Vermont Legislative Research Shop

Waterfront Buffer Zones

Riparian buffers are vegetated zones of land adjacent to water sources. Preservation and reestablishment of these zones can have many environmental benefits. The most important function of these zones is to act as a filter for water flowing into the water source, and studies show that they greatly reduce water pollution. The vegetation and soil absorb runoff water that is often laden with pollutants, sediments and nutrients that are harmful to the water supply, especially if the buffer zone is over 30 feet wide.[1] The absorption of runoff water has other benefits: it recharges the ground water supply, and can regulate water flow in rivers and therefore reduce and prevent flooding. Having vegetation immediately adjacent to a water source also helps control erosion, as the roots of the plants help hold soil in place. Zones of land adjacent to water sources are often flourishing wildlife habitats, with many species depending on them for survival.[2] Buffer zones could also theoretically reduce the amount of public spending on storm water management and pollution removal.[3]

Many levels of government in the U.S. have mandated the creation/maintenance buffer zones in which construction and other environmental disturbances are prohibited. The difficulty in legislating the creation or preservation of these zones lies in balancing the interests of landowners with the interests of those seeking to improve water-quality.

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[1] Belt, G.H., J. O'Laughlin, and T. Merrill, "Design of forest riparian buffer strips for the protection of water quality: analysis of scientific literature" *Idaho Forest, Wildlife, and Range Policy Group Report No. 8*, University of Idaho, Moscow, ID, 1992; Johnson, A.W., and D.M. Ryba, "Literature review of recommended buffer widths to maintain various functions of stream riparian areas" Water and Land Resources Division, King County Department of Natural Resources, Seattle, WA, 1992; Castelle, A.J., A.W. Johnson, and C. Conolly, "Wetland and stream buffer size requirements – a review" *Journal of Environmental Quality* (1994) 23:878-882; Fennessy, M.S., and J.K. Cronk, "The effectiveness and restoration potential of riparian ecotones for the management of nonpoint source pollution, particularly nitrates" *Critical Reviews in Environmental Science and Technology* (1997) 27:285-317; Christensen, D. "Protection of riparian ecosystems: a review of the best available science" Jefferson County Natural Resources Division, Port Townsend, WA, 2000; For more information see: Canfield, Timothy J., Mayer, Paul M. McCutchen, Marshall D. Reynolds, Steven K. Jr., "Riparian Buffer Width, Vegetative Cover and Nitrogen Removal Effectiveness: Review of Current Science and Regulations" U.S. Environmental Protection Agency, Office of Research and Development, National Risk Management Research Laboratory, Ada, Oklahoma, 2005, Retrieved April 9, 2008 from www.epa.gov/nrmrl/pubs/600R05118/600R05118.pdf.

[2] Hawes, Ellen, Smith, Markelle, "Riparian Buffer Zones: Functions and Recommended Width" Yale School of Forestry and Environmental Studies, Prepared for the Eightmile River Wild and Scenic Study Committee, April, 2005, retrieved March 31, 2008 from http://64.233.169.104/search?q=cache:5OqTzrid3tsJ:www.eightmileriver.org/resources/digital_library/appendicies/09c3_Riparian%2520Buffer%2520Science_YALE.pdf+riparian+buffers,+new+england&hl=en&ct=clnk&cd=6&gl=us&client=safari .

[3] Presler, Henrietta H., "Successful Implementation of Riparian Buffer Zones," *Stormwater*, December 2005, retrieved March 31, 2008 from http://www.gradingandexcavation.com/sw_0611_successful.html.

Buffer Width

Scientists disagree over the optimal width for riparian buffer zones, but it seems clear that different water sources have different needs. Three factors influence ideal buffer widths: slope, soil type, and vegetation mix. A buffer with a steep slope needs to be wider because the water will rush over it faster, giving it less time to be absorbed. The type and density of soil also affects the speed of absorption. The type of vegetation in the buffer is perhaps most important--buffers with a wide variety of vegetation types (trees, grasses, bushes, etc.) will absorb more nutrients than buffers with just one type of vegetation.[4]

It is impossible to generalize ideal buffer zone widths due to the individual needs of specific streams, but the following are some guidelines from various scientific studies. Most studies find that buffers between 30 and 150 feet are highly effective.[5] Several studies found that narrower buffer zones of around 15 feet still reduced subsurface nitrate flows by up to 80%, but were less effective in reducing surface nitrogen and other pollutants.[6] Another review of the scientific literature found that most studies demonstrate significant nutrient removal in buffers more than 90 feet wide, but that "these buffers are much wider than what land managers can typically expect farmers to remove from active production".[7]

H. 549 in the Vermont House during the 2007-2008 Legislative Session sought to establish a minimum statewide riparian buffer zone. The bill would require the establishment of a 50 foot buffer zone along the lakes and streams of the state.[8] The bill would allow for some exceptions, and local governments would be free to create wider buffers for specific water sources.

Other States' Laws

Georgia

Georgia's Conservation and Natural Resources Act of 2007 mandates that "a natural vegetative buffer area shall be maintained for a distance of 100 feet on both sides of the stream as measured from the stream banks." The act requires local governments to map the areas surrounding rivers