

R I V E R

B A N K S &

B U F F E R S

No. 3



Forestland Buffers

for the Connecticut River Watershed

Forests in northern New England are still the best possible cover for the rivers running through them. Fishermen, swimmers, boaters, and birds all have a stake in decisions made by forest land owners about the streams that run through their property.

Forest managers have known for some time the many reasons to include riparian buffers in their forest plans. Buffered streams are a good advertisement for the quality of a forester's work and a landowner's care for the land. Streams guarded by healthy riparian buffers run clearer, cleaner, and cooler, offer better fishing, and are more stable. Their banks provide homes and highways for wildlife.

No stream is too small to benefit from a buffer on its banks. In fact, the smaller the stream, the more good a buffer will do. It is, after all, those many little streams that make up the mighty Connecticut.

No stream is too small to benefit from a buffer.

The Problem

Streams can suffer from a logging job when silt from poorly planned logging roads, landings, and skid trails is washed into the water or heavy equipment crosses the stream without care. Petroleum products, pesticides, or other chemicals used on the job can poison the water. The loss of forest cover means warmer water that holds less oxygen for fish, and faster runoff in a heavy rain.

BUFFER BENEFITS

Forest vegetation along streambanks provides a "living filter" for both surface and subsurface water running off the land, trapping sediment, nutrients, chemicals, and other pollutants. Roots help hold the soil and control erosion.

Keeping a forested buffer along a stream is also the key to prime fish habitat both at home and in the river beyond. Insects, the favorite food of trout, are abundant in waters shaded and fed by the leaves and twigs of streamside forests. Streams flowing through older, more complex forests provide the most bountiful buffet for trout. Woody debris helps create plunge pools, riffles, and gravel beds. Fallen logs provide cover for fish to rest and hide from predators. Streamside forests capture rainfall better than any other land use, preventing flooding and recharging groundwater so the stream doesn't dry out in summer.

Forested streamside buffers are home to more species of wildlife than any other type of environment. Bald eagles are nesting in the Connecticut River Valley once again, and the range of osprey is also expanding. Large trees along the river provide perching and potential nesting sites for eagles, osprey, and some aquatic birds. Insect eating birds, the landowner's ally against insect pests, also find cover in a forested buffer.

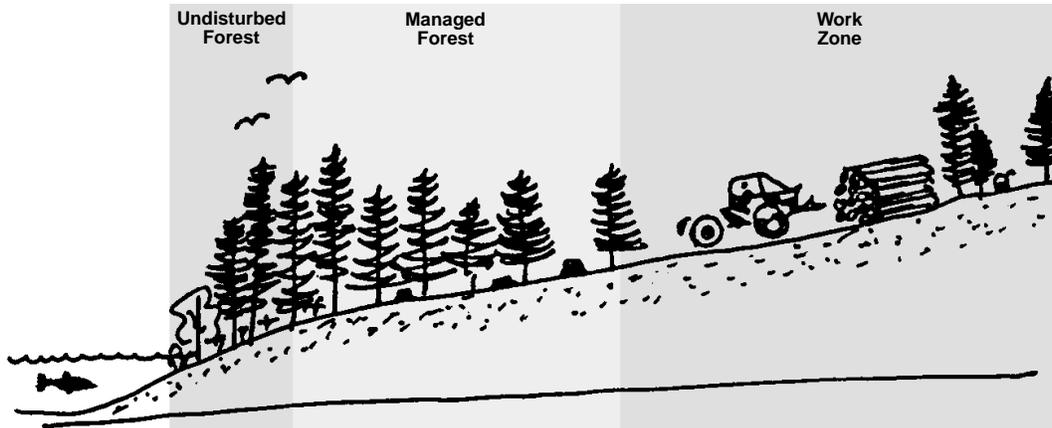
Buffers can be an asset to the pocketbook as well as the environment. Forest management is compatible with maintaining functioning riparian forest buffers. Buffer plants can provide not only timber, wood fiber, and Christmas trees, but also nuts or horticultural or even pharmaceutical products. For example, grape vines can be made into wreaths, birchbark is in increasing demand for rustic home accessories, and alder cones make miniature Christmas decorations. And, there's nothing like the deep woods for hiking, birdwatching, fishing, hunting, snowshoeing, and watching wildlife along a brook or river.

Good buffers mean better fishing.

ANATOMY OF A RIPARIAN BUFFER

The Three-Part Forested Buffer System:

1. **Undisturbed Streamside Forest**
2. **Managed Forest**
3. **Outer Work Zone**



Undisturbed trees shade stream and help stabilize bank; natural woody debris improves fish habitat.

Forest with long-term rotation; soils and natural litter remove nitrogen, promote infiltration of water; trees use excess nutrients for growth; wildlife habitat.

Managed forest or open area. Spreads surface water flow before it enters the middle zone.

A Word on Width

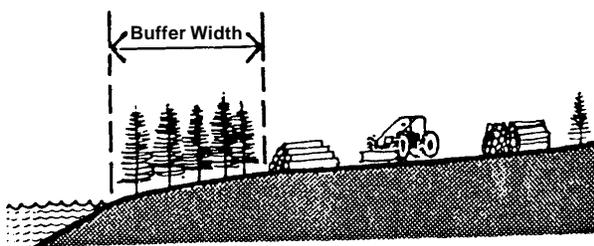
There is no one buffer size that fits all streams (See *Introduction to Riparian Buffers*, No. 1 in this series, for more on buffer width.) On tiny streams, one tree's depth is enough to shade the stream and keep it cool, although it doesn't do much to capture sediment or soak up a downpour. Bigger buffers are better for:

- thinner or poorly drained soils
- steeper slopes
- north-facing watersheds
- meandering streams
- forests dominated by softwoods
- streams with high pre-harvest flow
- harder working land
- larger streams.

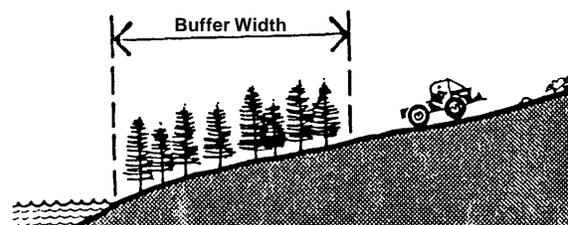
The NH Forest Sustainability Standards Work Team recommends 100' for 1st and 2d order streams, 300' for the bigger 3rd order streams, and 600' for the even larger 4th order streams. The first 100-150' scrubs runoff and the rest improves habitat. Land-owners interested in non-timber values will want to consider a wider no-harvest zone next to the stream.

A buffer is a right-of-way for a stream.

Steeper slopes mean wider buffers.



10% Slope



20% Slope

MANAGEMENT

Follow Vermont's *Acceptable Management Practices* or New Hampshire's *Best Management Practices*.

Undisturbed Streamside Forest

Leave naturally occurring instream woody debris undisturbed to create pools and provide cover and shade for fish.

- ✿ remove a natural snag only if it clearly represents a flood hazard
- ✿ cut only large leaning trees which threaten to pull their roots into the water. Leave the root systems intact. Remove disease- or insect-infested trees.
- ✿ limit stream crossings
- ✿ keep slash and other logging debris out of the stream
- ✿ an extremely high value tree may be removed where water quality will not be affected
- ✿ exclude livestock from the buffer except for designed stream crossings

Managed Forest

Practice timber stand improvement beyond the streamside zone to maintain vigorous growth and remove nutrients and pollutants captured in wood, while maintaining shade levels and production of detritus.

- ✿ use small scale harvesting — single tree or small group cuts; avoid whole tree harvesting
- ✿ use long rotations to develop older, uneven-aged stands with 70% crown closure, and feather the edge to avoid exposing streambank trees to blowdown
- ✿ disturb the duff layer as little as possible
- ✿ control channelized flow and erosion up slope; encourage dispersed runoff
- ✿ for heavier sediment and pollutant loads, manage to increase roughness of forest floor and/or increase width of buffer
- ✿ retain trees that take up excess nutrients: oak, basswood, red maple
- ✿ consider using vegetable-based, biodegradable oils and lubricants after checking equipment warranties. These oils are virtually non-toxic to fish. Fill or maintain machinery well away from a stream.
- ✿ monitor for erosion before, during and after harvesting. Look for cloudy water, algae growth, deposits of silt or muck on gravel streambeds, and new runoff channels or gullies.
- ✿ avoid using pesticides near water

Well-buffered waterways show the public that timber management and beautiful, clean streams can go together.

PLANNING A HARVEST WITH BUFFERS IN MIND

Cruising the land in spring allows a landowner to flag vernal pools and brooks that might dry out and escape notice by fall. A forester or other qualified professional can help with wetland identification. Consider working with a professional forester to prepare a forest management plan that includes an effective stream buffer. He or she will help you apply for any necessary wetlands permits well in advance.

Plan roads and skid trails to limit stream crossings to an absolute minimum. Locate log landings or haul roads outside the riparian area, or at least 200' from the stream. Be aware of aquifers, wells, and public water supplies that harvesting may influence. Avoid running pathways and skid trails directly downslope. Turn drainage ditches into the woods away from the stream buffer, rather than toward the stream.

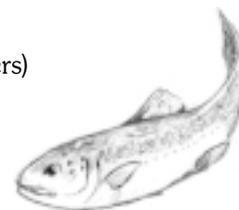
Operating timber harvests in late summer or on frozen ground minimizes disturbance to forest floor and understory vegetation, and avoids conflicts with wildlife breeding (April–June). In places with potential for recreational use, consider establishing well-defined trails. Use fencing, marker posts, marker boulders, and signs to guide trail traffic and prevent intrusion by equipment.

Arrange for a signed contract with the logger which includes these specific terms.

SAFEGUARD SPECIAL FEATURES

Identify and protect natural features valuable to wildlife, such as:

- large dead and dying standing trees (nesting, roosting for hawks, osprey, and eagles)
- large cavity trees (nesting by owls, wood ducks, hooded mergansers & others)
- seasonal pools (used by amphibians for breeding)
- stone walls and rock piles (snakes and small mammals)
- large trees overhanging the water (feeding perches for kingfishers, osprey, others)
- large stands of conifer trees (used by deer as wintering areas)
- hollow trees and logs (suitable as dens for some mammals)
- shaded fallen logs (preferred habitat for some salamanders)



KNOW STATE AND LOCAL REGULATIONS

NEW HAMPSHIRE: While forestry is exempt from the Comprehensive Shoreland Protection Act (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 also within 50' of other perennial streams, rivers, and brooks. Fourth order streams in the Connecticut River watershed of NH include the lower portions of the Ashuelot, Ammonoosuc, Cold, Gale, Israel, Mascoma, Mohawk, Sugar, Little Sugar, and Upper Ammonoosuc rivers, and Mink, Partridge, and Stocker brooks, and the Connecticut River itself.

VERMONT: *The Manual of Acceptable Management Practices* 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 25' away from the stream. Including this 25' margin, the width of the protective strip shall be 50' for land sloping 1-10%, adding 20' for each additional 10% increase in grade.

LOCAL: Many towns have their own local zoning ordinances for buffers and setbacks from surface waters. If you are unsure what laws apply to your land, contact your town office.

REFERENCES

- Best Management Practices for Erosion Control During Trail Maintenance and Construction.* NH Department of Resources and Economic Development, 1994.
- Best Management Practices for Erosion Control on Timber Harvesting Operations in New Hampshire.* NH Department of Resources and Economic Development, 1990.
- Good Forestry in the Granite State: Recommended Voluntary Forest Management Practices for New Hampshire.* NH Forest Sustainability Standards Work Team, 1997.
- Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont.* VT Department of Forests, Parks & Recreation, 1987.

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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