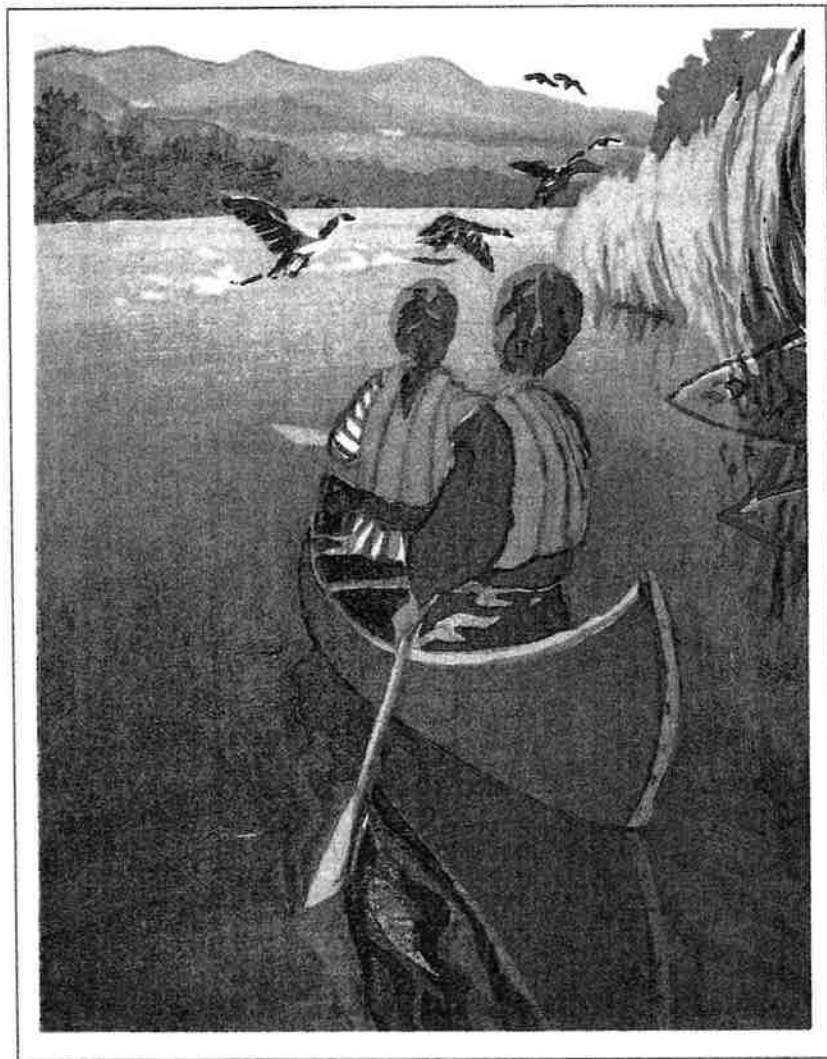


CONNECTICUT RIVER *Corridor Management Plan*



*Volume VI
Wantastiquet Region*

C ONNECTICUT RIVER *Corridor Management Plan*



Volume VI Wantastiquet Region

Prepared by
Wantastiquet Region Local River Advisory Subcommittee
Edited by
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*P*repared for and
dedicated to the Connecticut riverfront towns of:

Chesterfield, Hinsdale, Walpole & Westmoreland,
New Hampshire



Brattleboro, Dummerston, Putney, Vernon & Westminster,
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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*Cover illustration by
Matt Brown of Lyme, New Hampshire*

"Geese Above the Connecticut"

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A BBREVIATIONS

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 RIVER

The Wantastiquet region's plan is a home-grown guide for how all of us -- communities, landowners, businesses, agencies, on both shores -- can recognize and safeguard the Connecticut River. Here is a prime opportunity to demonstrate the strength of local stewardship. This plan was created by citizens who know their town and the Connecticut River, not by state or federal agencies. Gathering together to create this plan for the Wantastiquet segment of the river were representatives from the nine southernmost riverfront towns of New Hampshire and 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 health 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 among the many 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.

Approximately half of this segment is designated by RSA 483 as a *rural river*, half as a *rural-community river*, and several miles in the vicinity of the Bellows Falls and Vernon dams as a *community river* (see page 6.) More information about the NH Rivers Program can be found in Appendix A.

PLAN PARTICIPANTS - the local river subcommittees

To ensure local leadership in implementing the NH 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 up to 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.

"Cooperation and communication between different user groups is the best way to preserve the natural resources and heritage of the valley. Maintaining a viable and non-polluting economy is essential."

*Steve Belczak, Westminster
Co-chair, Wantastiquet
Subcommittee*

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 and other decisions that can affect the river, so that the states can make these decisions with better understanding of local points of view. 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.

Duties of the Local Subcommittees

The strength of the Wantastiquet Subcommittee's planning process lies in the diversity of its membership. These citizens, as directed by RSA 483-A, represent local business, local government, agriculture, recreation, conservation, and riverfront landowners. The subcommittee also includes a member who manages Vernon Station, the major mainstem hydro dam in the Wantastiquet region. Therefore, the group is truly reflective of the region, representing many perspectives from both sides of the river.

Wantastiquet Region River Subcommittee

The Wantastiquet Subcommittee includes the New Hampshire towns of Walpole, Westmoreland, Chesterfield, and Hinsdale, and the Vermont towns of Westminster, Putney, Dummerston, Brattleboro, and Vernon. (see map on p 5).

All of the recommendations of the Wantastiquet Subcommittee's plan represent the consensus of this diverse group of citizens.



PLAN PROCESS

The Wantastiquet 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 to govern the meetings, which have been held at the Westmoreland Town Hall on the fourth Wednesday evening of the month. Meetings are always open to the public. The CRJC Communications Coordinator, who also 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 discussed 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.

The Subcommittee has concentrated its planning upon the 37 miles of the Connecticut River in this segment, and the land adjacent to the river. RSA 483 specifies that the river corridor area to be covered by the plan includes the river and the New Hampshire land area located within a distance of 1,320' (1/4 mile) of the normal high water mark or to the landward extent of the 100 year floodplain as designated by the Federal Emergency Management Agency, whichever distance is greater. While the recommendations of this plan are directed toward this area, the Wantastiquet Subcommittee believes that their consideration on a more general scale and on both sides of the river could benefit the river, its tributaries, and the region as a whole.

Scope of the Plan - the River Corridor

Many of the plan's recommendations are aimed beyond town boundaries, toward state and federal agencies. While the Subcommittee prefers local solutions to local problems, it also recognizes that caring for such a big river is a big job and important public duty, and that help from beyond the watershed is sometimes appropriate. Therefore, this plan is intended to guide these agencies in providing help where it would be most welcome and useful. The Joint Commissions pledge to honor the work of the local river subcommittees by pursuing the state and federal actions they recommend.

A Broader View

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.

ADOPTION OF THE PLAN

It is the goal of the New Hampshire legislature through RSA 483 to empower each New Hampshire Connecticut riverfront community to adopt a locally-designed means of caring for 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.

Each town must choose its own measures to ensure that future development happens in a way that will not harm the river, measures that reflect the character of each town's part of the river and expected land uses. This plan provides a toolkit to help towns and landowners keep the river the valued resource it still is and improve it where possible.

The mechanism for adoption of this plan is the conventional local planning process. Planning boards and commissions can review the plan and adopt it 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 conserving their shared river resource.

Each New Hampshire riverfront town now has the opportunity to adopt appropriate recommendations of this Connecticut River Corridor Management Plan instead of the statewide Comprehensive Shoreland Protection Act (RSA 483-B, see Appendix 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..."

Why adopt the Wantastiquet plan instead of the statewide ordinance? One is custom-built, the other is general. One is the product of discussion among Wantastiquet 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 water in northern New England.

The Wantastiquet 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 in 1989, and also achieved the status of a non-profit organization.

Adopting the local plan instead of the statewide ordinance in NH towns



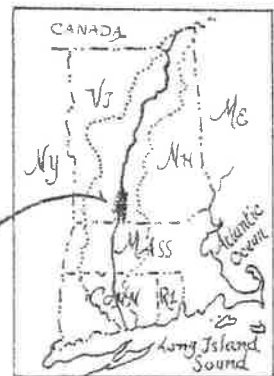
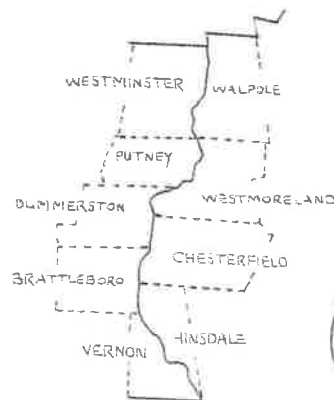


THE WANTASTIQUET REGION

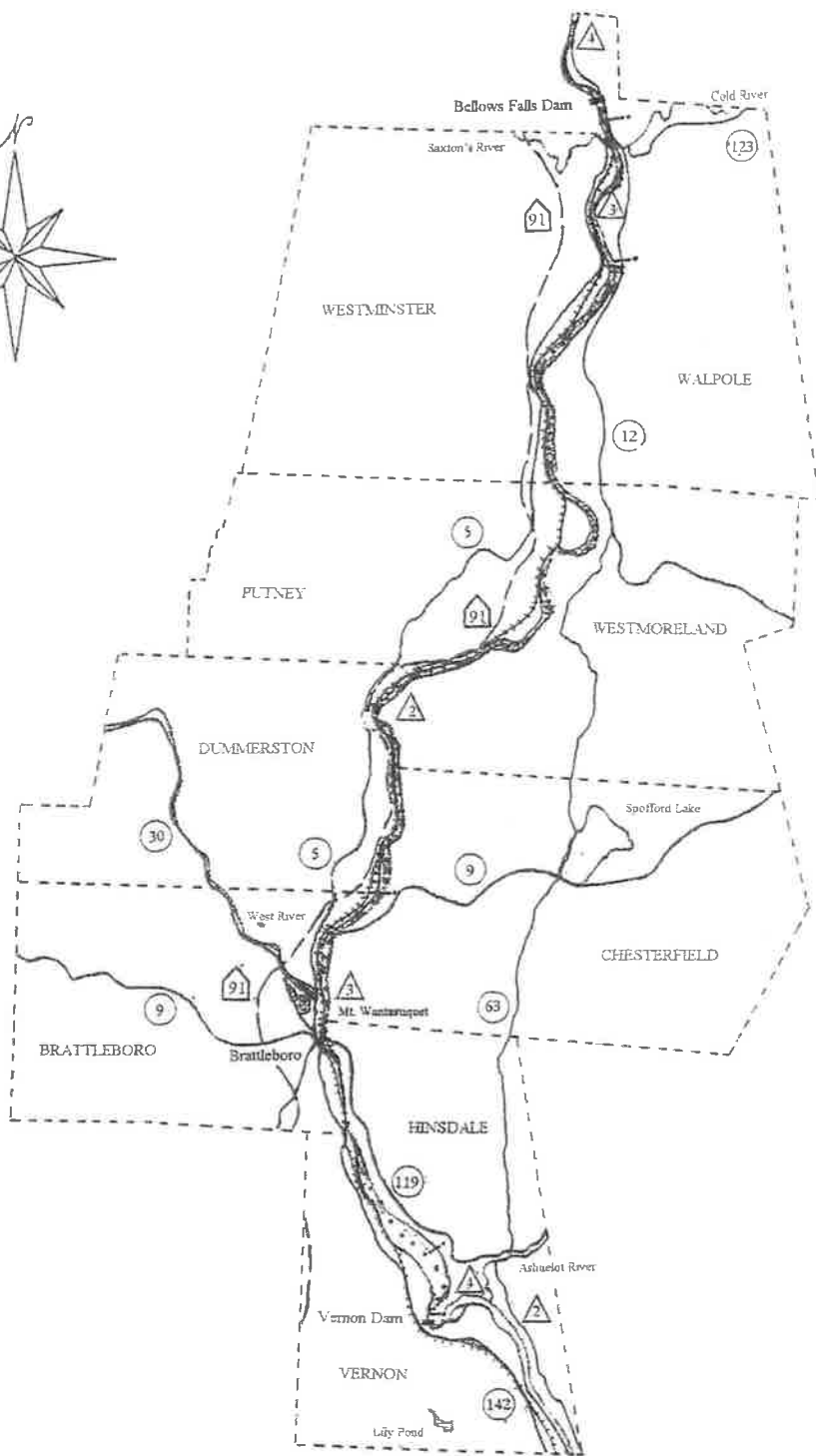
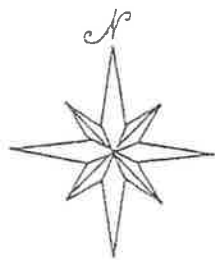
Deep forests, wetlands filled with waterfowl, and the Connecticut River Valley's richest, most productive agricultural lands remain on both sides of the river in a region that nonetheless has seen significant residential and other development. A long history of human occupation continues today as the quality of life offered by the river and its valley appeals to natives and newer residents alike. Towering over the river are Fall Mountain and Wantastiquet Mountain, the landmark chosen by the subcommittee for its name.

Within the river corridor are the town of Brattleboro and nearby clusters of residential, commercial, and industrial development. The Vernon Dam, just downstream from the Vermont Yankee Nuclear Power plant, creates a 26 mile long impoundment on the mainstem with 69 miles of shoreline. The segment is also influenced by the Bellows Falls dam just upstream. Major tributaries to the mainstem in this region are the Saxtons and West rivers in Vermont and the Cold and Ashuelot rivers in New Hampshire.

The Wantastiquet Region River Subcommittee's segment covers 37 miles of the Connecticut River as it runs from the Bellows Falls Dam south to the Massachusetts border. Approximately half of this segment is designated by the New Hampshire Rivers Management and Protection Act as a *rural river*, half as *rural-community river*, and several miles in the vicinity of Bellows Falls and Vernon dams as a *community river*.



Towns of the
Wantastiquet
Subcommittee



WANTASTIQUET REGION

LEGEND

TOWN LINE

WATERS

DAM

BRIDGE

IMPOUNDMENT

INTERSTATE HIGHWAY

STATE HIGHWAY

RAILROAD

NEW HAMPSHIRE RIVERS PROGRAM DESIGNATION

Natural

Rural

Rural Community

Community



SCALE 0 1 2 Miles



WATER QUALITY

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 it is not only possible but enjoyable to swim in the river, where several decades ago, such activity would have been unthinkable. Still, the Wantastiquet region's reach of the river carries nutrients, sediments, debris, and other forms of pollution delivered from upstream and by the tributaries. As the river passes through this most densely populated portion of its upper watershed, it has an opportunity to acquire an even heavier load of pollutants.

A number of small and large wetland areas are connected with the river, including Retreat Meadows at the mouth of the West River in Brattleboro, floodplain forests at the mouth of Sacketts Brook in Putney, and others. Riparian buffers, or filter strips of natural shoreland vegetation, remain in some locations.

There are eight wastewater treatment facilities (WWTF), both municipal and industrial, discharging to the mainstem. The Connecticut River also receives discharges through Catsbane Brook from an industrial facility, and from Keene's and Hinsdale's WWTF through the Ashuelot River.

The Vernon Dam creates the only Connecticut River mainstem impoundment in the Wantastiquet region. Vernon Station does not include a penstock or river bypass, and is required to release a minimum flow of 1250 cubic feet of water per second(cfs) at all times. At Bellows Falls, the river is bypassed for one half mile, and the historic riverbed is almost dry. Below the powerhouse there is a year-round minimum flow requirement of 1083 cfs. The license for these facilities is scheduled for renewal in 2018.

Good water quality is an important economic as well as aesthetic and ecological resource for the Wantastiquet region. Today the river is once again suitable for canoeing, kayaking, 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 Wantastiquet 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 11 registered water withdrawals on the New Hampshire side of the mainstem in this segment.

The Value of Water Quality

Conditions needed to sustain water quality:

- ◆ control of nonpoint pollution from runoff over impervious surfaces, farms, and developments, and from groundwater leaching through landfills
- ◆ separated treatment of sewerage and stormwater
- ◆ adequate river flow to flush pollutants; the "deep gate" design of Vernon Station includes eight 7' x 9' gates at a depth of 52', which helps minimize siltation in the reservoir behind the dam

CURRENT WATER QUALITY PROBLEMS

Significant amounts of organic matter and nutrients are believed to be entering the Wantastiquet reach from streambank soils, agricultural runoff, tributaries, and upstream sources. The slowing of water in the Vernon impoundment may be enhancing the biological uptake of these nutrients and be partially responsible for the algal blooms seen in summer below the dam and in backwater areas, such as the mouth of the West River. Impoundment fluctuations are of concern because they influence water levels of wetlands like Retreat Meadows.

The State of Vermont, based in part upon the results of biological sampling of the riverbottom community, considers that the uses and values of the Wantastiquet river segment that depend upon high quality water are somewhat impaired, due partly to the operation of dams on the river. Additional discharges to the Vernon impoundment, with its reduced capacity for mixing and reoxygenation, could encourage algal growth, depress oxygen levels, and result in reduced water quality in spite of the increased flow from tributaries in the region. The State of New Hampshire conducted chemical sampling at four locations and, through this, identified no water quality problems along the mainstem in this area associated with the impoundments.

While water quality sampling by the State of New Hampshire in 1992 and 1993 found no bacteria violations and concluded that there is no evidence that swimming is unsafe in the Wantastiquet segment, the State of Vermont considers that swimming in the same waters is threatened by nonpoint sources of pollution and is sometimes unappealing due to algal blooms and turbidity. It may not be safe to swim in the mainstem during or shortly after storm events.

The Wantastiquet Subcommittee is concerned about soil and water contamination from old junkyards and landfills located within the floodplain, including the Putney Paper Company discharge from unlined lagoons. Leachate from the recently closed unlined landfill in Brattleboro is entering ground waters, with potential water quality impacts from metals, organics and inorganics. Snow dumping and runoff from impervious surfaces such as parking lots deliver road salt, trash, and oils and grease to the river. These threaten aquatic habitat, public health, recreation, and water supplies.

A 1988 report identified potentially harmful concentrations of chromium and PCBs in fish collected in the Brattleboro area and below the Ashuelot River. Levels were not high enough to warrant a fish consumption advisory at the time.

Streambank erosion and removal of riparian vegetation are important problems in the Wantastiquet region, particularly in North Walpole and on the West and Saxtons rivers. Land development is the primary source of eroded sediments in the West River basin, which delivers them to the Connecticut River. Towns sometimes riprap along banks without consulting state or local conservation commissions. Rock riprap has long been the conventional method of bank stabilization, but it is now understood that this method has a number of disadvantages. Riprap may actually speed up the flow of water, contributing to flooding downstream, and can start new erosion, by deflecting the current against the opposite shore or by creating eddies that erode the adjacent bank. Therefore, an attempt to repair an eroded bank on one property may cause erosion on someone else's property. Riprap also destroys habitat along the bank, and cannot filter pollutants entering the river from runoff as a vegetated riverbank can.

Swimming

Landfills &
Urban Runoff

Bank Erosion &
Sediment

*"You can't win when you
try to fight that river."*

*Westmoreland
riverfront landowner*

Other current problems include:

- ◆ the Keene WWTF on the Ashuelot River may release significant amounts of phosphorus which can cause algal blooms
- ◆ an unidentified source of hydrocarbons in Whetstone Brook
- ◆ uncontrolled and often uninformed use of fertilizers, pesticides, and other toxic materials by homeowners
- ◆ inadequately sized or located culverts; inadequate drainage ditch construction
- ◆ some farms in the region do not have adequate manure storage facilities
- ◆ closed landfills and factories could be contaminating private wells
- ◆ illegal dump one mile north of Herrick's Cove on Route 5
- ◆ while water flow is closely managed by New England Power Company along the mainstem, communications from the U.S. Army Corps of Engineers are not always adequate for coordinating flow from the major tributaries

POTENTIAL WATER QUALITY PROBLEMS

- ◆ inadequate or failed septic systems may allow wastes to pass into groundwater or surface waters
- ◆ conversion of seasonal residences into year-round homes may strain inadequate septic systems
- ◆ potential toxicity of discharge from Hinsdale WWTF, based upon biological sampling of Ashuelot River
- ◆ thermal pollution from discharge of Vermont Yankee Nuclear Power Plant if warmer water is allowed to build up behind Vernon Dam
- ◆ potential contamination from heavy metals in biosolids spread on local agricultural lands
- ◆ addition of hazardous materials to wastewater by homeowners, and subsequent contamination of biosolids
- ◆ potentially inadequate flow to keep pollutants flushed, because of water withdrawals from both the tributaries and the mainstem, and because of minimum flow levels permitted by current dam licenses. Vermont water withdrawals from the mainstem are not registered and may not be adequately included in flow calculations
- ◆ contamination by airborne pollutants including acid rain
- ◆ potential loading of nutrients in waters adjacent to agricultural lands
- ◆ potential contamination from discharge by Boise Cascade north of the Route 9 bridge
- ◆ potential for fuel spills at marinas
- ◆ snowmaking equipment is a potential source of oil contamination in Vermont tributaries
- ◆ chlorinated wastewater sprayed upon ski slopes may have an impact upon vegetation which is critical to preventing erosion

OBJECTIVES

- ◆ Improve the balance of compatible uses of the land without impacting the river.
- ◆ Minimize the impact of forestry and agricultural practices on the river while preserving these uses of the land.
- ◆ Discourage polluting industrial uses. While the focus of this plan is the mainstem of the Connecticut River, the Wantastiquet Subcommittee recognizes that the river's tributaries have a significant influence because the quality and quantity of water delivered by the tributaries directly affects the mainstem.

Pursue action planning: identify groups, mechanisms, individuals to implement conservation, mitigation, restoration, and protection plans.

FEDERAL GOVERNMENT

U.S. Environmental Protection Agency *should:*

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

U.S. Army Corps of Engineers *should:*

- ◆ communicate more effectively with New England Power Company and its successors about releases from flood control dams for better flow management in the Connecticut River

USDA Cooperative Extension Service *should:*

- ◆ educate homeowners about the wise use and disposal of fertilizers, pesticides, and toxic materials
- ◆ provide information to builders and landowners about composting toilets
- ◆ work with farmers to encourage use of best management practices and develop nutrient management plans

USDA Natural Resources Conservation Service *should:*

- ◆ ensure that all farms in the region have adequate manure storage and are making the optimum use of nutrients
- ◆ work with farmers to allow them to make best use of the Environmental Quality Incentives Program of the 1996 Farm Bill
- ◆ cooperate with Agway on implementation of research into satellite-based evaluation of soil fertility

Federal Emergency Management Agency *should:*

- ◆ advise towns on potential technical and financial assistance to help them identify potential flood and erosion hazards and rectify these to avoid future washouts and expensive road and culvert repairs
- ◆ work with towns to ensure accuracy of floodplain and special flood hazard maps

Federal Energy Regulatory Commission *should:*

- ◆ encourage citizen participation in dam relicensing
- ◆ fund state and federal resource agencies to review the water quality effects of dams on the Connecticut River and its tributaries to balance the hydropower generation use with water quality uses and values
- ◆ require site specific studies by the licensees at both the Vernon impoundment and downstream from the dam

STATE GOVERNMENT

Water Quality agencies *should:*

- ◆ educate public on permitting process to avoid unpermitted actions that could impact water quality
- ◆ take active role in educating people to promote riverbank stability
- ◆ favor vegetative and other less intrusive means of bank stabilization; use riprap as a last resort
- ◆ encourage development and maintenance of streamside buffers
- ◆ work with citizen monitoring groups, New England Power Company and its successors, and watershed associations to survey bank erosion and study river siltation
- ◆ protect groundwater recharge areas; distribute accurate maps of aquifers and aquifer recharge areas to the towns as soon as they are available

- ◆ direct Clean Water Act funding to improve the landfill cap and collect and treat leachate at Brattleboro landfill
- ◆ continue and increase water quality monitoring; New Hampshire should consider including biological monitoring
- ◆ revisit water quality classification system
- ◆ study proposed additional discharges for the river, examining the specific area to see if it can assimilate the additional waste load and still meet the water quality standards of **both** Vermont and New Hampshire
- ◆ study further the impact of dams on water quality, look closely during dam relicensing at whether the historic low flow is an adequate minimum flow requirement
- ◆ invite communication with New England Power Company and its successors
- ◆ consider user fees for consumptive water withdrawals over a threshold which will not impact small users but which will encourage water conservation by larger users
- ◆ encourage riverfront homeowners to plant or retain buffers of natural vegetation along the riverbank
- ◆ encourage the use of vegetative bank stabilization techniques, in combination with riprap where necessary, to control erosion and sedimentation
- ◆ educate town road agents about best management practices (BMPs) for road, ditch, and culvert maintenance to save the town money and to prevent siltation
- ◆ ensure responsible disposal or application of biosolids
- ◆ Vermont continue bracketed water quality monitoring to discover source of hydrocarbons in Whetstone Brook; check fishery in this brook to see if trout populations have recovered following chlorine spill from swimming pool
- ◆ New Hampshire monitor water quality above and below Hinsdale WWTP for toxicity
- ◆ Vermont conduct similar tests in Sackett's Brook
- ◆ Vermont investigate illegal dump one mile north of Herrick's Cove on Route 5 and the quality of a discharge from Boise Cascade just upstream from the Route 9 bridge
- ◆ New Hampshire adequately fund supervision of new regulations for biosolid application

TOWNS *should*:

- ◆ preserve agricultural uses and forest lands along the river
- ◆ discourage polluting industrial uses
- ◆ ensure that riverside construction activities do not impact riverbanks and buffers
- ◆ consider not allowing building in the floodplain, to retain flood storage area, reduce pollution, protect private property, and save tax dollars in disaster relief
- ◆ reduce nonpoint pollution from urban runoff, landfills, industrial and municipal sources, and agricultural runoff
- ◆ consider ways of reducing runoff given the water quality impacts of impervious surfaces
- ◆ raise funds locally to support citizen water quality monitoring; encourage water quality monitoring by schools and the Abenaki Riverkeepers program
- ◆ ensure that town road agents use BMPs for road, ditch, and culvert maintenance to save the town money and to prevent siltation
- ◆ follow BMPs for applying salt to roads, and consider limited salt areas near waterways
- ◆ consider asking developers to follow BMPs for erosion and sedimentation control
- ◆ consider adopting an ordinance on biosolid application

- ◆ hold hazardous waste collection days
- ◆ consider a wellhead protection program such as Hinsdale's to save money in sampling costs; provide information on wellhead protection to new property owners

Landowners *should*:

- ◆ minimize negative impacts from forestry and agricultural practices on the river
- ◆ preserve agricultural uses and forest lands along the river
- ◆ learn about the wise use and disposal of fertilizers, pesticides, and toxic materials
- ◆ plant or retain buffers of natural vegetation along the riverbank for privacy, to keep pollutants from entering the river, to provide wildlife habitat, and to help stabilize the bank
- ◆ select vegetative stabilization methods or where appropriate, vegetative methods in combination with a rock toe to slow serious erosion problems that threaten structures
- ◆ Recognize that people cannot stop erosion, they can only speed it up or slow it down
- ◆ know location of and regularly maintain on-site septic systems
- ◆ consider use of composting toilets
- ◆ refrain from using fertilizer within 250' of the river

Farmers *should*:

- ◆ use best management practices to reduce nonpoint source pollution
- ◆ work with conservation districts and Cooperative Extension Service to prepare total nutrient management plan for farms, to make best use of available nutrients and reduce potential for water contamination from on-farm pollutants and from biosolid application
- ◆ consider participating in the Environmental Quality Incentives Program of the 1996 Farm Bill

Citizens and local citizen groups *should*:

- ◆ participate in relicensing process for local dams
- ◆ encourage water quality monitoring by schools and the Bonnyvale Environmental Education Center
- ◆ Ashuelot River local advisory committee should look into the efficiency of the Keene WWTF
- ◆ work with governmental agencies, New England Power Company and its successors, landowners, and watershed associations to survey streambank erosion and siltation in the Wantastiquet region
- ◆ nominate the Cold River into the NH Rivers Management and Protection Program to permit citizen-based planning and inquiry into the quality and future of this major tributary to the Connecticut River, as is now happening along the Ashuelot River
- ◆ Vermont citizens should consider a similar approach for the West River through Vermont's Outstanding Resource Waters program



REFERENCES

Connecticut River Water Quality Assessment, NH Dept. of Environmental Services and VT Dept. of Environmental Conservation, 1994. Prepared for the CRJC with support from the Environmental Protection Agency, 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 the Wantastiquet 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? Do 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.



MAPS

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. (NOTE: These same maps are presented in Along the Northern Connecticut River: An Inventory of Significant Instream Features at a scale of 1:63,360.)

Wantastiquet 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 Walpole/Westminster through Hinsdale/Vernon. Scale 1:31,680

Wantastiquet 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 in the towns of Walpole/Westminster through Hinsdale/Vernon. Scale 1:31,680



FISHERIES & AQUATIC HABITAT

The 2550 acre reservoir created by Vernon Dam, which extends upstream nearly to the Bellows Falls Dam, has diversified the types of habitat available for fish, and created a warm water fishery throughout this section of the river. Here, studies of the aquatic macroinvertebrates which provide food for fish rate the quality of the riverbottom community as fair. The types and quantities of organisms indicate a habitat that is moderately enriched with organics and nutrients, and the riverbottom was more than 50% embedded with sand when studied in 1992-3. Blue-green algae, commonly found below wastewater treatment plants, rule among plants growing on the river bottom.

Below Vernon Dam, the aquatic macroinvertebrate community is rated as poor, and highly dominated by a single species of pollution-tolerant caddisfly. However, the presence of stoneflies just below the Bellows Falls dam may indicate a higher quality macroinvertebrate community in this area of faster water.

Anglers pursue their sport from numerous points on shore at official access points, from boats, and wherever the railroad or highways allow them to easily access the river. Popular fishing spots are below the Bellows Falls and Vernon Dams, throughout the Westmoreland-Chesterfield section, at the mouth of the West River in downtown Brattleboro, and the bays and setbacks above the Vernon Dam. Fish are generally larger in the impoundment than below the dam.

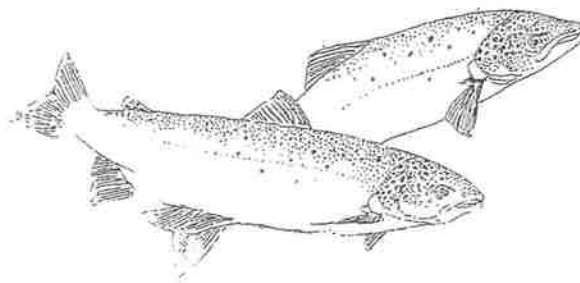
While the focus of this plan is the mainstem of the Connecticut River, the Wantastiquet Subcommittee recognizes that the tributaries provide key spawning and nursery areas for its fisheries, and that the quality and quantity of water delivered by the tributaries directly affects fisheries in the mainstem. Therefore, the Subcommittee has chosen to address several issues in the tributaries.

The Atlantic salmon, which has been the target of an ambitious restoration program, now migrates into this segment of the river. Of the fish which are not captured for the program at Holyoke, MA, between 5 and 13 adults return and pass up the fishway at Vernon Dam each year. The U.S. Fish and Wildlife Service has identified waters in the Wantastiquet region as special focus areas for the Conte National Fish and Wildlife Refuge, including the Cold River, which provides nursery and rearing habitat for juvenile Atlantic salmon, and the West River, including its Rock and Winhall tributaries and Wardsboro Brook. These waters now provide spawning areas for blueback herring and could provide salmon spawning habitat. It is also an important river system for the dwarf wedge mussel.

Life Today Beneath the Surface

Tributaries

Atlantic Salmon



The American shad population has developed dramatically in recent years, with thousands of fish passing through the fish ladder at Vernon Dam. A fishery for this species, which was never completely lost from the Connecticut River, has developed below the dam. Shad historically did not travel further upstream than Bellows Falls. The Ashuelot River to Surry Mt. Dam, including tributaries below the first dam, provides important spawning habitat for American shad and American eels.

American Shad

Brook trout are the only native trout in the Connecticut River, and are an indicator of cold, well oxygenated water. The mainstem no longer offers good brook trout habitat. The brown trout population is adequate. New Hampshire stocks rainbow trout in the mainstem, and there is a naturally reproducing population that migrates into larger tributaries but reproduces there only in smaller, less acidic waters such as those of East Putney Brook, Canoe Brook, Salmon Brook, and also the Saxton's River in Vermont. In New Hampshire, rainbow trout spawn in the Cold and Little Sugar rivers.

Trout

Tournament fishermen have ranked the Connecticut River as the fourth most important waterbody in New Hampshire for tournament activity. Twenty-five tournaments were held on the river in 1994. Walleye is a favorite sport fish, and the Connecticut River population, one of the few in this part of New England, is an important draw for tourist/fishermen. Yellow perch is the number one sport fish in Vermont, and is fished here through the ice on river setbacks. A record pike was caught near Sprague Brook.

Tournament Fishing

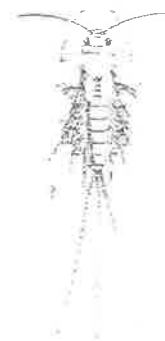
CONDITIONS NEEDED TO SUSTAIN FISHERIES

& The Aquatic Community Upon Which They Depend

- ◆ River setbacks and wetlands offer an important nursery for warmwater fish.
- ◆ Streambank buffers 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, and by shading the water and moderating water temperature increases. In general, the deeper the buffer the more effectively it traps nutrients and sediment.
- ◆ Public support is needed to continue the salmon restoration effort. Atlantic salmon fry are being stocked in tributaries, although smolts are no longer being stocked.
- ◆ Water temperatures must remain cool enough for an adequate time period to permit the fish to travel to spawning areas.
- ◆ Fish passage for spring spawning fish is now available both upstream and downstream at Vernon Dam. Some 25% of smolts still choose to travel downstream through the open gates or turbines; their survival rate there is 95%.
- ◆ Water level fluctuations in the impoundments must effectively coordinate with critical fish spawning times.

POTENTIAL IMPROVEMENTS

- ◆ possible rainbow trout fishery below Bellows Falls in the proximity of Saxtons River, also in the Cold River
- ◆ viable Atlantic salmon and American shad populations throughout segment
- ◆ better fish passage into smaller tributaries is possible through properly located and designed culverts



CURRENT PROBLEMS

- ◆ Life below the surface in this section of the Connecticut River is losing its diversity due to the modification of flow and the very few types of food available to aquatic life.
- ◆ Potentially harmful concentrations of chromium have been found in fish caught in the Brattleboro area and below the Ashuelot River. PCBs were also elevated, although not high enough to warrant a fish consumption advisory when the report was prepared in 1994. New Hampshire has since issued a statewide advisory based on potential mercury levels.
- ◆ Establishment of a viable Atlantic salmon population is difficult, particularly because the native strain was extirpated and fish from other watersheds are being employed in the reintroduction effort. Water temperatures increase more rapidly in impounded areas of the river than they did historically, compressing the time during which salmon can travel through them to spawn.
- ◆ Erosion on tributaries affects spawning habitat, particularly for trout.
- ◆ Streamside buffers are missing or threatened in some areas due to development along the riverbank.
- ◆ Uncontrolled releases of sediment from Ball Mountain Reservoir in Jamaica, Vermont smothered three miles of riverbottom habitat in the West River during the summer of 1993. Another release occurred in August, 1995.

POTENTIAL PROBLEMS

- ◆ Water quantity in winter may become an increasing problem, especially on the tributaries used for spawning, due to withdrawals for snowmaking at ski areas within the watershed.
- ◆ Dam malfunctions such as recently occurred on the West River can release tons of sediment, obliterating downstream fish spawning areas.
- ◆ 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.
- ◆ 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, contractors, and fish/wildlife agencies. Pool changes are now much less at Vernon since flashboards are no longer used, and panels recently installed at Bellows Falls will have a similar effect.
- ◆ Winter drawdown of water levels can lead to decreased species diversity and allows anchor ice to form, which can remove entire sections of riverbottom in spring, threatening fish spawning areas. Winter drawdown has not been practiced at either the Vernon or Bellows Falls dams since approximately 1985.



OBJECTIVES

The Wantastiquet 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.



FEDERAL GOVERNMENT

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

- ◆ facilitate cooperation among ski areas, landowners, and the public for the benefit of fisheries
- ◆ protect fish habitat through protection of streambank buffers and other water quality improvements
- ◆ consult with dam operators in scheduling of major drawdowns and releases to avoid impacts upon fish migration and reproduction
- ◆ continue its efforts to restore the Atlantic salmon and American shad to this segment of the Connecticut River basin

Federal Energy Regulatory Commission *should:*

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

U.S. Army Corps of Engineers *should:*

- ◆ avoid sudden major releases from flood control dams that allow heavy sediment loads to pass from impoundments

STATE GOVERNMENT

Fish and Game/Wildlife agencies *should:*

- ◆ continue or enhance cooperation between the states, particularly in enforcement
- ◆ collect fish population data for this reach of the river, through creel surveys and direct census-taking; seek information from area sportsmen's clubs and bass tournament fishermen
- ◆ conduct fish and macroinvertebrate community studies to determine the impact of flow regulation, if any, and whether habitat has been lost due to erosion and sedimentation
- ◆ make information available to the public at access points
- ◆ maintain close communication with dam operators to schedule drawdowns and releases to avoid impacts to fish migration and reproduction

Water Quality agencies *should:*

- ◆ continue testing of fish tissues for heavy metals and other toxics
- ◆ control nonpoint and point source pollution of aquatic habitat in both the mainstem and tributaries
- ◆ New Hampshire should complete development of instream flow rules for the Connecticut River; rules should address how dam operators should handle drawdowns for repairs; review power generation and river flow procedures to allow optimal releases during high flow events during fish migration and reproduction
- ◆ examine impacts on water flows, particularly during late winter and early spring, on tributaries used as spawning waters
- ◆ follow the U.S. Fish and Wildlife Service's recommendation for use of the median February flow as a minimum stream flow to maintain winter habitat
- ◆ install stream gauges near ski area withdrawal points to accurately determine flow
- ◆ ask ski areas to investigate alternative methods of water storage for snowmaking rather than direct withdrawal from streams
- ◆ recommend recycling of fluorescent light bulbs to reduce the potential for release of mercury into the environment

TOWNS should:

- ◆ control nonpoint and point source pollution of aquatic habitat
- ◆ support use of BMPs for forestry, agriculture, road maintenance, and construction as a means of limiting nutrient and sediment runoff into waterways and protecting streambank buffers
- ◆ check culverts to be certain that they are located at the proper elevation to allow passage of fish; add low profile bars within steeper, larger culverts where appropriate to create small pools for easier passage

Dam operators should:

- ◆ communicate closely with state and federal fish and game/wildlife agencies to schedule dam repairs, drawdowns, and releases in order to avoid impacts upon fish migration and reproduction; local experts should also be asked to cooperate to provide an opportunity for a consensus opinion
- ◆ cooperate with one another to manage flow effectively and avoid sudden releases of sediment
- ◆ power company biologists and consultants for Vermont Yankee should continue to provide, improve, and monitor anadromous fish passage both up and downstream. These facilities have compiled the most comprehensive database on area fisheries, in the area of Vernon dam from the late 1960's to the present, as a requirement of their discharge permit. Bass, walleye, and yellow and white perch are monitored for age and growth; others are monitored for relative abundance. These studies should continue.

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

*"Keeping a buffer along
the river is the best thing
you can do for those fish."
Westminster fisherman.*

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 its consumption of fish from the river as warranted by test results.
- ◆ participate in the dam relicensing process

REFERENCES

◆
Connecticut River Water Quality Assessment, New Hampshire Department of Environmental Services and Vermont Department of Environmental Conservation, 1994.

MAPS

◆
GIS maps produced for the CRJC and local river subcommittees in 1994 by the GIS Planning Office of 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.



SHORELAND & UPLAND HABITAT

A rich variety of habitat types is concentrated in the area immediately adjacent to the river, from the wetlands and setbacks associated with the river's edge, to the fertile floodplain and remnants of its forest, to the ledge uplands of Wantastiquet and Fall mountains.

The river functions as a corridor for neo-tropical migrant birds and other species which take advantage of the slightly milder conditions in riparian areas before passing into upland habitat as spring proceeds. The mainstem from North Westminster south to the confluence of East Putney Brook provides critical spring stopover habitat for waterfowl and shorebirds, including hundreds of black ducks at a time. 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.

Migration Corridor

The Connecticut River near the Vernon Dam is particularly important for waterfowl, and is considered by biologists to be the only waterfowl wintering site on the northern half of the river. It is also another important stopover site for hundreds and sometimes thousands of waterfowl during migration; 300-400 black ducks, 150-200 common goldeneyes, and 500 Canada geese have been observed at a time, along with pied-billed grebe, hooded mergansers, and bufflehead. From Norman's Auto to the Vernon Dam, the shoreline is wooded up to the railroad tracks, providing good wildlife habitat. Dunshee Island, located at mile 32 south of the bridge in Walpole, has recently been acquired by New Hampshire Fish and Game Department.

Waterfowl

Osprey and eagle use is increasing, and eagles are seen both at the Vernon Dam, where open water in winter affords good fishing, and at the Westminster - Walpole Bridge. Bluebirds have been observed wintering in Walpole along the abandoned railroad line south of this bridge, and also in Hinsdale. Osprey are seen at Great Meadows and Putney Meadows. They may also nest on or near the high tension wires at Hinsdale.

Osprey & Bald Eagles

Wetlands associated with setbacks such as Broad Brook in Vernon offer highly productive habitat, and also function to reduce the effects of flooding and filter pollutants. In the Wantastiquet region, these wetlands are largely limited to the Hinsdale, Brattleboro, and Vernon shores, but the outlets of Mill Brook in Westmoreland and Catsbane Brook in Chesterfield also offer good habitat for wildlife.

Wetlands

Wetland habitats are necessary for the survival of a disproportionately high percentage of threatened species in the Wantastiquet region. A particularly significant area of wetland habitat occurs at the mouth of the West River in Brattleboro in a 55 acre marsh known as Retreat Meadows, which is owned by the Brattleboro Retreat. It serves as important stopover habitat for migrating wood and black ducks, mallards, hooded mergansers, tundra swan, Canada geese, and a variety and abundance of shorebirds. The Conte National Fish and Wildlife Refuge Plan has identified Retreat Meadows as one of its special focus areas along the Connecticut River.

Surrounding Wantastiquet Mountain in Chesterfield and Hinsdale, New Hampshire are 6,600 acres of forested mountainous habitat with extensive rock outcrops and talus slopes. Four rare plant and animal species have been recorded at this site, a second special focus area identified by the Conte National Fish and Wildlife Refuge Plan. A total of 907 acres on Wantastiquet

Forest Habitat

Mountain are protected here, partly as state forest (approx. 300 acres) and partly by the Society for Protection of New Hampshire Forests and The Nature Conservancy. This large block of forest provides important breeding habitat for forest interior migrant landbirds, and is contiguous with 13,000 protected acres of habitat in Mt. Pisgah State Park.

The Fall Mountain area includes extensive deer yards, three marshes, and nesting habitat for turkey vultures. A significant stand of white oak and other nut-bearing trees offers good mast here, and this area is much appreciated by hunters. Deer yards have been mapped in the region by the New Hampshire Fish and Game Department: Walpole has 24, Westmoreland 23, Chesterfield 21, and Hinsdale 7. There is at least one deer yard in each town within close proximity to the river.

Abandoned railroad corridors offer excellent habitat for game birds and for the increasingly rare New England cottontail rabbit. Very well-drained soils on the raised rail beds, which are kept clear of woody vegetation, offer one of this species' last refuges along the Connecticut River in New Hampshire, along with the edges of riverfront farm fields. The New Hampshire Fish and Game Department considers that public use of rail corridors for trails would not conflict with their habitat value for rabbits. A public wildlife management area encompassing 30 acres north of the Westminster Bridge is good habitat for the cottontail rabbits; there is also a population in Hinsdale and two in Walpole, one of them at the confluence of the Cold and Connecticut Rivers. This species was recently recognized as separate from populations west of the Hudson River.

New England Cottontails

Riverfront farms are now considered particularly significant resources for some species of wildlife. The largest populations of wild turkeys are concentrated here, where most nest within 100' of pastures. Turkeys forage during the winter on crop residues left in fields. Geese are now beginning to nest in the river valley. Migrating geese largely from New Brunswick and Nova Scotia, of which flocks numbering 400-500 birds have been observed, use fields kept open by farms on River Road in Putney, particularly at Great Meadows, where the birds sometimes stay longer after manure is spread in liquid condition. The best sites for pheasant are also located on riverfront farms. Area farmers note that in recent years the increasing population of coyotes has sharply reduced woodchuck populations here.

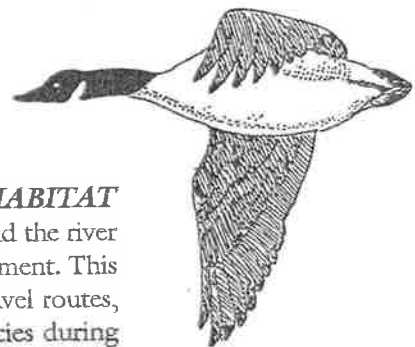
Riverfront Farms

CONDITIONS NEEDED TO SUSTAIN GOOD HABITAT

Buffers of native vegetation between upland areas and wetlands, streams, and the river are important to protect these habitats from sedimentation and other effects of development. This transition zone between the river and nearby uplands provides food, cover, and travel routes, roosting sites, nesting sites, and denning sites, and is also a refuge to wildlife species during highwater events. The buffer should be sufficient to permit wildlife to avoid using its edge, where they may be more vulnerable to predators such as raccoons and domestic cats and dogs.

New England cottontail rabbits require very well-drained soil that has dense understory vegetation but is free of encroachment by woody species. Such habitats include wetlands, forest edges, and portions of forest where trees have been cleared or killed by natural disturbances. Also important are:

- ◆ riverfront farms and the open space they provide for certain kinds of wildlife, most notably game birds, because of the mixed habitat of open fields, fencerows, and wooded land



- ◆ corridors for travel between pockets of suitable habitat
- ◆ water elevations adequate to keep significant wetlands flooded
- ◆ wetlands affected by minimal outside disturbance, to provide wildlife and fisheries habitat, protect water quality, provide flood control, stabilize the shoreline, and filter pollutants
- ◆ high water quality for otter, mink, fish, and other aquatic wildlife
- ◆ pheasant require stocking, as is now done in Walpole and Westmoreland by New Hampshire Fish and Game Dept.

POTENTIAL IMPROVEMENTS IN HABITAT

- ◆ osprey nesting at Putney Meadows could be encouraged by addition of a nesting platform
- ◆ more goose nesting at farm ponds
- ◆ increased habitat for nesting birds
- ◆ new recreational trail corridor easements could function as potential connections in habitat for some species
- ◆ plantings of millet, corn, and fruiting shrubs near the river can provide valuable turkey and deer forage. Allowing some standing corn to remain in the fields offers a significant boost to foraging wildlife, especially turkeys which may depend upon this source of food during particularly harsh winters. Farmers could use assistance to plant forage crops for wildlife on land they no longer use, allowing them to justify keeping this land and keeping it open. There could be recreation benefits to this arrangement.



CURRENT PROBLEMS

- ◆ areas of suitable habitat are becoming fragmented, preventing dispersal of wildlife
- ◆ local decline of dairy farms, which are particularly vulnerable to development, can lead to reduction of the wildlife habitat they provide
- ◆ floodplain forests, of which only remnants remain, are now altered by flow regulation; where they were once regularly inundated, they are now only rarely inundated
- ◆ Class III wetlands do not appear on National Wetland Inventory maps, as do Class I and II wetlands, and are largely unprotected
- ◆ vegetation of the islands in the river needs better understanding
- ◆ New England cottontail rabbit distribution in Vermont is poorly understood
- ◆ current funding inadequacies in state Natural Heritage Inventory programs
- ◆ invasive exotic species such as purple loosestrife and *Phragmites* (giant reed) displace native plants which offer better food or cover for wildlife
- ◆ beaver activity along the riverbank is exacerbating bank erosion by cutting trees on the bank and creating slides which channel runoff and initiate erosion
- ◆ nonpoint pollution, habitat loss, erosion, and wetlands loss are all problems to some degree, although they are not yet well measured

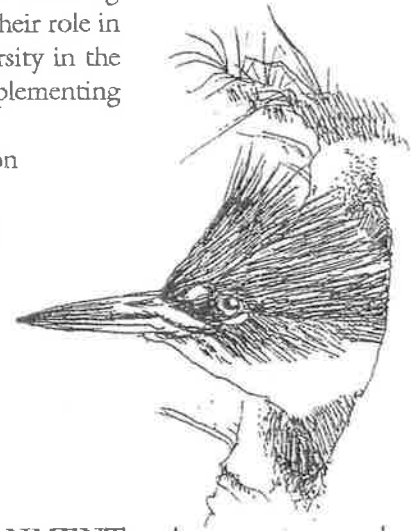
POTENTIAL PROBLEMS

- ◆ habitat fragmentation and loss through residential development
- ◆ loss of deer yards
- ◆ imported conditions such as acid rain, hemlock woolly adelgid, and gypsy moth can alter forest cover, especially of deer yards and mast-producing plants
- ◆ disturbance of wildlife by domestic cats and dogs
- ◆ introduction of zebra mussel

OBJECTIVES

The Wantastiquet Subcommittee values the diversity of wildlife in this region, particularly that associated with the Connecticut River and its rich bottomlands. Observation of wildlife is an important form of recreation here, and many people also enjoy photographing or hunting wildlife. The Subcommittee also recognizes the importance of insect-eating birds for their role in protecting forests from insect pest outbreaks. This plan seeks to maintain biodiversity in the Wantastiquet region and to balance multiple uses with wildlife requirements. In implementing this plan, consider that:

- ◆ the approach should be oriented toward conservation rather than strict preservation
- ◆ the entire impact of the loss of a species cannot be completely understood
- ◆ all taxpayers should help bear the burden of protecting endangered species habitat



FEDERAL GOVERNMENT U.S. Fish and Wildlife *should:*

- ◆ educate valley residents and communities about the habitat needs of wildlife and effects of human activity
- ◆ evaluate and update current natural heritage inventory lists, and note populations which may be naturally low because they are located on the fringe of their species' natural range
- ◆ make information available to landowners on habitat stewardship
- ◆ use incentive programs for landowners for good habitat stewardship
- ◆ support funding of Natural Heritage Inventory programs in the states
- ◆ continue to study the role of the Connecticut River and its tributaries as a migration corridor for birds, and how they use this riparian habitat
- ◆ work with Vermont Dept. of Fish and Wildlife and local organizations to protect Retreat Meadows through a cost share challenge grant for conservation easements or fee title acquisition
- ◆ work with partners such as the state agencies and local organizations to protect Wantastiquet Mountain through cost share challenge grants for conservation easements and fee title acquisition
- ◆ conduct workshops for boat owners and others about zebra mussel and the possible impacts of infestation
- ◆ conduct research on the impact of various actions upon species and the environment
- ◆ prioritize species for protection in terms of their relative danger from encroachment

STATE GOVERNMENT *should:*

- ◆ State of NH should retain ownership of the railroad rights of way
- ◆ retain current use legislation and strengthen it in Vermont

Fish and Game/Wildlife agencies *should:*

- ◆ help establish connections between remnant floodplain forests and other riparian habitats
- ◆ protect wetlands for their role as highly productive wildlife habitat, natural filter for pollutants, flood control, open space, aesthetics, and recreation

R E C O M M E N D A T I O N S

- ◆ encourage establishment of riparian buffers both to filter sediment and other pollutants from entering the river and its tributaries, and to provide riparian wildlife habitat
- ◆ encourage inventory of riparian wildlife populations
- ◆ inventory vegetation growing on the islands
- ◆ help maintain the economic viability of riverfront farms
- ◆ work with farmers to help integrate seasonal and year-round wildlife habitat needs with farm activity; look at both where and when farm work is done to avoid conflict with wildlife
- ◆ lease or purchase development rights from willing landowners on privately-owned riverfront farms
- ◆ establish wildlife food blocks at the Cheshire County Farm
- ◆ investigate the status of New England cottontail rabbits
- ◆ work with New Hampshire Dept. of Transportation in managing abandoned railroad beds for New England cottontail rabbits
- ◆ set up osprey nesting platform at Great Meadows and islands
- ◆ work with New England Power Company and its successors to install osprey nesting platforms and to manage for rabbit cover when clearing under its power lines
- ◆ provide nest boxes for kestrels, screech and saw whet owls, wood ducks, and hooded mergansers
- ◆ discourage gardeners from planting purple loosestrife

TOWNS *should:*

- ◆ encourage cluster development to allow minimal impact upon riparian habitat and to require/allow development or expansion of buffers
- ◆ help maintain the economic viability of riverfront farms
- ◆ reduce taxes if the utility of the land is limited by the presence of endangered species
- ◆ ask local conservation commissions to review sites under scrutiny in subdivision approval process for species and habitats of concern, with the understanding that they can request additional information
- ◆ conservation commissions should identify the Class III wetlands in their towns. This could be accomplished for riparian wetlands by floating down the river, checking observations against orthophotos, and comparing results with current town regulations to determine which wetlands are already protected.

LANDOWNERS *should:*

- ◆ follow current laws
- ◆ monitor beaver activity along the riverbank
- ◆ monitor riverfront wetlands for exotics
- ◆ retain or establish buffers of native vegetation along the river to provide habitat for resident and migrating wildlife
- ◆ plant millet, corn, winter rye, and fruiting shrubs near the river to provide forage for wild turkeys
- ◆ establish permanent communication and cooperation with the U.S. Fish and Wildlife Service through the Conte Refuge

**NEW ENGLAND POWER COMPANY
and its successors *should:***

- ◆ recognize wildlife habitat value of its extensive riverfront lands, and manage them appropriately in cooperation with state fish and game/wildlife agencies

REFERENCES

Silvio Conte National Fish and Wildlife Refuge Final Action Plan and Environmental Impact Statement, US 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.



MAPS

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

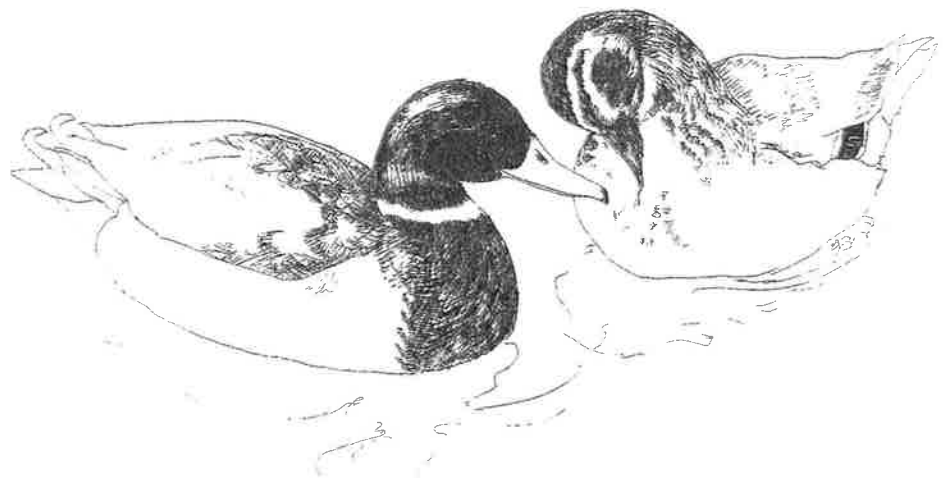
Communities, Wantastiquet Region. Map showing the general location of unidentified biological communities of concern and their rarity within the watershed, in all the watershed towns in the LRS region. Accompanied by descriptive listing of these communities and their rarity rank on a state, watershed,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

Plants, Wantastiquet 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, Wantastiquet 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.





RECREATION

ON AND ALONG THE CONNECTICUT RIVER

The river and its corridor offer many kinds of recreational opportunities in the Wantastiquet region, including swimming, scuba diving, boating, and waterskiing. Natural beaches along the river, particularly at mile 23 1/3 and mile 26 on the Vermont side, are popular for swimming, as are Stebbins Island and a site near the Vermont Yankee plant. Scuba divers enjoy exploring the river around the bridges. Putney residents enjoy swimming and camping along the river in the southern part of their town. (*Note: Distances are measured in miles from the Massachusetts border.*)

Navigability of the river by a variety of boats, including canoes, rowboats, jetskis, kayaks, and small and large power boats, is a valued aspect of recreation on this segment. Most of the boating activity takes place below Walpole. Canoes and rowboats use the entire length of the segment and can take advantage of back inlets. Sailing is somewhat limited as much of the river is sheltered from the wind. Few power boats travel north of Westmoreland. There is presently a marina at the mouth of the West River in Brattleboro and another major new marina in Hinsdale. The Belle of Brattleboro operates scenic cruises, and the Brattleboro marina is occasionally the site of an unofficial steamboat regatta. Jetskis are commonly used in the section of the river from Chesterfield south to the Vernon Dam.

There are 13 boat launches available to the public in this segment:

Walpole: Pine Street site, owned by NEP, dredged in 1996; mile 39 Sandy Beach site, cartop access only, gravel ramp, owned by NEP; mile 37.38

Putney: Putney state launch, owned by State of VT, paved ramp; mile 24.9

Dummerston: State of VT, mile 20.43; another access at mile 15.42

Chesterfield: Access at mile 17.15, River Road, and at mile 15

Brattleboro: West River Marina, paved ramp; mile 15.46. Access at mile 13.13

Hinsdale: Hinsdale Island; marina; gravel ramp; mile 11.97. Access at mile 11.76 Prospect Street, gravel ramp; mile 6.65

Vernon: Vernon Dam, owned by NEP, concrete ties; mile 5.58

Along the river's banks, people enjoy hiking, cross-country skiing, horseback riding, and snowmobiling, particularly along the former railroad beds. Hinsdale and three other area New Hampshire towns have given their written support to the concept of converting rails to trails, and portions of the Ashuelot Rail Line, abandoned in 1982 and purchased by the State of New Hampshire in 1995, are being developed as a trail corridor. The line follows the Ashuelot River through Hinsdale to Winchester, Swanzey, and Keene, where it links with other trail corridors. The trail passes through scenic country and small communities, wetlands and wildlife habitat, and farms with dramatic vistas. The Wantastiquet Trail in Chesterfield and Hinsdale, which parallels the river and ascends Wantastiquet Mountain, is a favored hiking route. Bicycling is popular along the Connecticut River, particularly on a loop along river roads and bridges from Putney. An outfitter in this town offers a brochure with suggested routes.

Many area residents enjoy birdwatching along the river. The Cheshire line below the Westmoreland Station bridge passes through good songbird habitat. A particularly good birding vantage point is the Fort Hill Railroad corridor, recently purchased by the State of New Hampshire and converted to a hiking trail, between miles 2-13. The area of Vernon Dam is a

Boating

Along the Banks

favorite eagle observation point, where year-round open water provides the birds with good fishing when other waters are frozen over.

Picnicking is popular on the islands, at the New England Power Company access points at Walpole and Vernon. The fish ladder at the Vernon Dam is also an attraction for tourists and residents alike.

Camping takes place at Stebbins Island, and New England Power Company has recently rehabilitated this 29 acre site at mile 4.64. NEP also owns Hinsdale Canoe Rest Area at mile 10. There are currently no other campsites along the river, although there are two campgrounds offering hookups, located on Route 5 west of Interstate 91 in Brattleboro.

Other Recreational Opportunities

Westminster: Athletic fields at Bellows Falls Union High School.

Walpole: Athletic fields north of and in Walpole village. Golf course south of Walpole village. Bellows Knatt Trail east of Walpole village.

Putney: Athletic fields at Landmark College.

Dummerston: Two campgrounds off Route 5 on Pines State Park. Athletic fields at the school near East Dummerston.

Chesterfield: Park area north of West Chesterfield.

Brattleboro: Swimming in West River. Park associated with Brattleboro Retreat. Fort Dummer State Park.

Hinsdale: Park near mouth of Liscomb Brook. Athletic fields at Hinsdale school and high school. Park in the far south of town.

Vernon: Fish ladder at the Vernon Dam

Conditions Needed to Sustain Recreation

- ◆ enforcement of existing boat speed law
- ◆ water quality suitable for swimming and other water sports
- ◆ continued maintenance of campsites and boat launches owned by NEP as currently handled by the company
- ◆ isolated areas near the river which offer excellent wildlife observation and habitat must be protected from overuse

POTENTIAL RECREATIONAL OPPORTUNITIES

More access is needed for canoes and kayaks. Use of the river by such small boats is more localized than by power boats, and therefore requires more access points. Canoes, kayaks, and pontoon boats present substantially less threat to eroding banks and to fishermen than do larger power boats. However, there may be a need for additional trailered boat access in the town of Westmoreland.

Boating

- ◆ better access to trail system
- ◆ connection between Wantastiquet Trail and/or Fort Hill Line trail in New Hampshire and Vermont's Whetstone Brook trails over the Fort Hill railroad bridge and/or the Route 9 bridge
- ◆ walking tour/interpretive trail along Cheshire line below Westmoreland Station bridge
- ◆ better utilization of abandoned railroad lines and Class 6(NH)/Class 4(VT) roads as trail corridors, particularly since New Hampshire has recently allowed towns to turn their Class 6 roads into trails, thereby allowing more local control of these features
- ◆ interpretive center on the river's bank at mile 7, New Hampshire side; proposed by Friends of Pisgah

Trails



River Camping

- ◆ possible development of campsite or trails at Dunshee Island at Walpole, given by Hubbard family to New Hampshire Fish and Game Dept.
- ◆ campsite in Westmoreland
- ◆ good areas for picnicking and trails include the stone arch railroad trestles at Aldrich Brook in Walpole, and should be targeted for easements
- ◆ potential tourist excursion train along the river from Brattleboro to Charlestown

CURRENT PROBLEMS

- ◆ conflict between canoes/kayaks and power boats
- ◆ inadequate enforcement of existing boat speed law
- ◆ boaters are sometimes unaware of the boat speed law and proper boating etiquette
- ◆ boat wakes striking the shoreline cause bank erosion and sedimentation
- ◆ water-skiing occurs where the river is too narrow to accommodate it
- ◆ inadequate access for canoes and kayaks
- ◆ use of jetskis sometimes conflicts with fishing; these craft can travel further upriver than other small boats because of their shallow draft
- ◆ parking area at Hinsdale boat ramp is often full and cars with trailers park along the road on private property
- ◆ while there are a number of trails in the region, they are for the most part short and isolated from one another
- ◆ the current trail system on the New Hampshire side is limited to private land and access behind Walmart
- ◆ erosion is occurring on some of the steeper trails; more trail maintenance is required
- ◆ better signage is needed for trails in Hinsdale

"As you see increased use of a valuable natural resource like the river, there has got to be an understanding of all involved, for others' rights and needs."
Chesterfield planning board member

POTENTIAL CHALLENGES

Swimming and other water contact recreation is considered threatened in the entire Wantastiquet reach of the river, according to Vermont water quality studies, because of nonpoint sources of pollution including runoff from urban areas, landfills, industrial and municipal sources, and agricultural runoff. While no bacterial violations were found during sampling in 1992 and 1993, nonpoint pollution, sedimentation and algal growths which sometimes occur as a result of nutrient enrichment and erosion may make swimming less desirable here. Other challenges:

- ◆ high boat use may damage the riverbank and threaten safety
- ◆ campsite locations may conflict with archeological resources
- ◆ potential impact of overuse by tourists
- ◆ potential dangers for swimmers at certain locations, which should be identified
- ◆ access points for trailered boats are currently at capacity
- ◆ potential nuisance from motorized trail travel in residential areas

OBJECTIVES

Encourage slow travel on the river to minimize bank erosion. There is currently adequate access on the river for power boats, except perhaps at Westmoreland. Conscientious recreational use should be promoted, but there is a need to balance this with the multiple uses of the river. Citizens should educate themselves about existing regulations.

STATE GOVERNMENT *should:*

- ◆ encourage boater education, particularly on the erosion impacts of boat wakes
- ◆ provide more consistent enforcement of existing boat speed laws
- ◆ seek mapping to better define the width of the river for enforcement of speed laws
- ◆ encourage canoeists and kayakers to use the sides rather than the middle of the river to help avoid conflict with power boaters.
- ◆ New Hampshire complete boat access in Walpole
- ◆ otherwise establish and maintain limited access to the river to avoid too much impact. Improvements to existing access and new access to accommodate trailered boats should be added only after good planning and with awareness of the potential environmental impacts.
- ◆ New Hampshire work with Upper Valley Land Trust to develop trails and canoe campsite on state property at Dunshee Island in Walpole
- ◆ promote "Earthworks" student project at Dunshee Island
- ◆ involve state archeology offices in selection of campsite locations
- ◆ work toward improved water quality
- ◆ identify areas where swimming should be discouraged
- ◆ encourage education of residents and visitors, particularly about the impacts of different forms of recreation and visitor etiquette.
- ◆ add sidewalk to Route 9 bridge to facilitate cross-river trail connections
- ◆ New Hampshire Division of Resources and Economic Development should operate and maintain the Ashuelot rail corridor as a hiking trail
- ◆ support the efforts of local trails organizations such as the Ashuelot Rails to Trails Association, and the development of their partnership with state natural resource and transportation agencies and town governing bodies, to cooperatively plan for trail corridors and resolve issues of conflict.

TOWNS *should:*

- ◆ work toward improved water quality
- ◆ encourage birdwatching and other low impact forms of recreation
- ◆ support the efforts of local trails organizations such as the Ashuelot Rails to Trails Association, and the development of their partnership with state natural resource and transportation agencies to cooperatively plan for trail corridors and resolve issues of conflict
- ◆ encourage construction of additional access for canoes, kayaks, and other cartop boats. Improvements to existing access and new access to accommodate trailered boats should be added only after good planning and with awareness of the potential environmental impacts.
- ◆ encourage development of marina off-rivers, if there is sufficient need, to avoid associated problems with petroleum product contamination, additional power boat and jetski traffic, and erosion
- ◆ carefully consider expanding the parking facilities for the Hinsdale boat ramp

LANDOWNERS *should:*

- ◆ work toward improved water quality

BUSINESS COMMUNITY *should:*

- ◆ encourage education of residents and visitors, particularly about the impacts of different forms of recreation and visitor etiquette
- ◆ New England Power Company or its successors should install permanent signage at its boat launches, reminding the public of the boat speed law, the problem of bank erosion, and proper boating etiquette

CITIZEN GROUPS *should:*

- ◆ Friends of Pisgah (NH) should act as umbrella group for local trails organizations, such as Pathways for Keene. The Ashuelot Rails to Trails Association is another citizens group, working to keep intact the 23 mile corridor Ashuelot Branch of the old Boston and Maine Railroad for best public use, including recreation, conservation, and transportation.
- ◆ develop more published information on trail systems
- ◆ explore possible connections between trail systems
- ◆ address trail erosion with increased trail maintenance
- ◆ provide better signage for trails
- ◆ the Wantastiquet Subcommittee should verify the trail information on GIS databases in regional planning commissions
- ◆ Audubon Society chapters should advise area residents on local birding areas and how to reach them
- ◆ Upper Valley Land Trust should work with New Hampshire Fish and Game Dept. to develop primitive campsites and involve state archeology offices in selection of campsite locations
- ◆ enjoy boating on the river, particularly from canoes, kayaks, pontoon boats, and other craft which pose less threat to eroding riverbanks

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.

MAPS

◆
Wantastiquet Region- Recreation, MicroDATA, 1994. GIS map produced for the CRJC and the Wantastiquet 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 Walpole/Westminster through Hinsdale/Vernon. 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

Trails and Railroad Beds, Southwest Regional Planning Commission, 1995. GIS map showing trails and railroad beds covers the towns of Walpole, Alstead, Surry, Westmoreland, Keene, Chesterfield, Swanzey, Winchester, and Hinsdale. Scale 1:48,000

Windham Region Trails, Windham Regional Commission, 1995. Map shows several classifications of existing and proposed trails, Class 4 roads, public lands, regional and resort centers, and functional class roads in the Windham planning region of southeastern Vermont. Scale 1:100,000



A GRICULTURE

FARMING ALONG THE CONNECTICUT RIVER

Connecticut River Valley floodplain soils of the Wantastiquet region are among the most productive agricultural soils in the entire region. Deep, nutrient-laden sandy loam is a widespread soil type on the valley floor. These easily worked and relatively efficient riverfront lands have been prized for agriculture since the area's first settlement, and have a diverse agricultural history. New Englanders quickly converted these flat, wet expanses to crop land in the 18th and 19th centuries as settlement advanced up the river valley. The stony loams of the valley walls have excellent forest sustaining properties. In general, soil is largely responsible for the pattern of forest, farm, and town seen in the Connecticut valley today. The region's agricultural lands are a primary element in the rural aesthetics of the area, contributing to the views and fall foliage attractions for visitors to the two states.

The average sales of agricultural products per acre on these soils is substantially higher than elsewhere in the Connecticut River Valley. Cheshire County averaged \$490.14 in 1987, compared to \$265.5/acre for the entire New Hampshire portion of the valley, while Windham County averaged \$251.82 per acre compared with \$212.47/acre for the entire Vermont portion. It is estimated that these soils produce a more consistent yield than those of New York State, and a comparable if not better yield of corn per acre than soils of the Midwest.

Close to the river, the frost-free growing season is considerably longer on the Wantastiquet region's floodplain soils than on adjacent uplands anywhere else in either state, a condition that greatly multiplies their agricultural value. The extended growing season allows Wantastiquet farmers to grow the higher yielding, longer maturity strains of corn, and reduces pressure to manage crops within a narrow window of time. Riverfront farms are also less susceptible to drought than their upland counterparts.

AGRICULTURAL LAND USE IN THE RIVER CORRIDOR

In 1992, 130 of the 198 farms in Wantastiquet region towns were located in Vermont; of these, 82 were operated by people for whom farming was their principal occupation, and 25 sold more than \$100,000 worth of agricultural products in that year. Of the 68 farms on the New Hampshire side of the river, only half listed farming as the owners' principal occupation. Twelve of these farms sold more than \$100,000 worth of agricultural products in 1992 (*source: USDA New England Agricultural Statistics Service*).

Tobacco was once grown as far north as Walpole. During most of the 20th century, riverfront soils have been used to grow crops to support dairy and livestock farming, although within the last five years, vegetable, fruit, and ornamental production have increased. Sheep farming remains prominent in the region.

Vermont

Westminster: South of the village area, except where Route 5 and the railroad approach the river and in the industrial zone in Westminster Station, land along Route 5 is agricultural. (8 farms in 1992)

Putney: River View Farm is conserved land. The farm is reputed to be the largest sheep farm in New England. North of River View Farm is Great Meadows, 4-500 acres of the finest

Productive Soils

Long Growing Season

agricultural land in Windham County. The remaining land in the river corridor is agricultural except for the residential section near East Putney Station and the commercial area near Exit 4 and Putney village. (49 farms in 1992)

Dummerston: Close to the river and the railroad, the land is agricultural in the northern part of town. The southern third of town is forested or agricultural. (60 farms, including Brattleboro land, 1992)

Brattleboro: There are few large areas of open space in the river corridor in Brattleboro.

Vernon: In the northern half of the river corridor, agricultural and forested land are scattered between industrial areas. Below the mixed residential section beside the Vernon Dam, the land is agricultural. (13 farms, 1992)

New Hampshire

Some of the productive fields on the New Hampshire side have been protected, principally in Walpole and Westmoreland.

Walpole: North and south of North Walpole village the land is forested. Land south of the mixed residential area near the mouth of Cold River and along River Road is generally agricultural. Boggy Meadow Farm has been protected. (27 farms in 1992)

Westmoreland: Land along the river corridor is generally agricultural with forests in the northern part of town and near the County Complex. The County Farm is considered protected land, as is Windyhurst Dairy Farm and Parker's Farm. (22 farms in 1992)

Chesterfield: There is municipally-owned, protected land just south of Route 9 in Chesterfield. Land along River Road is forested and agricultural above West Chesterfield. Below West Chesterfield, agricultural land gradually merges with mixed residential use. (5 farms in 1992)

Hinsdale: Forested land continues south of the Wantastiquet State Forest. The riverbank south of the confluence of the Ashuelot River is bordered by farmlands and forests. (14 farms in 1992)

CONDITIONS NEEDED TO SUSTAIN LOCAL AGRICULTURE

- ◆ protection of prime agricultural soils from development and erosion
- ◆ current use taxation program
- ◆ access to good markets via Route 91
- ◆ adequate infrastructure of agricultural suppliers, distributors, veterinary services
- ◆ consumer recognition of the costs of food production and desire to support local agriculture
- ◆ adequate and fair price for farm products
- ◆ assistance from Natural Resources Conservation Service, Farm Services Agency, state departments of agriculture, and Cooperative Extension Service
- ◆ mutual understanding between farmers and the non-farming public about the needs of agriculture

*"What is good for
farmers should be good
for consumers."
Brattleboro citizen*

POTENTIAL AREAS FOR EXPANSION

- ◆ better local markets for local produce, such as a regional farmers' market and farm stands
- ◆ utilization of manure as a cash crop
- ◆ hobby farming as a means of keeping land open and maintaining demand for infrastructure and support services
- ◆ increased diversity of production, including locally produced specialty foods, locally bottled water
- ◆ a commercial cooks' kitchen

- ◆ small local dairy processing plant to serve smaller farms; more value-added dairy products
- ◆ more maple sugar production
- ◆ increased local production of beef and lamb; potential market for Holstein dairy beef within the valley as long as a local slaughterhouse could service this market
- ◆ horse-drawn sleigh and wagon rides for the tourist industry, which in turn could support another market for hay, a crop less demanding upon water and soil than corn
- ◆ nutrient addition and soil conditioning from biosolid application

CONDITIONS NEEDED TO MAKE THESE POSSIBLE

- ◆ local supermarkets receptive to carrying local produce
- ◆ economic and marketing environment conducive to sale of local produce
- ◆ education for those interested in becoming hobby farmers
- ◆ application of biosolids where beneficial as part of a total nutrient management plan



CURRENT PROBLEMS

- | | |
|---|---------------------------|
| ◆ some farmland, particularly that located primarily away from the river, is being allowed to go fallow, increasing the cost and effort necessary to bring this land back into production, and prompting its sale for non-agricultural purposes | Loss of Farmland |
| ◆ loss of agricultural land to development, often when it is sold by farmers at retirement | |
| ◆ declining numbers of farms | |
| ◆ bank erosion | |
| ◆ close juxtaposition of farm and residential land use sometimes leads to conflicts | Conflicts with Newer Uses |
| ◆ traffic conflicts with agricultural vehicles | |
| ◆ disrespect of property rights of farmers by those who use their land without asking the landowner's permission or who damage crops | |
| ◆ farmers need a fair price for their product; a global economy based upon cheap energy allows an influx of competing, lower priced products from other areas | Costs |
| ◆ high capital cost of setting up a farming operation | |
| ◆ there are still some farms in the area without adequate manure storage | Pollution Control |
| ◆ degradation of water quality in Connecticut River tributaries such as East Putney Brook where livestock are unfenced and allowed access to streams | |
| ◆ high cost of compliance with many environmental regulations and best management practices | |
| ◆ Farm Service 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 five years, or to those who have recently made other major improvements; this discourages new farmers and discourages other improvements | |
| ◆ cost-shared projects often require such overengineering by NRCS that the farmer could build the facility himself for less than his share of the match | |

POTENTIAL PROBLEM AREAS

- ◆ potential for nonpoint pollution in runoff from areas where livestock is kept in high density without adequate management
- ◆ transportation interruptions can disrupt food supplies from out of the area

- ◆ development pressure on agricultural lands
- ◆ nutrient lockup resulting from overapplication of high-pH stabilized biosolids

OBJECTIVES

The Wantastiquet Subcommittee seeks to maintain active, economically viable agriculture in the region while minimizing the impact of agricultural activities upon the river. Prime farmland soils should be given a priority protection status to avoid loss of exceptional natural resources and agricultural potential. The agricultural soils in this area are so valuable that holding them open for agriculture and feeding humans is justified for the future. These soils are best suited, economically and environmentally, for growing food, forage, fiber, and oilseed crops.

FEDERAL GOVERNMENT

U.S. Department of Agriculture *should:*

- ◆ support Northeast Dairy Compact
- ◆ establish an agricultural land protection program to ensure that the better agricultural soils are kept available to feed the future population
- ◆ increase funding for Cooperative Extension Service and Conservation Districts to provide educational services and assist farmers

Farm Service 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 five years and those who have not recently undertaken major improvements. Perhaps farmers who purchase existing farms could have their eligibility grandfathered.
- ◆ adopt consistent, simple terms for cost-sharing programs

Natural Resources Conservation Service *should:*

- ◆ provide education for farmers on sources of assistance with improvements such as fencing to keep livestock out of streams
- ◆ advise farmers on appropriate measures for bank stabilization

USDA Cooperative Extension Service *should:*

- ◆ educate the public about the value of locally-produced foodstuff
- ◆ work with farmers to develop nutrient management plans
- ◆ educate the public and current and would-be farmers about the concept of community-supported agriculture
- ◆ provide accessible education both for people interested in hobby farming and for full-time farmers
- ◆ encourage small part-time farming as a viable form of agriculture; utilize financial programs, markets, and educational tools

STATE GOVERNMENT *should:*

- ◆ strengthen state agricultural departments, particularly in New Hampshire
- ◆ adopt a favorable taxation policy for agricultural land, particularly protected land
- ◆ provide more marketing assistance to farmers
- ◆ encourage the University of New Hampshire to maintain its agricultural program and to include expanded collaboration with other New England state universities

TOWN GOVERNMENT *should:*

- ◆ adopt a favorable taxation policy for agricultural land, particularly protected land
- ◆ encourage siting of development for minimum impact upon agricultural soils, such as through cluster zoning
- ◆ consider undertaking an inventory of agricultural soils in order to know where to encourage development and where to restrict it to agricultural use

R E C O M M E N D A T I O N S

- ◆ consider a cost/benefit analysis to discover the value to the town of protecting open space through savings in costs of schooling, fire and police protection, road maintenance, and other services on land that is not developed for housing; regional planning commissions can assist with such analysis
- ◆ encourage small part-time farming as a viable form of agriculture

Farmers should:

- ◆ become more aware of estate tax issues and seek advice on estate planning
- ◆ utilize best management practices as a means of economizing in fertilizer use
- ◆ work with Conservation Districts and Cooperative Extension Service to prepare a total nutrient management plan for their farm, to make best use of available nutrients, reduce cost of fertilizer purchases, reduce potential for water quality impacts, and determine if, where, and when biosolid application could benefit the farm operation

Business community should:

- ◆ establish a regional wholesale/retail farmers' 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:

- ◆ share in cost of protecting riverfront agricultural lands because the public will benefit in the future when this land base is still available for food production, open space, and flood control

"BMPs make sense, and with falling milk prices, farmers will have to follow them to economize, providing they can afford the initial investment."²
Westmoreland farmer

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.

MAPS

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 Wantastiquet 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 have been provided to NH riverfront towns through the LRS.

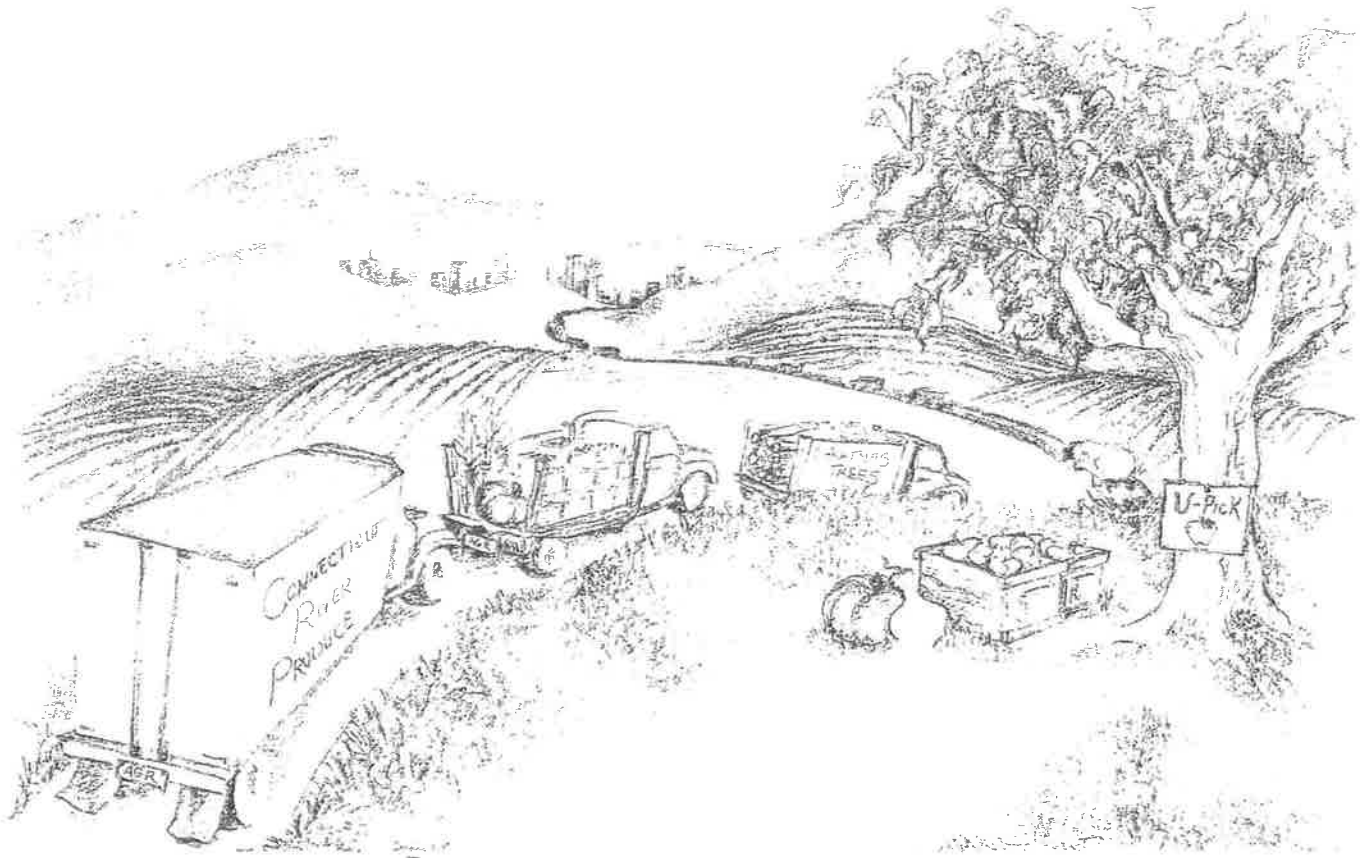
Development Constraints by Soil and Existing Land Use, Southwest Regional Planning Commission, 1997. GIS map produced for the Wantastiquet LRS with support from NH DES shows important farmland, slopes 15% or greater, wetlands, and six categories of land use, with property lines, within ½ mile of the Connecticut River in Walpole, Westmoreland, Chesterfield, and Hinsdale. Acreages of each soil type and land use type are included. Scale 1:42,000

Flood Area, Zoning, and Land Use, Southwest Regional Planning Commission, 1997. GIS map produced for the Wantastiquet LRS with support of NH DES shows 100 and 500 year floodplains and land use zones within ½ mile of the Connecticut River in Walpole, Westmoreland, Chesterfield, and Hinsdale. Acreages of the flood area and each zoning type are included. Scale 1:42,000

Connecticut River Resource Protection Project, GIS maps produced by Windham Regional Commission for the Wantastiquet LRS and the riverfront Windham region towns, with support by the CRJC Partnership Program, 1997. Maps have been produced both for the region including Rockingham, Westminster, Putney, Dummerston, Brattleboro, and Vernon, and for each individual town. Scale varies.

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

OUR HISTORY ALONG THE RIVER

The Connecticut River has long woven the natural and cultural fabric of the valley together to create the industrial and agricultural heritage of the Wantastiquet region. The rich soils forming the basis for an agricultural history of thousands of years are a gift of the river. Historic agricultural landscapes and building complexes throughout the region still define its rural character, supported by covered bridges, stone walls, dirt roads, and stone culverts. Diverse small-scale industries, followed later by large-scale manufacturing, have depended upon the river for their power, and once also depended upon the river to move their raw products to market. Village clusters still retain their nineteenth century flavor, and at Brattleboro, commercial and cultural buildings spanning 140 years represent a long-vibrant urban center.

The following is a sample of some of the many historic and prehistoric sites in Wantastiquet Region towns:

Westminster: There are 67 sites in the National Register Historic District of Westminster village. Westminster was the first township granted in Vermont, by the government of New Hampshire. The first state convention was held there in 1775 and the town once served as the de facto state capital.

Walpole: Walpole village is of great historic significance with its many beautiful old houses and graceful Academy building. There are also two historic sites in North Walpole. The Great Falls at Walpole/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 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.

Putney: Putney Village Historic District has numerous sites. There were two ferry landings, one at Great Meadows and one at historic River View Farm, which is the largest sheep farm in New England.

Westmoreland: The hamlet of Park Hill is the site of many historic buildings. Park Hill Meeting House was built elsewhere in 1762, and moved to its present location in 1799 on Federal Hill. A steeple with a bell cast by the Paul Revere Foundry was added in 1826, when the church was extensively remodeled in the Greek Revival style. There were three ferry landings: the Britton landing was northernmost and led to Putney, as did the central landing. South of these was Wares landing to Dummerston. The town features a unique timber-concrete composite bridge.

Dummerston: The first maple syrup made in Vermont by settlers of European descent was boiled here at Ranney Farm. There were two ferry landings: the southern landing served Chesterfield, and the northern one served Westmoreland. Naulakha, home of Rudyard Kipling, where he lived and wrote from 1892 to 1896, is now a National Historic Landmark. One of Vermont's finest Shingle Style residences, it was designed by Kipling himself and is now operated as a bed and breakfast by the Landmark Trust of America.

Chesterfield: A ferry once carried traffic to Dummerston. Stone Foundations in Pisgah State Park mark the birthplace of Harlan Fiske Stone, Chief Justice of the U.S. Supreme Court, appointed by F. D. Roosevelt.

Brattleboro: The downtown National Register Historic District embraces commercial buildings from Federal to Modernistic in style, including the Brattleboro Museum and Arts Center, which is now located in the former 1916 key railroad station. The 1938 Art Deco Latchis Hotel and Movie Theater is listed on the National Register. Vermont Asylum for the Insane, founded in 1834, one of the first hospitals in the country for the treatment of mental illness, is now a private hospital with its own farm that dates from the 1860s and Estey Organ Complex (National Register), largest organ manufacturer in the world in 1880, made more than 250,000 reed organs and employed 500 men and women before pianos eclipsed their popularity. A reconstruction of the 1724 Fort Dummer stands at a state park in Brattleboro. The site of the original fort is now inundated by Vernon Dam.

Hinsdale: There are forty-two historic sites, 16 of which are in the village district. These sites include churches, schools, meetinghouses, homes, mills, factories, businesses, and farms. The Sheepskin Tavern, 1745, was a public house for swift-water rivermen. There was once a ferry landing (to Vernon) and on Wantastiquet Mountain, an old ocher mine. Hinsdale once had two forts, Fort Hinsdale and Daniel Shattuck's Fort, now marked by monuments. The Fort Hill site was a fortified settlement built and occupied in 1663 by Squakheags, also known as Sokokis, who allied with the French to protect themselves against raiding Mohawks. The Holman and Merriman Machine Shop (1875) was the site of construction of a steam-propelled, charcoal-fired four-wheel automobile. Its inventor, George Long, built an automobile propelled by gasoline, now in the Smithsonian.

Vernon: An old ferry landing was located just below Stebbins Island. Other historic sites include the Governor Hunt mansion at Vermont Yankee, and a few sites at Pond Road and Route 142. Fort Dummer was built in Vernon in 1724 as the most northerly of a string of six forts across northern Massachusetts which were completed about 1745 to protect anticipated immigration from the south. The fort was dismantled in 1763 when it was no longer required. The site of the original fort is now inundated by Vernon Dam, and a reconstruction of the fort is located in a state park in Brattleboro.

MAKING THE MOST OF HISTORY IN THE FUTURE

- ◆ tourists in the region could be attracted by and better appreciate the Wantastiquet region's history and pre-history, bringing dollars into the area by respectful visitors through "heritage tourism"
- ◆ adaptive reuse of historic buildings could be encouraged, rather than razing, rebuilding, and/or development of commercial sprawl outside the historic village center
- ◆ clustering of new development could help minimize its visual impact on agricultural landscapes
- ◆ there is potential for an excursion train from Brattleboro to Charlestown, along the river, similar to that operated by the Green Mountain Line to Chester, Vermont

CONDITIONS NEEDED TO MAKE THESE POSSIBLE

- ◆ careful education and promotion of the historic values of the region
- ◆ respect of private property rights by visitors and residents alike
- ◆ promotion of train excursions

CURRENT PROBLEMS

- ◆ decay and indifference to historic building on the part of some owners
- ◆ loss of stone walls through road widening projects, insensitive development, and pilfering for the residential home landscape

- ◆ need for education of citizens and for owners of historic buildings and sites

POTENTIAL PROBLEMS

- ◆ loss of agricultural landscapes and identity of historic village clusters
- ◆ decay and removal of agricultural outbuildings by non-farming owners
- ◆ bank erosion exposing archeological sites; looting of archeological sites
- ◆ deterioration of historic bridges if they are taken out of service
- ◆ replacement of stone culverts
- ◆ road "improvement" projects may detract from character of area
- ◆ lack of mechanism for adequate public participation in some state transportation agency planning

OBJECTIVES

The Wantastiquet Subcommittee wishes to see the varied and rich cultural and historic heritage of the Wantastiquet Region remain evident for the enjoyment and education of both residents and visitors.

STATE AGENCIES *should:*

- ◆ provide education for town officials, students, homeowners on historic resources
- ◆ seek greater cooperation between state archeology offices and local people
- ◆ protect archeological sites with appropriate bank stabilization

Departments of Transportation *should:*

- ◆ work with state historic preservation offices to establish fund for maintenance of historic bridges
- ◆ ensure adequate public participation in the early stages of planning road and bridge projects
- ◆ avoid impacts to stone walls and historic resources

TOWNS *should:*

- ◆ investigate projects which are possible with support of the Certified Local Government Program of their state historic resources office

LANDOWNERS *should:*

- ◆ learn about historic resources in their towns

CITIZENS GROUPS *should:*

- ◆ participate in the Tri-State Scenic Byway Study to be certain that it is responsive to their area's interests and concerns and provides their towns with the information they will find most useful; work with Southwest and Windham regional planning commissions
- ◆ historical societies educate their fellow citizens about local history and how it relates to the Connecticut River; consider writing and publishing histories of their town and conducting oral history interviews
- ◆ local residents 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:*

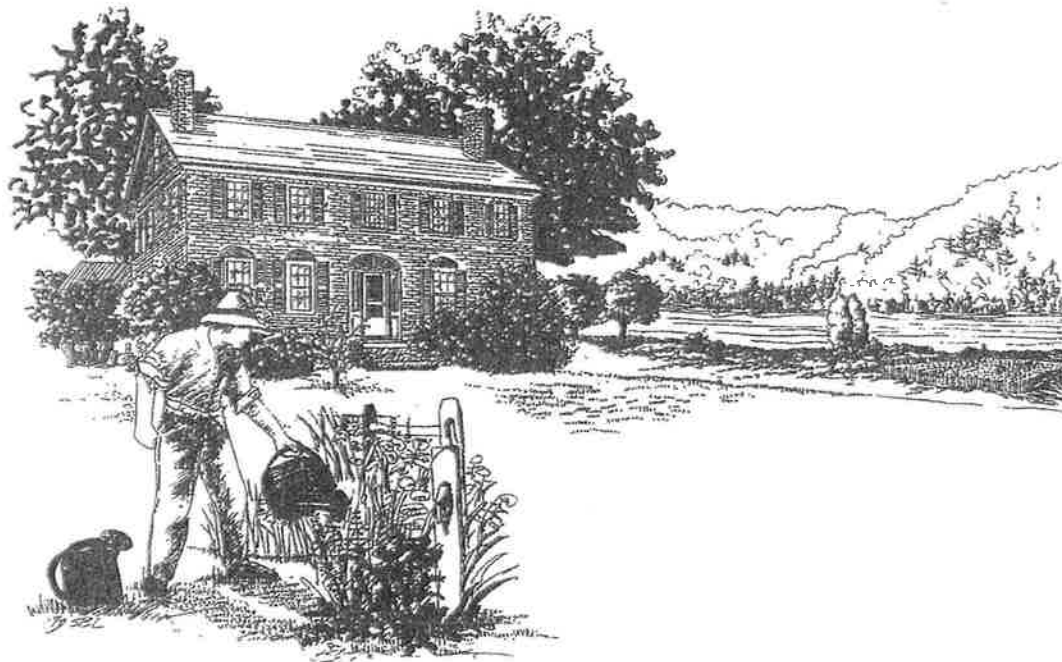
- ◆ adopt a cross-river cooperative approach to developing heritage tourism (Bellows Falls, Vermont-Walpole, New Hampshire, for example)
- ◆ consider a Precision Valley Heritage Corridor to include towns which contributed to the history of precision manufacturing and the machine tool industry, such as Keene and Claremont, NH, and Springfield and Windsor, Vermont
- ◆ media carry regular features on topics of local history and heritage

R E C O M M E N D A T I O N S

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 of interest 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 Wantastiquet region towns.





FUTURE LAND USE

ALONG THE RIVER TODAY

The Wantastiquet region embraces perhaps a wider diversity of land uses than any other stretch of the Connecticut River north of Massachusetts. A nuclear power plant draws cooling water from the river a short paddle away from seemingly impenetrable wetlands brimming with wildlife, and business goes on in a healthy urban center just downstream from fruitful flyfishing waters and farmlands. Vibrant modern communities share the riverfront with prehistoric sites and colonial villages. People are undeniably more common than peregrines in the Wantastiquet region, but both appreciate the traditional character of the place.

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.

A look at the Wantastiquet region towns for the Connecticut River's nomination into the NH Rivers Program provides a sketch of local land use and scenic resources:

Westminster: The village of North Westminster, just below the mouth of the Saxtons River, gives way to mixed residential land and open space. Westminster village is more densely settled and includes areas of commercial and industrial activity. South of this village, land use is of rural character with occasional houses. There is a commercial area in the southern part of town where Route 5 and the railroad pass close to the river. There are lovely views of farmland from the river, and from the land, looking north from the bend in Route 5 north of Westminster Station.

Walpole: North Walpole and Walpole villages concentrate typical village land uses. There are mixed residential districts north and south of Walpole village and at the mouth of the Cold River. In the far south of town, along River Road, the land use is residential, but it retains a rural character. Walpole offers many scenic views of the river and its islands from River Road, and from Route 12 north of North Walpole. The dramatic gorge below the Bellows Falls Dam can be seen from Route 12. At the mouth of the Cold River, there is a good view north from Route 12. From the river, there are fine views of Fall Mountain.

Putney: Land use in the river corridor is rural in character with occasional residential development. Route 91 and the railroad are close to the river in places. There is a residential area south of East Putney Station and a commercial area near Exit 4 from Route 91 at the south end of town. Putney offers a number of scenic views, especially to the north from Route 5 near Great Meadows.

Westmoreland: Land use in the river corridor is primarily residential and open space. Use is residential and mixed residential along River Road in the north. The Cheshire County complex is institutional, but is rural in character. River Road is residential in the south and there is a gravel pit in the far southern part of town. Route 63 and River Road are scenic drives throughout their lengths in Westmoreland. From the river here are views of farmland and the hills beyond.

Dummerston: The river corridor is primarily occupied by Route 91 and the railroad in Dummerston. These linear features are bordered by open space. There are areas of commercial and mixed residential development in the northern part of town near Putney village. There is a small industrial area in the far south near Brattleboro. There are excellent views of the river from Route 91 south of Exit 4 and from Route 5 at about the same location.

Chesterfield: The river corridor is primarily rural in character. Land use is residential on River Road in the far north. There is a residential section in the area of West Chesterfield village, and the Route 9 corridor is mixed residential. River Road is scenic throughout its length. The trail up Mount Wantastiquet offers excellent views of the river and surrounding area. There are also good views of the river from West Chesterfield.

Brattleboro: Land use in Brattleboro's river corridor consists of industry in the northernmost and southernmost parts of town, commercial activity near the West River, village uses in the center of town, and residential uses south of the West River. There are excellent views of the river north of Exit 3 on Route 91. The scenic area at the confluence of the West River includes Retreat Meadows.

Hinsdale: There are two mixed residential areas which are fairly rural and two very limited commercial areas in Hinsdale between Wantastiquet Mountain and the mouth of the Ashuelot River. Generally, the river corridor has a rural character. Route 119 offers good views from Hinsdale village north to Brattleboro, and Route 63 in Hinsdale offers scenic views both up and down the river. At the confluence of the Ashuelot River, there are excellent views from north and south to Cooper Point, the islands, and Vernon. The trail up Mount Wantastiquet offers excellent views of the river and region.

Vernon: North of the Vernon Dam there are three industrial areas including the nuclear power plant. There is a small residential section in the northern part of town and a mixed residential section along the bend in the river south of Vernon Dam. The town's back roads, such as Tyler Hill Road, offer a number of scenic views of the river. There are also good views from the river looking towards Vernon's hillsides.

POTENTIAL LAND USES TO BE ENCOURAGED

These 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
- ◆ more protection of agricultural land and wildlife habitat from development
- ◆ restored buffers of vegetation along the river
- ◆ more access for canoes, kayaks, and other cartop boats
- ◆ trails, trail centers, campsites
- ◆ attractions oriented toward cultural and natural heritage tourism

CURRENT AND POTENTIAL PROBLEMS

The return of the river from its long reputation as a well-landscaped sewer has made it attractive once again for residential development at a time when population pressures are increasing from south of the border. The extraordinary scenic qualities of the river corridor and the flat, easily developed soils nearby are an easy target for development that could slowly erode the very qualities that attracted it. Development is presently causing water quality and other problems by exposing soils to erosion and removing riparian buffers, and fertile agricultural soils are being lost to residential and commercial construction. Homes and roads built too close to the river are threatened by riverbank erosion, most noticeably in North Walpole, where a major effort is underway to stabilize a deep sandy riverbank.

*"Prime farmland
soils should be
given a priority
protection
status. We are
going to need
these soils
in the future."
Dairy farmer*

OBJECTIVES

Prevent loss of the scenic character of the river corridor, to protect both the quality of life of local residents and the appeal of the river valley for tourism. Protect remaining agricultural uses, and avoid injury to water quality from future land uses. Prevent damage to property from bank erosion by not setting up an erosion-prone situation in the first place.



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 (x).

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 Wantastiquet Region, two segments of the Connecticut River are designated as *rural*:

- ◆ from the bridge at Westminster Station to the Brattleboro/Dummerston town line (17 miles);
- ◆ from the point .3 miles below the Vernon Dam to the Massachusetts border (5 miles).

Local zoning in Walpole, Westmoreland, Chesterfield, and Hinsdale, NH should honor the stipulations of this designation. Westminster, Putney, Dummerston, and Vernon, VT should also consider these provisions.

Rural-community segments

These are river segments “which 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 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 Wantastiquet Region, two segments of the Connecticut River are designated as *rural-community*:

- ◆ from the Saxtons River to the bridge between Westminster Station and Walpole (3 ½ miles),
 - ◆ from the Brattleboro/Dummerston town line to Sprague Brook in Hinsdale, NH (9 miles).
- Local zoning in Walpole, Chesterfield, and Hinsdale, New Hampshire should honor the stipulations of this designation. Westminster, Brattleboro, and Vernon, Vermont should also consider these provisions.

Community segments

Community river segments are those “which flow through developed or populated areas...and which 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.” Two segments of the Connecticut River in the Wantastiquet Region are designated as *community*:

- ◆ from the southern side of the Williams River to the Saxtons River in Westminster, Vermont including the Bellows Falls Dam (3 miles)
 - ◆ from Sprague Brook in Hinsdale to a point .3 miles below Vernon Dam. (1 ½ miles)
- Local zoning in Walpole and Hinsdale, New Hampshire should honor the stipulations of this designation. Westminster and Vernon, Vermont should also consider these provisions.

In addition to this general guidance of the Rivers Act, repeated here for consideration by towns on both sides of the river, the Wantastiquet Subcommittee offers the following specific recommendations:

STATES *should:*

- ◆ adopt the same setbacks for landfills
- ◆ provide attractive signage at river crossings identifying the Connecticut River

TOWNS *should consider:*

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

- ◆ prohibiting building in the floodplain to protect property values, retain flood storage, open space, and the scenic qualities of the river corridor, and to help minimize taxation to pay for disaster relief
- ◆ a building setback from river/streams: recommend at least 100', consider increasing this for steep slopes or highly permeable soils
- ◆ minimum setbacks of at least 100' for septic system leachfields
- ◆ requiring maintenance of a riparian buffer for visual screening, absorption of sound and pollutants, and bank stability
- ◆ minimizing public expenditures on capital improvements such as roads close to the river
- ◆ requesting that FEMA check floodplain maps to be sure they are accurate

...to sustain agriculture

- ◆ supporting agricultural activities through town policies
- ◆ adopting a favorable taxation policy for agricultural land, particularly protected land
- ◆ encouraging siting of development for minimum impact upon agricultural soils, such as through cluster zoning
- ◆ undertaking an inventory of agricultural soils in order to know where to encourage development and where to restrict it to agricultural use

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

- ◆ confining allowable uses of riverfront land to agriculture and residential
- ◆ encouraging conservation measures such as easements to protect scenic and recreational areas
- ◆ a cost/benefit analysis to discover the value to the town of protecting open space through savings in costs of schooling, fire and police protection, and other services on land that is not developed for housing; regional planning commissions can assist with such analysis
- ◆ a minimum lot size in areas dependent upon septic systems, determined by soil type, not to exceed 1 unit per at least 150' of shoreland frontage
- ◆ requiring that site plans for riverfront developments include plantings for visual screening; consider view from across the river and for recreationists
- ◆ design standards to address light pollution and encourage shielded or directional lighting
- ◆ requiring reclamation of gravel pits as they are retired
- ◆ allowing multiple uses in historic village buildings to permit economically viable use of these historic resources, to maintain the vitality of historic village centers, and to discourage suburban sprawl
- ◆ reducing runoff and minimizing the impacts of impervious surfaces on flooding
- ◆ discouraging point source pollution from industrial sources
- ◆ prohibiting establishment or expansion of salt storage yards, solid waste and hazardous waste facilities, and auto junkyards within at least 250' of the river

R E C O M M E N D A T I O N S

LANDOWNERS should:

- ◆ retain or encourage riparian buffers for visual screening and privacy, absorption of sound and pollutants, and protection of the riverbank from erosion
- ◆ consider conservation easements on their property to allow it to remain undeveloped and continue to contribute to the scenic quality of the area

BUSINESS COMMUNITY should:

- ◆ select existing commercial and industrial buildings for rehabilitation to suit their needs rather than building new facilities
- ◆ provide education to real estate customers about farming practices and being good neighbors to farms



REFERENCES

Wantastiquet Corridor Land Use and Development, in prep., Southwest Regional Planning Commission. Report to the Wantastiquet LRS on soil conditions, current land use, floodplains, zoning, and implications for future land use within ½ mile of the Connecticut River in the NH towns of Walpole, Westmoreland, Chesterfield, and Hinsdale. Prepared for the CRJC with the support of NH DES.

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.

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.



MAPS

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 Wantastiquet 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. Copies of the map have been provided to NH riverfront towns through the LRS.

Development Constraints by Soil and Existing Land Use, Southwest Regional Planning Commission, 1997. GIS map produced for the Wantastiquet LRS with support from NH DES shows important farmland, slopes 15% or greater, wetlands, and six categories of land use, with property lines, within ½ mile of the Connecticut River in Walpole, Westmoreland, Chesterfield, and Hinsdale. Acreages of each soil type and land use type are included. Scale 1:42,000

Flood Area, Zoning, and Land Use, Southwest Regional Planning Commission, 1997. GIS map produced for the Wantastiquet LRS with support from NH DES shows 100 and 500 year floodplains and land use zones within ½ mile of the Connecticut River in Walpole, Westmoreland, Chesterfield, and Hinsdale. Acreages of the flood area and each zoning type are included. Scale 1:42,000



Connecticut River Resource Protection Project, a series of GIS maps produced by Windham Regional Commission for the Wantastiquet LRS and the riverfront Windham region towns, with support of the CRJC Partnership Program, 1997. Maps have been produced both for the region including Rockingham, Westminster, Putney, Dummerston, Brattleboro, and Vernon, and for each individual town. Scale varies.

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.



Water Resources. Map shows the watersheds of public water supplies and wellhead protection areas, in addition to surface waters and major roads.

Natural Resources. Map displays deer wintering areas, state fragile areas, slopes greater than 25%, and natural heritage inventory sites for vertebrates and invertebrate species, significant natural communities, and plant species, in addition to surface waters and major roads.

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.





A CKNOWLEDGMENTS

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 Wantastiquet Region River Subcommittee:

Bill Appel, Ashuelot Rails to Trails Association and Friends of Pisgah
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Earl Brissette, Supervisor of Vernon Station, New England Power Company
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We are particularly grateful for the efforts of Steve Belczak of Westminster, long-time Co-Chair of the Wantastiquet Subcommittee, and extend our thanks to the Town of Westmoreland for providing meeting space in the Town Hall.

Technical assistance

Mapping and other technical assistance was generously provided by the Southwest Regional Planning Commission (NH), Windham Regional 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 in this publication.

◆ *Matt Brown* of Lyme, NH created the cover illustration using a self-taught method which pursues the tradition of color woodblock 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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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)



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



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 Cornerford 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

- 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 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*

- Primary buildings setback behind line.

50 ft

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

TOWN	Master Plan is in effect	Zoning is in effect	Town is enrolled in FEMA Flood Insurance Program	Resource mapping exists for river and adjacent areas	River is mentioned in master plan and/or zoning	Town has river-oriented regulations
Walpole NH	in development	yes	yes	yes*	yes	no
Westmoreland NH	yes	yes	yes	yes* plus ongoing wetlands mapping	yes	no
Chesterfield NH	yes	yes	yes	yes*	yes	no
Hinsdale NH	yes	yes	yes	yes*	yes	no
Westminster VT	yes	yes	yes	yes**	yes	1. Flood Hazard bylaw 2. 50' setback for water courses and wetlands, protects buffer 3. Regulates impoundments 4. Notice of ground or surface water impacts required for development or activity
Putney VT	yes	yes	yes	yes	yes	1. Flood Hazard bylaw 2. Standard regulations regarding stormwater drainage, sewage disposal 3. Resource Area designations for Conn. River, streams, and wetlands include setbacks for buildings and on-site septic disposal

TOWN	Master Plan is in effect	Zoning is in effect	Town is enrolled in FEMA Flood Insurance Program	Resource mapping exists for river and adjacent areas	River is mentioned in master plan and/or zoning	Town has river-oriented regulations
Brattleboro VT	yes	yes	yes	yes	yes	1. Flood Hazard bylaw 2. Sewage Disposal Ordinance 3. Shoreland Districts with setbacks, required vegetation buffer depth, sewage site setbacks
Vernon VT	yes	no	yes	yes**	yes	no

*river-related resource GIS mapping of each town prepared for the Wantastiquet Region River Subcommittee by Southwest Regional Planning Commission, New England Interstate Water Pollution Control Commission, and the Connecticut River Joint Commissions during the preparation of this plan

**river-related resource GIS mapping of each town prepared for the Wantastiquet Region River Subcommittee by Windham Regional Planning Commission and the Connecticut River Joint Commissions during the preparation of this plan

REFERENCE

Connecticut River Towns Water Resource Protection Features, Windham Regional Commission, 1995.



APPENDIX D

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

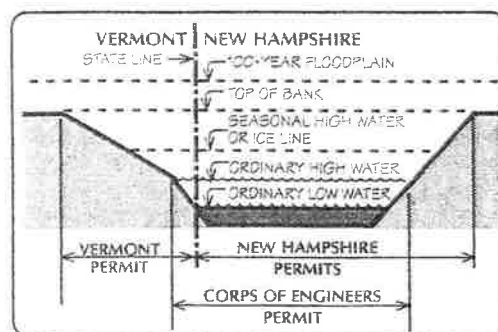
If the proposed project is located in or near a wetland, a site visit may be necessary. Impacts may be addressed under Title 10 VSA, Chapter 37, Section 905(a), 401 Water Quality Certification and Act 250.

- 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 10-13, Colchester, VT 05446 • Phone: (802) 655-0334 Fax (802) 655-0818





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 by Vermont's rules for "acceptable agricultural practices" between December 15 and April 1. Contact the New Hampshire Department of Environmental Services or Vermont Agency of Natural Resources, or your county office of the Natural Resources Conservation Service, for further information on the guidance or regulations which apply in your area (see Appendix G: Sources of Assistance).

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



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

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.



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 G

SOURCES OF ASSISTANCE

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

FEDERAL AGENCIES

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

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

NEW HAMPSHIRE 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

VERMONT STATE AGENCIES

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/Ottawaquechee RPC
King Farm, 5 Thomas Hill
Woodstock, VT 05091
802-457-3188

Southern Windsor County RPC
Box 320 Ascumey Prof. Bldg., Route 5
Ascumey, 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
Purney, 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.



A PPENDIX I

WANTASTIQUET REGION LOCAL RIVER SUBCOMMITTEE MEMBERS

- Stuart Adams, Westmoreland, New Hampshire
- ◆ Stephen Belczak, Putney, Vermont
- Earl Brissette, Vernon, Vermont
- Stuart Brown, Dummerston, Vermont
- ◆ Robert Burns, Putney, Vermont
- Linda Dierkes, Brattleboro, Vermont
- Jason Doubleday, Brattleboro, Vermont
- ◆ Janice Kos, Westmoreland, New Hampshire
- Susan Lawson-Kelleher, Chesterfield, New Hampshire
- Kenneth McGill, Walpole, New Hampshire
- Robert Miller, Brattleboro, Vermont
- William Perron, Walpole, New Hampshire
- Albert Rydant, West Chesterfield, New Hampshire
- ◆ Gordon Schofield, Hinsdale, New Hampshire
- Howard Sherman, Walpole, New Hampshire
- ◆ Sharron Smith, Hinsdale, New Hampshire
- John Wilmerding, Brattleboro, Vermont

- ◆ *elected officer of the Wantastiquet Region River Subcommittee*