



# Guidance for Communities

in Northern New Jersey Watersheds

*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 community policy.*

## THE CHALLENGE

The high quality of life offered in the watersheds of northern New Jersey along with the waters clean and attractive appearance, 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.

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 Jersey 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 northern New Jersey, 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 implementing land development 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.

### **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

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

**Small streams  
need buffers,  
too.**

### *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 local environmental commission or watershed association for expert advice, model ordinances, or an evaluation of how well streams and riparian buffers fare under your town's current zoning provisions.

Communities in the Upper Delaware Watershed Management Area should review the riparian health assessment completed for their watershed to determine the extent and current health of their riparian resources. This assessment can provide guidance on where existing buffer areas can benefit from enhancement or expansion.

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 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. The Master Plan provides the footing for a zoning ordinance that will help the town protect its waterways. New Jersey's Municipal Land Use Law (MLUL) provides guidance on the preparation and contents of a community Master Plan. Issues related to riparian areas should be articulated as part of the communities' statement of objectives and principles. The Land Use Plan Elements should describe the function, value and extent of riparian areas in the community. Additionally a community can define riparian area protection, enhancement and management issues in the Conservation Plan Element of their Master Plan.

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**

Zoning ordinances don't prohibit development—they guide its location. Apply shoreline and buffer guidelines on small lakes & ponds, 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 shoreline protection overlay district to all year-round streams within its borders, with the guidelines that follow. To encourage use of the various shoreline 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.**

## **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.

## **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
- ◆ Location and type, age and health of the existing vegetation
- ◆ 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 will form the basis for all the major design decisions. Much information can be gained from aerial photographs available from your local 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 plot 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**

New Jersey Chapter 199 which regulates the site evaluation and location of septic system has a 50-foot minimum between a septic disposal field and a watercourse. Executive Order 109 gave DEP the authority to require alternative analyses to be conducted prior to the Department's making a final decision on an application for approval of a wastewater management plan or amendment thereto or an application for approval of a water quality management plan or amendment. The analysis must include an evaluation of depletive and consumptive water use, detailed land use, environmental build-out and pollutant loading.

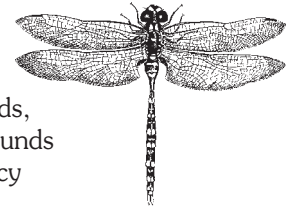
**Urge  
developers to  
retain natural  
riparian  
vegetation.**

### ***Suggested allowable uses***

Encourage agriculture and forestry (provided they use best management practices established by the Natural Resources Conservation Service, NJ Bureau of Forestry, Rutgers Cooperative Extension), parks, recreation areas with minimal structural development; non-motorized trails in riparian areas. 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: gas 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 usually 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 adopted lot size averaging 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. A homeowner's association, land trust, or the township can manage the land.

### ***Stream setback***

A municipality can establish a riparian buffer, whose width is determined by ordinance 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. New Jersey Department of Environmental Protection has been encouraging a minimum 75 feet from the top of the stream bank to reduce the impacts of development.

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

### ***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. New Jersey Department of Environmental Protection revised Manual for NJ: Best Management Practices for Control of Nonpoint Source Pollution from Stormwater provides guidance for the development of local regulations. Impacts to riparian areas can also occur from the placement of stormwater management structures. All detention basins, stormwater outfall pipes and storm water infrastructure should be kept at least 75 feet from the stream bank to maintain the integrity of the riparian area.

### ***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.

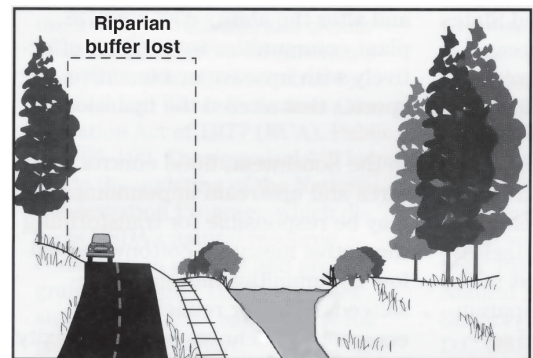
## **NON-REGULATORY OPTIONS FOR PROTECTING RIPARIAN BUFFERS**

Encourage road departments 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 sediment out of the water.

Encourage the local environmental commissions and watershed associations 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 soil conservation district office, local watershed associations or visit the North Jersey RC&D web page ([www.northjerseyrcd.org](http://www.northjerseyrcd.org)) for locations where you can see a riparian buffer demonstration site. Acknowledge landowners who maintain buffers: designate "watershed friendly farms," make an annual award from the conservation district or environmental 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.

Townships can acquire especially sensitive streamside lands for public space, perhaps using funds from Green Acres open space or local open space funding.



## EXISTING STATE 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 New Jersey, septic systems must be set back 50' 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.

The New Jersey Municipal Land Use Law under 40:55D, 93-99 articulates the role of towns in developing and implementing storm water control ordinances and plans. Additionally all construction projects that disturb more than 500 square feet of land are required to develop and receive approval of a soil erosion and sediment control plan pursuant to the NJ Soil Erosion & Sediment Control Act. These plans focus on reducing the impacts that silt-laden stormwater causes to our streams. Freshwater wetland areas along riparian corridors also receive protection through the NJ Freshwater Protection Act. Wetland areas can receive a wetlands buffer area to mitigate development impacts based on the resource value of the development. One provision prohibits the disturbance of existing vegetation within 25-50 feet from the top of the stream channel bank.

*Wildlife illustrations by New Hampshire naturalist David M. Carroll*

### FURTHER READING

*Chesapeake Bay Riparian Handbook: A Guide for Establishing and Maintaining Riparian Forest Buffers*, USDA Forest Service Northeastern Area State and Private Forestry, May 1997. NA-TP-02-97

*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.

*Riparian Forest Buffers: Function and Design for Protection and Enhancement of Water Resources*. David Welsch, USDA Forest Service, Radnor PA NA-PR-07-91 [http://www.na.fs.fed.us/spfo/pubs/n\\_resource/buffer/cover.htm](http://www.na.fs.fed.us/spfo/pubs/n_resource/buffer/cover.htm)

*Riparian Zones in the Upper Delaware Watershed: A Technical Report for the Upper Delaware Management Project*. North Jersey Resource Conservation & Development, New Jersey, April 2002, posted on [www.upperdelaware.org](http://www.upperdelaware.org)

*Revised Manual for New Jersey: Best Management Practices for Control of NPS Pollution Draft*, May 3, 2000. NJ Dept. of Environmental Protection, [www.state.nj.us/dep/watershedmgt/bmpmanual.htm](http://www.state.nj.us/dep/watershedmgt/bmpmanual.htm)

### Fact sheets in the series *Riparian Buffers for Northern New Jersey*

- 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



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