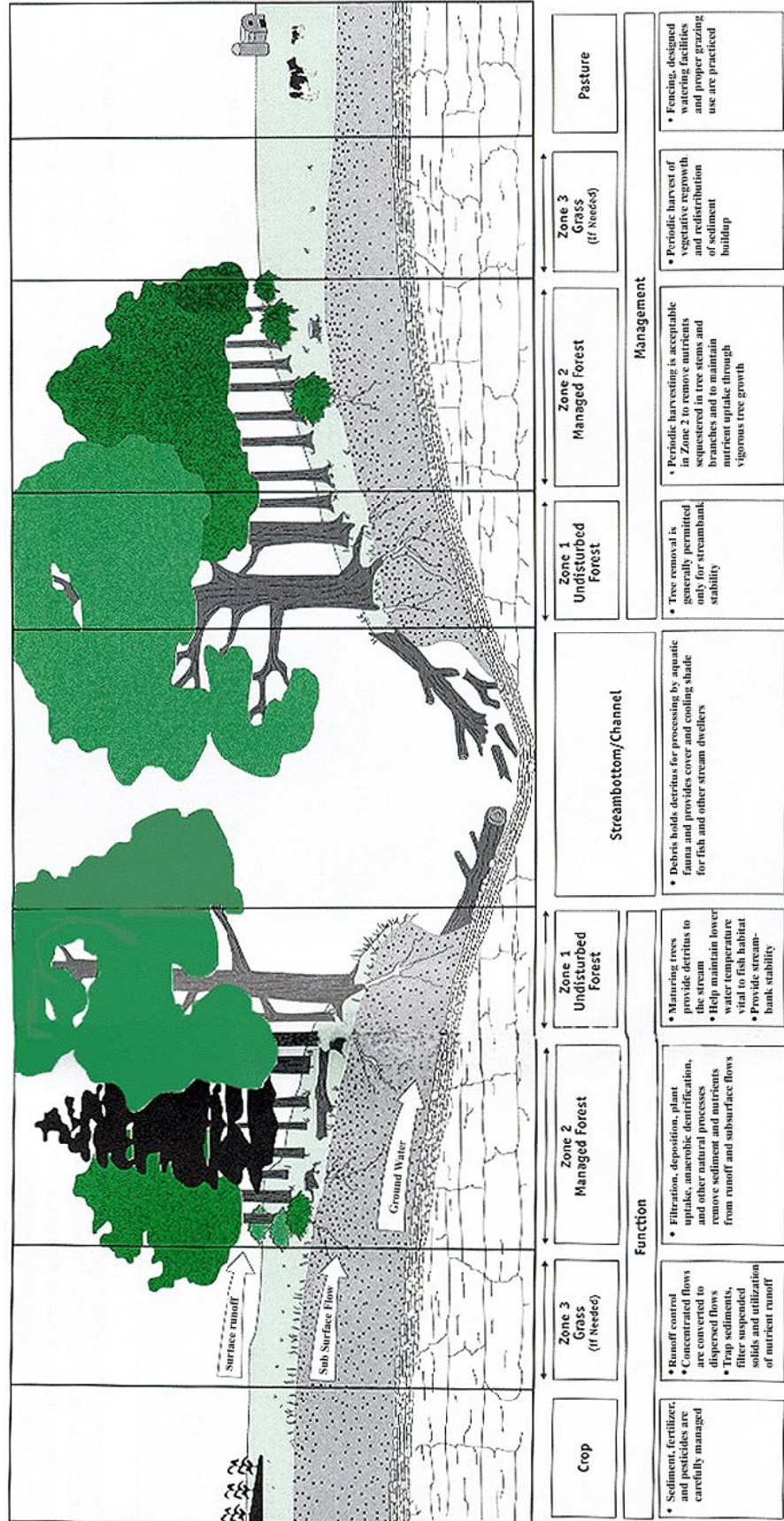


F: Riparian Buffers

The following brief discussion of riparian buffer zones is reprinted from the Chesapeake Bay Program's "Riparian Forest Buffers: Linking Land and Water," U.S. Environmental Protection Agency, March 1999, p. 14-15.

Riparian Buffers: Stabilizing Future Water Quality through Creative Planning



What is a riparian buffer zone?

Riparian zones are vegetated areas along the banks of streams, consisting mainly of trees, that form a transitional boundary between aquatic and terrestrial ecosystems. Riparian zones are critical to the health of the environment by acting as a buffer that protect and maintain streams within their respective watersheds. In riparian zones, upland areas merge with nearby streams, rivers, lakes, and other water bodies, allowing for a crucial exchange of energy and matter to occur.

Many experts, including those at the Chesapeake Bay Program, view riparian buffers as consisting of three zones that border the streambed. Each area has its own management requirements and functions, which vary from site to site. These zones, shown below, are as follows:

- 1) undisturbed forest, which is a mixture of fast and slow growing trees
- 2) managed forest, consisting of timber for harvest, wildlife habitat, and recreational zones, and 3) areas of grass, managed to promote the uptake of nutrients and the filtration of sediments.

Source: *US EPA Chesapeake Bay Program, March 1999 Reprint.*

Why is it important to establish and protect riparian buffers zones?

Riparian zones form the “natural barrier” between water and the land, cushioning each ecosystem from activities occurring within the watershed while simultaneously providing for the stability of the area’s environmental health. The following vital functions are performed by riparian zones:

- **Flood attenuation** - The root systems in riparian zones continuously take up, store, and discharge water in a way that slows the rate of water during a flood and reduces the impact of high water on downstream areas.
- **Filtration of runoff and sedimentation reduction** - Forested riparian zones have a substantially higher rate of infiltration of pesticides, fertilizers, and sediments than non-forested zones. This is because the trees have the ability to absorb and modify a large amount of the pollutants migrating through riparian zones before they make their way into the water. The bacteria present at the forest floor also encourages the process of denitrification, where nitrate, a nutrient that would otherwise be harmful to the water, is converted into nitrogen gas.
- **Streambank stability** - Deep tree roots help to secure the soil in fragile riparian zones. This allows for a reduced rate of soil erosion and the stabilization of stream banks..
- **Provision of a canopy** - The shade from the forest moderates the temperature and oxygen content of the water, which is essential for both proper stream health and the functioning of aquatic organisms. The canopy also acts as a food source for many bottom-dwellers of the aquatic food chain when leaves, branches, and logs enter the water.
- **Habitat diversity** - Riparian zones supply critical layers of habitat that are required by both aquatic and terrestrial species at some point in their life cycles. It provides a gateway for wildlife of the different ecosystems, and is an ideal living environment for reptiles and amphibians.
- **Encourages long-term ecosystem health** - Riparian zones cushion the interaction between aquatic and terrestrial ecosystems to ensure that the activities within one do not overwhelm the functions of the other.

Overall, riparian zones offer a form of protection that is irreplaceable to both aquatic and terrestrial conservation efforts. They are economical to maintain, especially when compared to the construction and maintenance costs of flood damage repair, erosion control measures, habitat restoration, and pollution clean up.

By requiring the protection of riparian areas in zoning laws through the establishment of stream setbacks and site plan review for activities within the buffer, communities can protect their water resources for the future and prevent many water quality problems today.