

Riparian Buffers

Pennsylvania’s Best Solution
for Protecting Its Waters

References for “Did you know” statements are attributed to:
4–USDA Agricultural Research Service
www.ars.usda.gov/research/publications/publications.htm?seq_no_115=157358



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Photo: Jennifer Fetter, Penn State Extension

The Problem

Land Use

- Farming
- Cities and industry
- Communities: homes, schools, shopping centers

Pollutants

- Sediment
- Nutrients (from fertilizers, manure, wastewater)
- Leaking vehicles, road salts, pesticides, and other chemicals
- Bacteria and pathogens
- Increased volumes of water entering small streams

Unhealthy Streams

- Lack of aquatic insects, fish, and other animals
- Herd health challenges for livestock farmers
- Human health concerns
- Increased flooding
- Loss of property

A Solution: Riparian Buffers

One of the best ways to protect and improve streams is to add a forested area or meadow next to the water, known as a riparian buffer. A riparian buffer of trees, shrubs, or meadow plants can protect the water from activities happening on the land.

Did you know . . .

- **Riparian buffers** are essential to feed, shelter, and provide travel paths to more than 95 percent of all terrestrial wildlife species in North America. This includes birds, reptiles, amphibians, mammals, and beneficial insects such as pollinators.
- Riparian buffer areas are capable of retaining more than 300,000 pounds of sediment per acre per year.
- USDA studies show that riparian buffers reduce nitrogen from agricultural runoff by 68 percent.
- What lives in the stream is the best indicator of a stream’s health. Many of the stream’s residents depend on the surrounding trees for their food source.

Pennsylvania’s streams range from a worst-case scenario of “no riparian buffer” to the best-of-the-best buffer—a forested riparian buffer. What benefits and challenges will landowners experience based on what’s happening along their waterways?



Photo: Greg Strait, Penn State Extension

No Riparian Protection

THIS IS NOT OKAY

Mowing and pasturing up to the stream edge with unrestricted access to the water leads to harmful conditions for the landowner and the environment.

BENEFITS

- None free of consequences

CHALLENGES

- Eroding streambanks and property loss
- High levels of fecal bacteria and parasites in the stream
- Lack of wildlife habitat (poor hunting, fishing, birdwatching, pollinator populations)
- Lack of tree canopy for healthy stream ecosystems (shade, leaf litter, etc.)
- Livestock health concerns (hoof rot, poor drinking water, mastitis)



Photo: Jennifer Fetter, Penn State Extension



Photo: Robert Meinen, Penn State Extension

Streambank Fence

A BARE MINIMUM IMPROVEMENT

Restricting stream access for livestock or recreational use is a critical first step for reducing impacts.

BENEFITS

- Improves herd health and reduces bacteria and parasites in the water
- Limits erosion to designated use areas only
- Minimal time investment and maintenance

CHALLENGES

- Lack of vegetation allows stream to erode and potentially undercut/destroy fences over time
- Does not improve water quality issues caused by dirty runoff water that still reaches the stream
- No new wildlife habitat
- No new tree canopy for shade and leaf litter



Photo: Lisa Willis



Photo: Robert Meinen, Penn State Extension

Fence + Meadow Buffer

A GOOD START

Allowing meadow plants and native grasses to grow along the stream is a modest improvement.

BENEFITS

- Plants provide moderate filtering of runoff water before it enters the stream
- Provides some new wildlife habitat
- Meadow areas grow deep roots, which help hold streambanks together
- Effort and cost are not significantly greater than fencing alone

CHALLENGES

- Only partial erosion and pollution control
- Wildlife habitat benefits limited
- Still no tree canopy for shade and leaf litter
- Some weed management is required



Photo: Kristen Kyler, Penn State Extension



Photo: Matt Koroth, Lancaster County Conservation District

Forested Riparian Buffer

THE IDEAL SOLUTION

Allowing trees and shrubs to create a forest buffer along a stream is the most impactful solution.

BENEFITS

- Better filtration of runoff water before it enters the stream
- High-quality wildlife habitat (larger game species, fish, birds, pollinators, etc.)
- Tree roots provide greater bank protection
- Tree canopy provides shade and leaf litter
- Water is buffered from nearby activities (fertilizers/ manure, pesticide sprays, development, etc.)
- Low cost in comparison to high benefits
- Assistance and funding resources are available

CHALLENGES

- Weed management and tree care are required
- Loss of space from other land uses



Photo: Jennifer Fetter, Penn State Extension