STROUD
WATER RESEARCH CENTER

Research FROM THE FIELD

STROUD CENTER STUDY SHOWS VALUE OF STREAMSIDE TREES

In a study conducted on the Birch, Doe, and Buck & Doe runs, as well as 13 other streams in eastern North America, a multidisciplinary team of researchers, led by scientists from the Stroud Water Research Center, has discovered that streamside (or riparian) forests play a critical role in cleaning up our streams and rivers. The study, whose findings were recently published in the prestigious *Proceedings of the National Academy of Sciences,* demonstrated that not only do trees keep pollutants out of streams, they also help process those that are in them.

The Stroud Center team found that stream sections flowing through forested areas are wider and shallower than those in meadowlands, their beds are rougher and have more habitat, and water moves more slowly through them. These factors, along with other riparian forest benefits, such as a greater variety of organic food and more natural temperature patterns, produce a richer and more natural ecosystem than is found in deforested streams – and one that is far better able to process pollutants in their waters.

The implications of these findings are potentially enormous because they indicate that restoring riparian areas to their natural forested state is both an effective and a cost-effective way of protecting the world's fresh water. Over the course of the last century, public policies aimed at providing sufficient and clean fresh water have primarily focused on massive and expensive engineering projects, such as dams and filtration plants; and they have rarely addressed the accelerating deforestation across the country and around the world.

In doing so, such policies have overlooked – and often actually destroyed – the substantial benefits that nature provides free of charge. Perhaps nowhere is the value of such "ecosystem services" more evident than in streams and rivers, where hundreds of trillions of tiny organisms work constantly to clean the water.

> The implications…are enormous, for forested streams will deliver cleaner water to downstream rivers, estuaries and, ultimately, oceans.

Because the Stroud Center's study was conducted on small streams, which comprise more than 90 percent of all streams in the United States, the implications for improving water quality by planting trees along stream banks are enormous, for forested streams will deliver cleaner water to downstream rivers, estuaries and, ultimately, oceans.

Riparian forests in our watershed

Three hundred years ago the Mid-Atlantic region of the United States was entirely forested. The streams were shaded, and all the organisms that lived in them were adapted to woodland conditions. As the land was settled, the forests were cut down and replaced with agricultural fields to provide food for the growing population. Today, urban sprawl threatens many existing riparian forests, almost all of which are secondary growth.

Riparian forests are essential to the health of our streams and rivers in a number of ways:

- They are natural filters, trapping sediments before they can enter the stream.
- They minimize erosion and the effects of flooding.
- They encourage groundwater infiltration.
- They supply the shade necessary to maintain cool water temperatures and rich oxygen levels.
- They provide essential habitat for the entire food chain, from bacteria to algae to insects to fish.
- They enhance the diversity of life in the stream.
- They are home to a variety of mammals, birds, amphibians and reptiles.
- They offer a continuous transportation corridor for the migration of plant and animal species.

Go to www.stroudcenter.org to link to full article in the *Proceedings of the National Academy of* Sciences.