FRENCH CREEK VALLEY CONSERVANCY

FACTSHEET

Riparian Buffer Zones

THE FRENCH CREEK watershed
A COMMUNITY TREASURE

INTRODUCTION

Riparian zones, also known as streamside buffers—are the areas of land along the bank of a creek or other waterway. These areas between the water and upland areas—when filled with trees, shrubs and plants—can take up and remove pollution, use nutrients, and filter dirt from flood water flowing over the land. These actions help to protect or buffer the stream from contaminants and improve water quality. Riparian plants and tree roots stabilize the stream bank by holding the soil in place and filtering runoff from roads, fields, pastures and yards. They also slow down the flow of water, which allows sediment to settle and remain in the riparian buffer. Riparian plants and trees provide food for aquatic invertebrates and fish as the leaves fall into the stream. In addition, fallen branches create habitat for aquatic organisms. The shade created by riparian plants cools the water so life in the stream can thrive. The riparian buffer also provides birds and other animals habitat, including food, shelter and rest areas during migration.

Aerial view of French Creek riparian area North of Meadville, in Crawford County, PA.

SOCIAL VALUES

From a social aspect, riparian zones contribute to nearby property values through services, resources and views. They also improve enjoyment of footpaths and bikeways through supporting water trail networks. Space is created for riparian sports such as fishing, swimming and launching of kayaks, canoes and other paddle craft.

FEATURES

The word **riparian** is derived from the Latin *"ripa"* meaning river bank. In some regions, the terms riparian woodland, riparian forest, riparian buffer zone, riparian corridor and riparian strip are used to characterize a riparian zone.

Riparian zones are distinctly different from surrounding lands because of the unique soil and plant characteristics that are strongly influenced by the presence of water. Riparian vegetation vary from those found in wetlands and typically consist of plants, trees, and shrubs that thrive close to water. The kinds and amounts of vegetation also differ from nearby upland vegetation because more water is supplied to them by the water flowing across the riparian landscape into the nearby water body.

Soil in natural riparian areas consists of dirt and silt of varying textures that are subject to irregular flooding or changing water tables that may reach the surface. (How long the soil stays wet partly depends on the water levels of the nearby water body, as well as the length and intensity of precipitation.) Riparian zones are important in ecology, environmental resource management, and civil engineering because of their role in conserving soil, as well as their influence on aquatic ecosystems, land animals and habitats.

The majority of French Creek boasts lush riparian vegetation on both banks.

Riparian Buffer Zones

Acting as a natural sponge, water, sediment and nutrients are captured by riparian vegetation during high water.

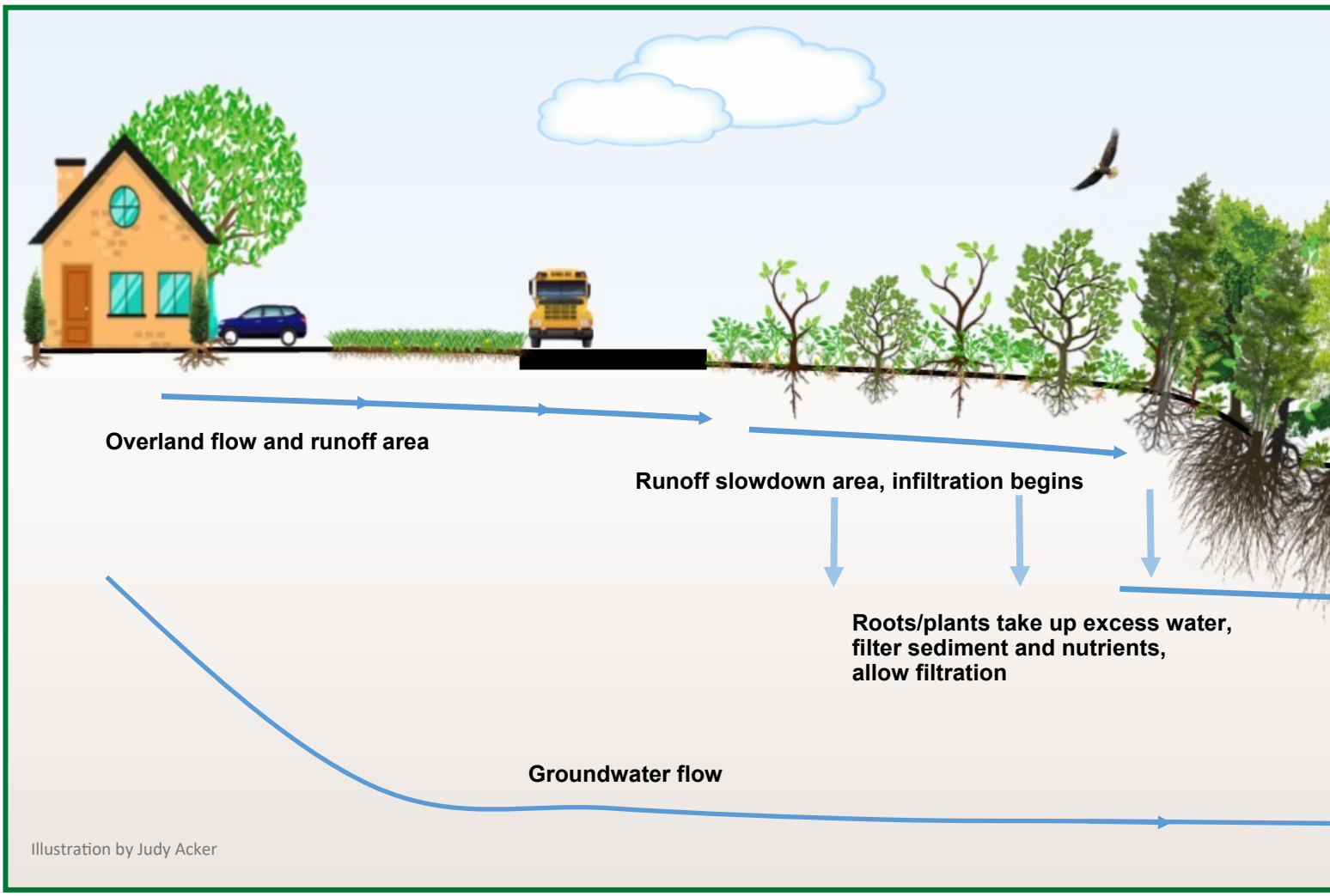
WATER QUALITY VALUE

Riparian zones are important for water quality improvement for both surface runoff as well as water flowing into streams through groundwater flow. Streamside buffers serve as nature's water treatment facilities for our watersheds, capturing and filtering floodwater as it spreads over the streamside area.

Both live vegetation and the absorbent mat of collected plant materials help to trap and hold sediments before they reach the stream. This vegetation also reduces flood water speed, making it less likely for sediment and nutrient-rich organic materials to reenter the stream. The excess sediment and surplus nutrients could make it hard for aquatic life to survive.

Microorganisms and bacteria that thrive in moist riparian soils break down chemical pollutants such as hydrocarbons, further protecting water quality. These dissolved nutrients, especially nitrogen and phosphorus, that are moving with flood water and groundwater, are then taken up and used by riparian trees and shrubs. Riparian zones can play a role in lowering nitrate contamination from sources such as manure and fertilizers from agricultural fields or lawn chemicals from golf courses and yards that would otherwise damage ecosystems and possibly harm human health.

Therefore the vegetation, along with the absorbent quality of the soils in riparian zones, protects water quality by acting as a natural sponge, soaking up flood water as it runs overland. The water is slowly filtered and then released as cleaner water back into the stream.



Riparian Buffer Zones

Areas of stream-side development like lower left, show more signs of erosion and other negative impacts.

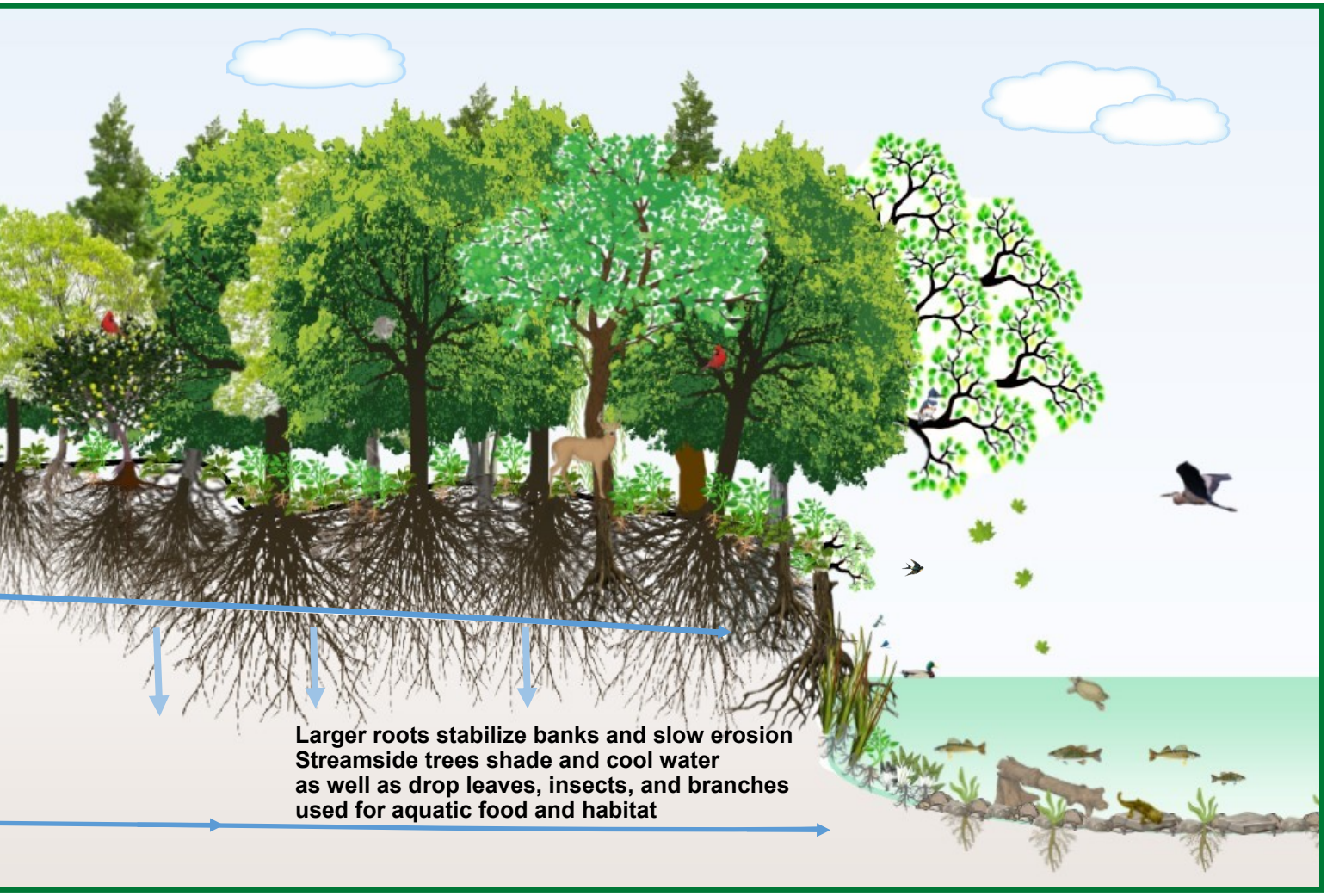
THREATS TO RIPARIAN ZONES

Riparian buffers are the most valuable protection a stream system has against outside influences. Changes made by people often have long-term unfavorable effects on riparian areas. Residential housing, cities, golf courses, and pastureland are the most common causes of riparian zones becoming degraded. Runoff, especially from roads, parking lots, fields, lawns, bare soil, or buildings that are near the stream bank can also have negative effects.

However, building dams across channels, building up the banks, or straightening streams may have the most damaging effects. These modifications significantly alter the movement and storage of water that is so important to the riparian system.

Conversion to cropland, overgrazing livestock in riparian areas for extended periods, or allowing inappropriate logging practices compacts the soil and reduces vegetation. Even development for streamside recreation such as trails or boat launches can destroy natural plant diversity, lead to soil compaction, erosion, and disturb wildlife. In addition, exotic plants often then invade these disturbed areas, overtaking native plants. Therefore, the overall plant diversity declines, resulting in less favorable habitat for most wildlife.

All of these land uses, particularly the removal of vegetation, result in water flowing more quickly through a riparian zone causing the soil to store less moisture, which reduces the overall productivity. Soil compaction, along with less vegetation can lead to longer periods of no flow or low flow in a stream. This can also increase the frequency and duration of flooding as well, making the riparian area less effective in protecting the stream overall.



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Riparian Buffer Zones

WILDLIFE HABITAT VALUE

Riparian zones provide wildlife habitat and passageways, as well as increase plant and animal diversity. These areas allow aquatic and riparian organisms to move along river systems as connected communities. The continuous nature of riparian ecosystems provides corridors that are important for migration and dispersal routes among various habitats for wildlife.

Otters, mink, raccoons, beaver, muskrats, and many other visitors browse the vegetation or visit the water source. Amphibians such as frogs, toads, and salamanders as well as reptiles like snakes and turtles are also found thriving in these habitats. Riparian vegetation can also provide forage for wildlife like deer and even for domestic livestock.

Birds of all types—not just waterfowl and wading birds—use riparian areas often and can find shelter, nesting sites, water and a wide variety of food including insects, amphibians, seeds, grains, fruits, berries, mollusks, flowers, and fish. Even raptors such as hawks and eagles frequent riparian areas looking for prey at the local watering hole and turkey vultures are often seen cleaning up carrion.

Sightings of bald eagles, hawks, herons, ducks, kingfisher, turkey vultures and small birds are common in French Creek riparian areas.

FLOOD CONTROL

Riparian zones help control stream energy. The meandering curves of a river, combined with vegetation and root systems, slow the flow of water, which in turn reduces soil erosion and flood damage. Sediment is trapped, reducing suspended solids creating less cloudy water, replenishing soils, and building stream banks. Because riparian zones occupy low areas in the landscape, ground water is nearer to the surface and available for plants. The fine-textured sediments in flood plains are also able to hold large amounts of water.

These two conditions promote productive and diverse plant communities, therefore riparian area vegetation is a key factor in reducing downstream flooding.

AQUATIC LIFE VALUE

A relatively undisturbed riparian zone supports a healthy stream system. Riparian vegetation contributes shade, food, and shelter for aquatic organisms. Riparian zones are also important for the fish that live within the streams as nutrients from riparian vegetation (e.g. plant material, leaves, and insects) are transferred to aquatic food webs.

Along streams and rivers, the trees and vegetation surrounding them help to shade the water, cooling it which increases the dissolved oxygen that is vital for healthy steam life. Vegetation also contributes leaves and wood debris to streams, which are important to maintaining in-stream habitats and food chains.

Long-term declines to riparian zones can affect fish and other aquatic life, and often restoration is expensive and not always sufficient to recover populations.

RECOMMENDED RIPARIAN WIDTHS

TARGET SPECIES	MINIMUM	OPTIMAL
Aquatic Species	35‘	150’
Large Game	35’	150’
Wildlife Diversity	35’	150’
Non-game birds & mammals	10’	150’
Raptors	35’	300’+
Reptiles and Amphibians	35’	150’
Upland Game	10’	75’
Waterfowl	25’	75’

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Riparian trees, shrubs and vegetation keep soil in place, filter runoff, and slow the flow of water, allowing sediment to settle.