIVER SUBCOMMITTEE MEMBERS

Frank Anthony, Windsor, VT
Lamont Barnet, Rockingham, VT
Jay Boeri, Hartland, VT
Erik Christman, Springfield, VT
Jerry Evarts, Cornish, NH
Tom Fitzgerald, Rockingham, VT
Nancy Franklin, Plainfield
John Hammond, Cornish, NH
◆ Judy Hayward, Windsor, VT
John Leggett, Springfield, VT
◆ Ted Moynihan, Plainfield, NH
Jim Newhaus, Weathersfield, VT
Phil Nothnagle, Hartland, VT
Alan Penfold, Cornish, NH
Ted Putnam, Charlestown,NH
◆ Sharon Quackenbush, Weathersfield, VT
Al Stearns, Charlestown, NH
Bob Stone, Charlestown, NH
Gail Stewart, Rockingham, VT
Steve Sysko, Springfield, VT
Bob Woodman, Claremont, NH
John Yazinski, Claremont, NH

◆ *elected officer of the Mt. Ascutney Region River Subcommittee*