

Riparian Areas

Riparian areas are the transition area between the dry uplands and the aquatic stream channels. Often groundwater is close to the surface here and the area can support a large variety of plant species that require wetter conditions than are found on the adjacent uplands. This tight juxtaposition of aquatic, semi-aquatic and upland habitats creates an area that is high in both plant and animal diversity. These areas are critical habitat for animals such as amphibians that require both wet and dry areas for different parts of their life cycles. Due to their linear nature they also often function as corridors, providing cover, food, and habitat for animals as they move through the landscape.

Riparian areas also have a critical role in nutrient cycling. The meandering channels and dense vegetation slow the passage of stream water. During floods, water spreads out over these wide bottomlands and deposits sediments, building up banks and reducing the turbidity of water passing downstream. The slowed passage of water also means that the vegetation has time to take up nutrients such as nitrogen and phosphorus that can become pollutants in downstream bays and estuaries. Many times riparian areas also contain wetlands, which, due to their saturated soil, have anoxic sediments. These oxygen-free areas are home to a variety of bacteria that take nitrate and convert it to nitrogen gas as part of their normal metabolic processes. This takes excess nitrogen from fertilization from the land and returns it to the atmosphere, completing the nitrogen cycle and decreasing harmful excess nitrogen in the environment.

Many of the riparian areas in the mid-Atlantic and throughout the world have been destroyed or damaged and no longer provide these essential habitat and functions. Within the past few decades, many streams in the mid-Atlantic have become severely down-cut which decouples the stream from its floodplain. Ground water levels drop, water-loving plants in the riparian areas die, and stream water is no longer able to access the floodplain. Sediments and nutrients, instead of being deposited on floodplains, are exported directly out to the oceans. The causes of this are varied and not completely understood. The down-cutting is likely caused by a combination of factors including altered rainfall patterns due to climate change, increased runoff due to impervious surfaces, and the historic buildup of sediment behind milldams that were a source of early power in the area. The cure for this ailment is to restructure the stream channel so it is the right size for the increased amount of runoff, and to remove excess sediment so the channel is once again able to access the floodplain. We're currently working with First Mine Run, Ecotone and the Chesapeake Bay Trust to determine how successful this type of project is in restoring riparian vegetation and decreasing export of sediments and nutrients.

Wavyleaf ecology and early detection.