

Better Buffers *for the* Batten Kill

A RIVER *at* RISK

By 1850, when the number of sheep in the watershed was at its peak, much of the land drained by the Batten Kill had been cleared. Valley crop lands and hillside pastures replaced pre-settlement forests, some as high up the mountains as 2,400 feet. The effects on water quality and aquatic life must have been huge.

To a lesser extent, clearing right along the Batten Kill and its tributaries continues today. Though forests have reclaimed once treeless hillsides, the corridors along the river and its tributary streams are only slightly more wooded than in 1850. Agricultural fields, golf courses, lawns, and parking lots are usually separated from the river by a band of trees and shrubs only a few feet wide, or by only a grassy strip. The result is a river system that is still at risk.

Batten Kill watershed residents can change this, simply and inexpensively, by creating vegetated streamside buffers.

B E T T E R B U F F E R S F O R

A Bounty of Benefits

A vegetated buffer on both sides of the watercourse will do more to restore, promote and protect the health of the Batten Kill and its tributary streams than any other one thing landowners, municipalities, or state or federal agencies in the watershed can do. Here's why:

- **Buffers trap sediments before they enter a stream.**

By altering the characteristics of the stream bed, deposits of fine sediments can lead to a change in aquatic plant communities and the organisms that depend on them. Fine sediments can smother aquatic insects, fish and fish eggs, and other organisms. And they can compact the stream bed in such a way that trout and other fish are unable to spawn successfully.

- **Buffers reduce erosion by keeping banks stable.**

The roots of trees and shrubs bind together the thin layer of mineral soils along the headwater streams in the watershed and the loose alluvial soils of the floodplain, helping to hold banks in place. Eroding and slumping banks are a source of sediment contamination in themselves. They also lead to wider, shallower and warmer channels. Most Batten Kill organisms, such as its renowned trout, are creatures of clear, cold water.

- **Buffers remove some nutrients and other contaminants before they reach the stream.**

Wide vegetated buffers can intercept nutrients such as nitrogen and

phosphorus applied to crop land in the forms of manure or fertilizer or in fertilizers applied to lawns. Buffers can also remove pesticides in lawn run-off and oils and other chemicals in stormwater run-off from parking lots before those contaminants reach the stream channel itself.

- **Buffers improve and protect aquatic habitat.**

Trees and shrubs along the Batten Kill and its tributaries help shade the streams and keep them cool. Their annual fall "crop" of leaf litter, much of which falls into the streams, is an important source of food for many different aquatic organisms. Terrestrial insects falling from overhanging branches are food for trout and other fishes. Fallen tree stems and branches or "large woody debris" is a crucial source of cover for Batten Kill trout and of food and cover for other aquatic creatures.

- **Buffers greatly improve terrestrial habitat.**

Riparian zones are among nature's "edges" and, like all such edges, are unusually biologically rich and often diverse, supporting populations of animals that may be uncommon elsewhere. Warblers and other migratory songbirds, mink, otter, reptiles, and amphibians are a few of the species that will make use of undisturbed wooded buffers. Buffers can also serve as wildlife corridors for animals moving from winter to summer grounds or to and from breeding territories.

Wide Works Best

A typical Batten Kill buffer zone is only one or two trees wide – not wide enough!

Some studies suggest that the entire 100-year floodplain be set aside as a buffer zone, as has been done in some National Forests where logging activities would otherwise threaten water resources.

Biologists interested in protecting and providing fish habitat found that a buffer zone as wide as three tree lengths is needed to supply the watercourse with sufficient large woody debris and to protect trees in the buffer from high winds.

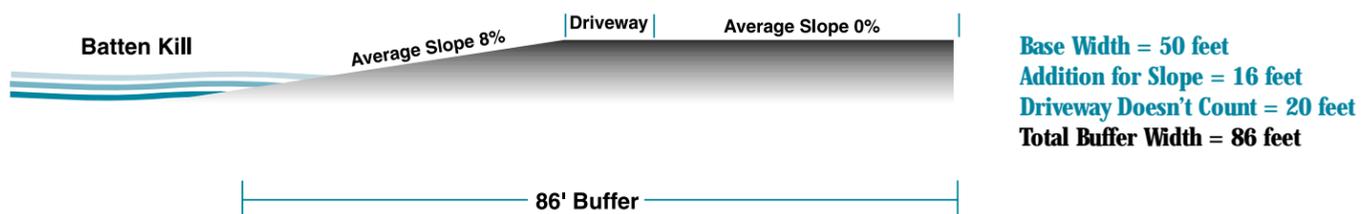
Other studies concluded simply that a 100-foot buffer will adequately protect water quality and aquatic habitats.

A more practicable suggested buffer width – one also supported by research – ties width to slope, recognizing that run-off moves much more quickly and with greater destructive power over steep ground compared to level surfaces.



FOR THE BATTEN KILL

Computing a Better Buffer



All the basic buffer "services" are provided when a buffer has a base width of 50 feet, plus 2 additional feet for every one percent of slope in the buffer zone.

Roads, impervious surfaces such as driveways and rooftops, and slopes greater than 25% don't count toward the recommended buffer width.

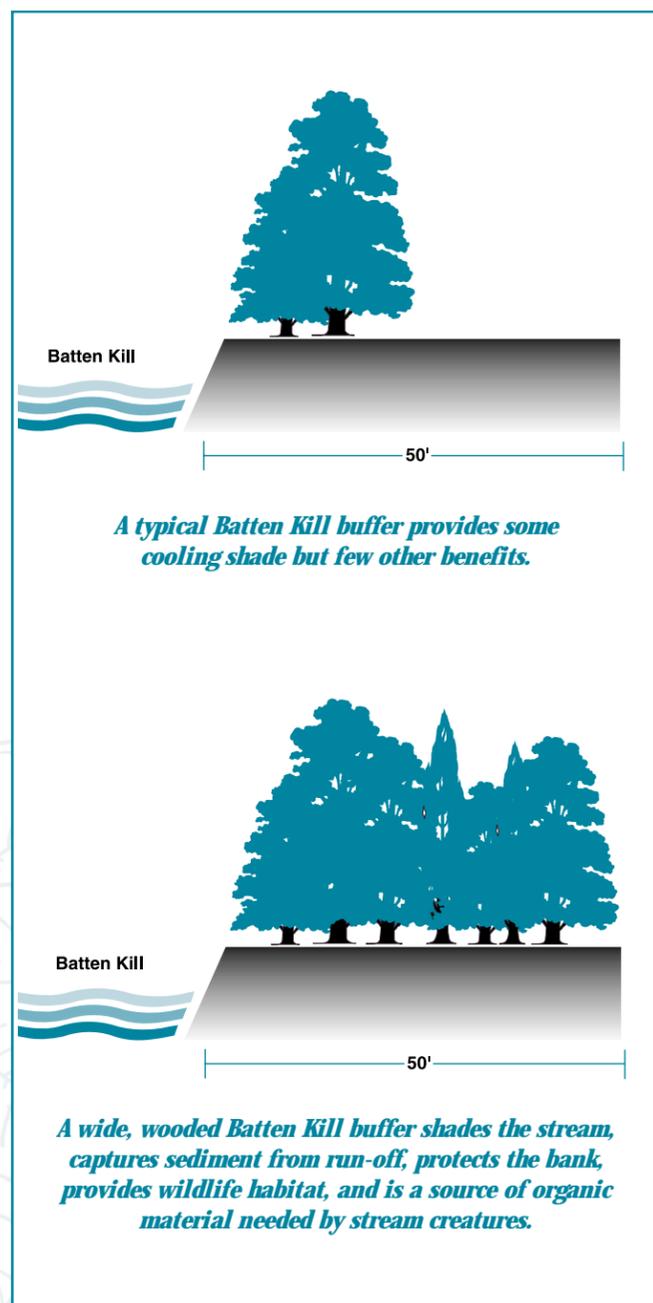
What "Vegetated" Means

Some landowners and farmers in the watershed grow grass or hay right to the river's edge. But only forested buffers – green corridors planted with native trees and shrubs – protect streambanks and provide a full range of buffer benefits.

- Forested buffers are most effective in trapping sediment in run-off and in stabilizing banks. Grasses are quickly overwhelmed by sediments and offer little protection against bank erosion.
- Forested buffers remove nitrogen (but not phosphorus) more effectively than grasses and seem to capture pesticides as efficiently as grasses.
- Unlike grassed strips, forested buffers provide shade, woody debris, food for fish and other aquatic creatures, and habitat for a variety of wildlife.

A Note

Phosphorus is a problem in the watershed where run-off is contaminated with manure or lawn fertilizers. In those locations, the ideal buffer will include an additional grassy strip adjacent to the forested zone on the landward side of the buffer. Grasses take up phosphorus efficiently, and they (and the phosphorus they've taken up) can be cut and removed from the floodplain. Unless plants are removed, soils can become saturated with phosphorus and begin leaking the nutrient to the watercourse. Phosphorus is the usual suspect in algal blooms in rivers and lakes.



What You Can Do

- Lay out a buffer along your Batten Kill stream bank 50 feet wide plus 2 feet for each percent of slope. Impervious surfaces such as roads and driveways shouldn't be included in computing buffer width.
- Plant trees and shrubs in the buffer zone where there are none, at a density of about one plant every ten feet or about sixty plants per 500 square feet (a U.S. Fish & Wildlife standard). Use native plant species. The Batten Kill's aquatic and terrestrial creatures are adapted to them – to their habits of growth, their time of leaf fall, and the chemical compounds they contain.
- Where manures are used in the floodplain, supplement the planting with an additional strip of perennial grasses outside the landward edge of the buffer zone. Cut and remove the grass crop once every one to three years, after spring floods. Do not mow within the buffer zone!
- Keep contaminants out of the buffer zone and avoid activities in the zone that threaten the river. No livestock, no septic leach fields, no construction activities, no earth disturbances.
- Any break in the buffer is a potential entry point for sediments and contaminants. Discharge drainage ditches, roadway run-off, and culverts to a settling area in the buffer, not to the stream.
- Control run-off from impervious areas on your property and reduce non-porous surfaces altogether.

Commercially Available Native Trees and Shrubs of the Batten Kill Watershed

For Upland Tributaries:

Balsam fir	Serviceberry
Canadian hemlock	Sugar maple
Mountain ash	White birch
Nannyberry	

For Downstream Floodplains:

American highbush cranberry	Red maple
Black cherry	Silky dogwood
Basswood	Speckled alder
Butternut	Sycamore
Elderberry	White ash
Red-stemmed dogwood	Winterberry

The Batten Kill Buffer Outreach Program is a project of the Bennington County Conservation District, the Southwestern Vermont Chapter of Trout Unlimited (TU), national Trout Unlimited's Embrace-a-Stream program, and the U.S. Fish & Wildlife Service, Partners for Fish & Wildlife program. It was made possible by funding from the Vermont Conservation License Plate program and the U.S. Forest Service, Green Mountain National Forest. Design services were contributed by TU member Joe Carabello and CPR/ Communications (www.cpronline.com). Production costs for brochures for residents of the New York portion of the watershed were covered by the Battenkill Conservancy-NY.



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