

The Iowa Watershed Approach

Buffers

What are buffers?

Buffers are established areas of permanent vegetation, within and around fields, and are designed to intercept and filter sediment and nutrients out of surface runoff and shallow groundwater before entering a water course. The vegetation **provides habitat for wildlife** and creates a recreational and aesthetically pleasing area. One of the primary functions of buffers is to slow surface runoff, **trapping 41-100% of the sediment** and significantly **reducing the phosphorus load**. By slowing surface runoff and promoting infiltration, buffers **delay downstream flooding and reduce streamflow by 10%**. Additionally, when shallow groundwater interacts with the buffer's root zone, biological processes can **remove 48-85% of its nitrate-nitrogen**; however, the percent of shallow groundwater that interacts with the root zone could be small. There are many types of buffers which are distinguished by their design and vegetative species, including: riparian forest buffer, filter strips, field borders, field windbreaks, grassed waterways, among others.



Buffers and Flood Reduction

THEIR IMPACT

1. Reduces peak flow rate.

2. Reduces surface runoff and can reduce downstream streamflow by 10%.



Buffers slow the rate of surface runoff, delaying the timing of downstream flood peaks.

Buffers allow surface runoff to infiltrate and recharge groundwater sources.

Buffers and Water Quality

THEIR IMPACT

1. Reduces the sediment load by 41-100%.

2. Reduces the load of nutrients and other pollutants to surface water.

3. Reduces nitrate-N in shallow groundwater by 48-85%.



Sediment carried in surface runoff settles out when slowed down in the buffer.

Filtration and biological processes remove nutrients and chemicals from surface and subsurface water.

Nitrate that moves into the root zone is converted to organic nitrogen or nitrogen gas by plant uptake and biological processes.

Financial Incentives of Buffers

The **Iowa Watershed Approach** provides **90% cost share** for buffers. See your Soil and Water Conservation District or Natural Resources Conservation Service for other cost share opportunities.



Additional Benefits of Buffers

- ▶ Riparian Forest buffers:
 - Provides an ideal hunting area with access to water and shade.
 - Creates habitat for wildlife, such as fish and pollinators.
 - Shade provided by vegetation reduces water temperatures, improving aquatic habitat.
 - Provides a windbreak, benefiting wildlife and adjacent crops and structures.
- ▶ Improves farm safety by not farming up to the stream bank.
- ▶ Can help reduce stream bank erosion.
- ▶ Increases beneficial insect population.
 - Can help control crop pests, such as aphids, corn borer, nematodes and armyworm.
- ▶ Increases the soil organic matter content in and near the buffer area.
- ▶ Buffer trees and plants can be harvested for nuts, timber, biofuels, berries, herbs and others.

For more information on the Iowa Watershed Approach visit: www.iowawatershedapproach.org

www.extension.iastate.edu/waterquality

Prepared by Jamie Benning, program manager, and Kristina TeBockhorst, program specialist, Iowa State University Extension and Outreach. Photo courtesy of Jason Johnson, USDA Natural Resources Conservation Service.

This project is supported by the Iowa Nutrient Research Center.

Iowa State University Extension and Outreach does not discriminate on the basis of age, disability, ethnicity, gender identity, genetic information, marital status, national origin, pregnancy, race, religion, sex, sexual orientation, socioeconomic status, or status as a U.S. veteran. Direct inquiries to Ross Wilburn, 515-294-1482, wilburn@iastate.edu.

