

R I V E R

B A N K S &

B U F F E R S

No. 7



Guidance for Communities

in the Connecticut River Watershed

Our most fertile soils, our most valuable fish and wildlife habitat, and some of our most expensive real estate are found along rivers and streams. Add to that the power of flooding waterways to destroy private property, and here is a situation which begs for sensible town policy.

THE CHALLENGE

The high quality of life offered in the beautiful valley of the Upper Connecticut River, with waters clean and attractive once again, brings with it both the promise of growth and the threat of losing a landscape our children will recognize in the years ahead.

Our region has a long tradition of respect for the rights of individual property owners. This understanding must include concern for the rights of neighbors and, along rivers, for those downstream who can be directly affected by the actions of a single landowner. In the tug of war between unlimited freedom in the use of private property, and the need to protect both private property and the public good from harm, many town decision-makers are recognizing that it is in their own economic and environmental self-interest to guide development near moving water. Allowing development too close to a waterway has too often led to damage or loss of roads and buildings, and pollution of the river, not to mention a growing threat to the rural character which is the signature of the Connecticut River Valley.

The flood and erosion “insurance” provided by a riparian buffer is all the more important now that weather patterns are taking a turn. Whether global climate warming is natural or human-induced, New England is seeing a definite shift toward heavy storms that deliver several inches of rain in a single day. Sturdy buffers are the best protection for private property. Smaller tributaries are just as important as the larger streams they supply. If land adjacent to small streams is altered to reduce its flood control function, the cumulative impact will result in worse flooding in the mainstem, even if mainstem flood plains are safeguarded against further development.

Development pressure inevitably means pressure on aquifers. Nature’s own water treatment facilities, riparian buffers help cleanse and recharge wells and groundwater supplies. They are a real bargain compared to a multi-million dollar piece of infrastructure.

Land conversion also brings traffic closer to waterways. In the upper Connecticut River Valley, roads and railroads often closely follow rivers and streams, pinching the riparian zone. These may have longer lasting impacts on riparian land than any other type of human land use.

Local officials can help by utilizing town wetland and zoning regulations to protect stream buffers in areas that have not yet been developed, and by encouraging buffer restoration in developed areas. Developers and property owners can help by maintaining or restoring adequate stream buffers before, during, and after construction.

**Riparian
buffers are
a river's
right-of-way.**

**Small streams
need buffers,
too.**

Rewards of Riparian Buffers

Economic services

- ❖ protect citizens against property loss through flood damage and erosion
- ❖ recharge aquifers
- ❖ protect quality of public drinking water supplies
- ❖ support the recreation and tourism industry
- ❖ support sustainable yields of timber

Social services

- ❖ protect clean surface water for public recreation
- ❖ protect prime agricultural soils from permanent loss through development
- ❖ provide natural fences, visual screens, and noise control
- ❖ provide outdoor laboratories for teaching and research
- ❖ offer places for camping, nature study, hunting and fishing
- ❖ improve air quality
- ❖ recycle nutrients
- ❖ trap heavy metals and toxins
- ❖ store excess sediments
- ❖ trap excess carbon dioxide

Biological services

- ❖ support predators of rodent and insect pests
- ❖ protect fish and wildlife habitat
- ❖ provide corridor for movement of wildlife



FIRST STEPS

Build public support and awareness by assembling citizens interested in their town's future who can offer experience in engineering, home building, and conservation issues. Look at existing local policy with both small streams and large rivers in mind: master plan, zoning ordinance, subdivision regulations, and site plan review. Consult your regional planning commission for expert advice, model ordinances, or an evaluation of how well streams and riparian buffers fare under your town's current zoning provisions.

Your regional planning commission can perform a build-out analysis to show the density and pattern of development that could occur under current zoning. This jump into the future can identify where adjustments should be made today to avoid an unwelcome tomorrow.

Develop guidelines that remain flexible to site-specific needs. There is no one-size-fits-all buffer width adequate to protect water quality, habitat, and human interests. These policies should establish a clear link between water quality protection and riparian buffers.

THE TOWN PLANNER'S TOOL BOX

MASTER OR TOWN PLAN

The entire community and its waterways will benefit from a natural resources inventory that includes streams, their flood ways, and flood plains, as well as the town's stated resource protection goals and objectives. Refer to the *Connecticut River Corridor Management Plan* for information. In Connecticut river front towns, this plan can be adopted as an adjunct to the master plan following a public hearing, in New Hampshire by vote of the planning board, and in Vermont by vote of the selectmen. This provides the footing for a zoning ordinance that will help the town protect its waterways, and can also help the town foster connections among conservation lands.

Stating the town's support of riparian buffers in the master plan, however, is only window dressing if the zoning ordinance does not back it up. Towns can also employ a number of non-regulatory tools for promoting buffers.

ZONING ORDINANCE

Don't prohibit development—guide its location. Apply shoreland and buffer guidelines on small streams as well as on larger rivers. Small streams are most vulnerable because they respond most dramatically to changes in adjacent land uses, tend to be located on the steepest sloping and erosion-prone lands, and often have the highest quality remaining habitat. The zoning ordinance can apply a shoreland protection overlay district to all year-round streams within its borders, with the guidelines that follow. To encourage use of the various shoreland conservation techniques presented below, allow them by right, rather than by special exception.

Shoreland conservation zoning is not a "taking"—because it doesn't reduce density.

Suggested allowable uses

Encourage agriculture and forestry, provided they use best management practices established by NH and acceptable management practices established by VT; parks, recreation areas with minimal structural development; non-motorized trails; utility transmission lines. Encourage passive use of land for recreation and nature appreciation. Maintain wetlands, flood plains, seeps, and bogs in their natural condition. Allow harvest of timber for firewood or commercial use, consistent with state forestry harvesting guidelines.

Suggested prohibited uses

All uses that present a higher potential for pollution: filling stations, car washes, junkyards, bulk fuel storage, truck terminals, any facilities handling hazardous material. Campgrounds other than dispersed forested tenting sites should be excluded because of their tendency toward deforestation and soil compaction. Towns may wish to guide use of ATVs and mountain biking to less sensitive locations since these higher impact uses can contribute to vegetation loss and erosion. Buildings that do not depend on proximity to water should be sited outside a riparian buffer.

Lot coverage

Discourage impervious surfaces. The quality of life in a stream goes distinctly downhill when its watershed reaches 10-15% of impervious cover. A stream whose watershed is more than 25% impervious can no longer support aquatic life. Encourage developers to use alternatives that allow rain and snowmelt to soak in rather than run off, including retention of open space. Reducing the overall area of impervious surfaces and suburban lawns by encouraging conservation zoning, which minimizes site disturbance, will result in a lower total volume of stormwater runoff. Manicured lawns might as well be green asphalt, since they shed most of the water that falls on them. Encourage developers to retain natural vegetation already at work protecting the town's waterways.

Lot size and density

Some communities have actually done away with minimum lot sizes in order to guide development away from a stream buffer or other sensitive land. Allow flexibility so that developers can establish the same number of lots on the parcel outside the riparian buffer as they would in a conventional cookie-cutter layout, considering the total amount of land that is high, dry, and flood-free. A community can even give density bonuses for land-conserving design, and density disincentives to actively discourage land-consuming layouts. Experience shows that the added value of open space for views and for passive and active recreation can balance and even outweigh the conventionally perceived lower value of smaller lots.

Minimum frontage and road setbacks

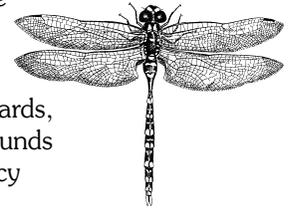
The larger these are, the more they tend to intrude on the riparian buffer. A flexible design should be allowed, even on small properties, when there is a possibility of increasing a riparian buffer. It is better to site a building closer to a road than to a stream.

Open space/cluster development

Cluster development concentrates construction on land with less conservation value, and allows owners of house lots in the development to share undivided ownership and enjoyment of the portion of the property remaining in a scenic and natural condition. This usually decreases the developer's costs for road and utility construction, and increases both the initial and the resale value of each lot, resulting in economic incentives for the developer and attraction to the buyer. The land can be managed by a homeowner's association, land trust, or the town.

Stream setback

The town can establish a riparian buffer similar to a utility right-of-way, whose width is determined before construction begins. Buffer averaging allows flexibility to account for the 100-year flood plain, steepness of slopes, adjacent wetlands, limited lot size, stormwater ponds, and pre-existing structures. The town can adopt the provisions of the NH Comprehensive Shoreland Protection Act for those waters not covered under the Act. On the mainstem of the Connecticut and its larger tributaries, towns should consider enacting stronger local protection that better reflects the flood and erosion potential of



Building on the 100-year flood plain is inherently unsafe.

these larger rivers. It is best to deter building on the 100-year flood plain; construction here is inherently unsafe.

Buffer Width Options

See *Introduction to Riparian Buffers*, No. 1 in this series, for more on buffer widths for various functions.

Fixed width — select a distance to protect most desired functions: for example, a 75' buffer for 1st and 2nd order (small) streams, 100' for 3rd and 4th order (medium-sized) streams, and 150' for large rivers, 5th order and higher. This is simplest to administer but will be more than adequate in some situations and inadequate in others.

Variable width — based on site-specific conditions such as slope and intensity of land use. Since every stream, parcel, and land use is different, buffers are better tailored to the land rather than to a cookie-cutter approach. While more science-based, this requires more site evaluation and is more difficult to administer.

Combination of the above — determine a standard width, and specify criteria for expanding or contracting, such as to include the 100-year flood plain, undevelopable steep slopes, and/or adjacent wetlands or critical habitats. For example, Weathersfield VT requires a 50' minimum buffer for land with 0-10% slope next to streams wider than 10', and adds 20' in buffer width for each 10% increase in slope.

Protected slope areas

Address slope gradient, soil erodability, and proximity to stream channels, since increasing slope results in a need for an increase in buffer width.

SUBDIVISION REGULATIONS

Map of existing resources & site analysis

The single most important document is a map prepared at the outset, showing

- ◆ streams, wetlands, and their buffers
- ◆ 100-year flood plains
- ◆ soil types and contours with areas of slopes over 15% indicated
- ◆ other valued natural resources such as farmland, aquifers and public water supply protection areas, woodlands, & significant wildlife habitat
- ◆ cultural resources such as historic/archeological features, and also views into and out of the site.

Information for this map is readily available, requires little or no cost or engineering except for the slopes and soils, and will form the basis for all the major design decisions. Much information can be gained from aerial photographs available from the county Natural Resources Conservation Service office.

Encourage a pre-application meeting and schedule a site visit early in the review process in order to discuss the conservation potential of the property and to help the developer save time and expense designing around it. This is a good opportunity to discuss the value of a riparian buffer and the reasons to keep existing vegetation.

Applicants should be asked to submit a lightly engineered sketch showing the maximum number of lots they could reasonably expect to gain under a conventional layout after discounting unbuildable land. This better reflects the development capacity of the property, and gives the developer and the town time to work together before investing in an engineered “preliminary plan.”

Then use the approach used by successful designers of golf course developments: locate house sites around the most valuable natural features just as one might around a fairway or putting green, keeping structures as far away from the stream as possible. Finally, align streets and trails, and draw in lot lines.

Wastewater management specifications

Include erosion and sedimentation control, stormwater management, landscaping, and provisions for special investigative studies. It is appropriate to incorporate the NH Comprehensive Shoreland Protection Act criteria here.

Road design specifications

Flexible road width dimensions will help make room for greater setbacks from streams.

**Urge
developers to
retain natural
riparian
vegetation.**

Drainage design specifications

Providing buffers should reduce the cost and size of stormwater detention basins needed on the site, freeing land and funds for other uses. Promote forested buffers as part of stormwater management planning and allow the pollution removal effectiveness of buffers to be credited in stormwater plans and calculations, but ensure that the size of the proposed buffer is adequate to handle the job. Criteria of state regulations such as NH RSA 483-B can be added as written after reviewing them for consistency with locally adopted language. Include sections on erosion and sedimentation control.

Innovative land use controls

The town can allow transfer of development rights from riverfront lands to other parts of town designated for more intensive development. This protects the property value of the riverfront land while keeping it on the job protecting the river.

A WORD ABOUT ARCHEOLOGICAL RESOURCES

Since stream corridors have been powerful magnets for human settlement throughout history, it is not uncommon for historic and prehistoric resources to be buried by sediment or obscured by vegetation along stream corridors. Contact the State Historic Preservation Office to identify any potential cultural resources before beginning work. If a site is uncovered unexpectedly, all activity that might adversely affect it must cease. The SHPO will determine the significance of the site and advise on how to proceed to avoid delay.

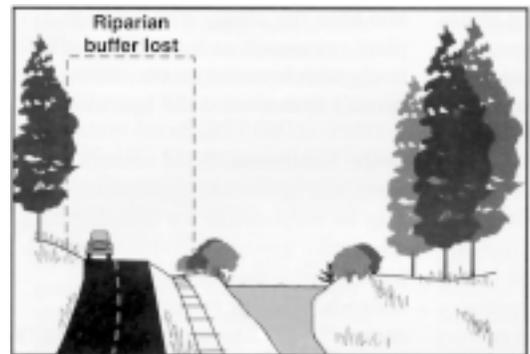
NON-REGULATORY OPTIONS FOR PROTECTING RIPARIAN BUFFERS

Encourage road agents to avoid mowing vegetation in riparian buffers where roads are close to streams. The often-too-small strip of grass, ferns, and other volunteer plants has a big job to do to keep trash, road pollutants, and sand out of the water.

Encourage the local conservation commission to educate townspeople about the value of buffers and the ways in which personal choices can have lasting effects, both good and bad, on the region's water resources. Let them know how unintentional encroachment such as dumping, understory removal, or altering drainage can reduce buffer function. Contact your county conservation district office to visit a riparian buffer demonstration site. Recognize landowners who do maintain buffers: designate "watershed friendly farms," make an annual award from the conservation district or conservation commission, and provide publicity.

Work with a local land trust to acquire development rights through purchased or donated conservation easements. The landowner continues to use and enjoy the land within the limits of the easement. An easement should include both the streambank and a buffer around it. Guidance on timber harvesting, land conversion, construction, or road building within the buffer can be written into the easement. This will run with the land forever, providing for continuity of management as owners change. A conservation easement need not require the landowner to provide public access, and it can offer significant tax advantages.

The town can also consider providing property tax incentives for landowners who set aside buffers, and can acquire especially sensitive waterfront lands for public space, perhaps using funds from the Land Use Change Tax.



EXISTING STATE & LOCAL REGULATIONS

Since riparian buffers are among the very best ways to protect both private property and the quality of rivers and streams, state and many local authorities have taken steps to protect them. In both Vermont and New Hampshire, septic systems must be set back 75' from rivers and streams, and many municipalities also have setbacks for structures. Some require vegetated buffers of a standard width, while others prescribe a range and assign a width appropriate to the site, often based on slope.

New Hampshire: The Comprehensive Shoreland Protection Act (RSA 483-B) protects existing natural woodland buffers within 150' of the public boundary line on 4th order streams, including lower portions of the Ashuelot, Ammonoosuc, Cold, Gale, Israel, Mascoma, Mohawk, Sugar, Little Sugar, and Upper Ammonoosuc Rivers, and the lower parts of Mink, Partridge, and Stocker Brooks. On these waterways, not more than 50% of the basal area of trees and a maximum of 50% of the total number of saplings can be removed in a 20-year period. A healthy, well-distributed stand of trees, saplings, shrubs, and ground covers and their living, undamaged root systems must be left in place. RSA 483-B does not protect smaller streams. While the Connecticut River mainstem was also exempt from this law at the time of printing, its provisions may apply in the future.

While forestry is exempt from RSA 483-B, the Basal Area Law (RSA 227-J:9) requires that within 150' of 4th order streams and great ponds, 50% of the pre-harvest basal area must be maintained, and that 50% of the preharvest basal area must be maintained within 50' of all perennial streams, rivers, and brooks.

Vermont: *There is no shoreland protection law in Vermont as of this writing.* The Agency of Natural Resources has adopted a Buffer Procedure pursuant to 3 V.S.A. § 835 which is not a rule or regulation, but may be used as guidance in conditioning permits. *The Manual of Acceptable Management Practices* for forestry specifies that except for stream crossings, a protective strip shall be left along streams in which only light thinning or selection harvesting can occur, so that breaks made in the canopy are minimal and a continuous cover is maintained. Log transport machinery must remain outside a 25' margin along the stream. Including this 25' margin, the width of the protective strip shall be 50' for land sloping 1-10%, adding another 20' for each additional 10% increase in grade.

FURTHER READING

- The Connecticut River Corridor Management Plan*, Connecticut River Joint Commissions, 1997. Copies of this plan were provided to each member of the board of selectmen, planning board/commission, and conservation commission of the 53 NH & VT riverfront towns, and to each town's library, school, and historical society. It is also available on the Web (www.crjc.org).
- Buffers for Wetlands and Surface Waters: A Guidebook for NH Municipalities*, Chase, Deming, & Latawiec. Audubon Society of NH, NH Office of State Planning, NRCS, UNH Cooperative Extension, 1997
- A Guide to Developing and Re-Developing Shoreland Property in New Hampshire*, North Country Resource Conservation & Development Area, 1999.
- Stormwater Management and Erosion and Sediment Control Handbook for Urban and Developing Areas in NH*. NH Department of Environmental Services, 1992.
- Growing Greener — Putting Conservation into Local Plans and Ordinances*, Randall Arendt. Island Press, Washington DC, 1999.
- Dealing with Change in the Connecticut River Valley: A Design Manual for Conservation and Development*, Center for Rural Massachusetts. Lincoln Institute of Land Policy & the Environmental Law Foundation, 1988.
- Natural Resources: An Inventory Guide for New Hampshire Communities*, Upper Valley Land Trust & UNH Cooperative Extension Service, 1992.
- Watershed Guide to Cleaner Rivers, Lakes & Streams*, Brian Kent. Connecticut River Joint Commissions, 1995

Wildlife illustrations by New Hampshire naturalist David M. Carroll

Fact sheets in the series **Riparian Buffers for the Connecticut River Watershed**

- No. 1 Introduction to Riparian Buffers
- No. 2 Backyard Buffers
- No. 3 Forestland Buffers
- No. 4 Buffers for Habitat
- No. 5 Buffers for Agricultural Land
- No. 6 Urban Buffers
- No. 7 Guidance for Communities
- No. 8 Planting Riparian Buffers (& plant list)
- No. 9 Field Assessment
- No. 10 Sources of Assistance

See also the companion series for land owners:

The Challenge of Erosion in the Connecticut River Valley, Connecticut River Joint Commissions, 1998.

Part of the **Living with the River** series. May be reprinted without permission.

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