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Division of Resource Conservation and Forestry

Riparian Area Management

Benefits of a Healthy Riparian Area

- Flood control
- Water Quality Esthetics
- Wildlife Habitat

Riparian System Structure

- Zone 1
- Zone 2
- Zone 3

Misuse of Riparian Areas

- Heavy Grazing
- Tillage Cropping
- Urban development
- Water Flow Modification

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Riparian areas are the margins of streams, rivers, and intermittent draws, where vegetation is strongly influenced by the presence of water. This area exhibits characteristics of both the surrounding upland and bottomland systems. Healthy riparian areas would normally be vegetated with lush growths of grasses, forbs, shrubs, and trees that are tolerant to periodic flooding.

Some argue that the Great Plains were dominated by grasslands and that riparian woodlands were rare. The US Fish and Wildlife Service (1981) drew upon 1905 conditions for insight and concluded that trees were “wholly absent” or consisted of scattered cottonwood and willow. However, a more complete reading of historical records indicate that by the early 1900’s, most riparian areas in the Great Plains had long been depleted of their natural woody vegetation. In fact, abundant historical evidence from the 1800’s supports a very different picture of Great Plains with large and healthy riparian forests along the many streams and rivers of the area. The lack of trees noted by the year 1905 was the consequence of some of the most rapid and wrenching changes the region has ever known. Great Plains riparian areas were significantly affected in the mid 1800’s from the simultaneous and cumulative harvest pressure of Native Americans, gold seekers, soldiers, railroad crews, river commerce (wood fired steam engines) and settlers; each affecting the way riparian areas look today. Natural resource restoration efforts that target “natural” conditions need to use pre 1843 scenarios to accurately depict natural riparian areas in the Great Plains. (“A Long, Long Time Ago ...” by Elliott West and Greg Ruark printed in the Journal of Soil and Water Conservation, Volume 59, Number 5.)

Farming/Ranching Along the Stream

Producers that own land crossed by a stream face an interesting dilemma; protect the area, foregoing tilled crop production or heavy grazing; or cultivate/heavy graze which would sacrifice the stream’s shorelands, and possibly even alter the stream’s hydrology itself.

Historically many producers have chosen the second option. The prevailing logic was to maximize the acreage under production and improve the ease of operation.

This approach is being challenged as producers become more aware of the values of a healthy riparian

area and the benefits provided to the land around it. In fact, producers are finding many of these wet spots are only minimally productive for annual tillage cropping, especially considering costs of the fuel and nutrient inputs required. Many are changing their farming and ranching practices and creating buffer strips along streams.

Benefits of a Healthy Riparian Area

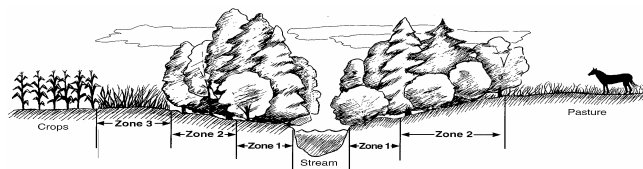
Flood Control – riparian areas associated with river and stream flood plains act as water storage areas that can reduce floodwater velocities and height downstream. Healthy riparian areas act like sponges. When water is slowed, these areas allow some of the excess water to enter ground water storage areas.

Water Quality – riparian areas are important to the control of non-point sources of pollution from land management practices. Non-point source pollutants include sediment, nutrients, pesticides, animal waste, and other substances that enter our water supply as runoff. Suspended sediment blocks sunlight, limiting the growth and reproduction of aquatic plants and interfering with the feeding and reproduction of bottom-dwelling fish and aquatic insects. Riparian vegetation slows runoff from upland sites, allowing the settling out of water borne sediment, nutrients, and toxicants. Studies have shown that streamside forests can reduce sediments by 50 percent, nitrates by 80 percent and phosphates 50 percent. By providing shade to streams and rivers, riparian forests positively affect nutrient availability in the water.

Wildlife Habitat – Due to their proximity to water and open areas, forest buffers are extremely important habitat for many wildlife species. They serve as travel corridors between different habitat types. Trees shade waterways improving aquatic habitat by lowering water temperatures and increasing dissolved oxygen levels. Streams with no shade can show an increase in temperatures of 10 to 15 degrees Fahrenheit. Overhanging branches and roots provide cover. Leaves, twigs, flowers, animals, and insects provide the fundamental food source in the aquatic food chain. What better way for your family to hunt, fish, and explore: right on your own property.

Riparian System Structure

Riparian systems may have one to three zones, depending on the location and habitat structure.



Zone 1 – This zone hosts species found along the water’s edge. Common species include sedges and rushes that are water loving and capable of stabilizing stream banks with their deep roots. These species are critical for promoting water recharge and decreasing depth to water table.

Zone 2 – This zone contains species that are found in wet ground and consist of shrubs, trees, moisture loving grasses, and water tolerant broad-leaved plants. These plants catch water, facilitate absorption of nutrients transported into the area by runoff and ground water, and provide wildlife habitat for terrestrial animals.

Zone 3 – This zone is located where the riparian area merges with the uplands and includes a mixture of riparian and upland species. The area is also host to many terrestrial animals including early successional, edge-loving species.

Misuse of Riparian Areas

Agricultural Management – Grazing animals with unrestricted access to riparian areas may remove streamside vegetation, compact or disturb soils leading to noxious weed invasion and bank breakdown. In addition, their manure is deposited or washed into the stream resulting in excess nutrients, organic matter, and pathogens.

Riparian areas have often been converted to cropland because of soil fertility and access to irrigation water. This removal of permanent vegetation, reduces the water infiltration rate, increases water temperature, and increases erosion.

Urbanization – Often sediment and erosion controls at development sites are inadequate for the type of land being developed. Some construction sites have improper erosion and sediment control, and the remaining riparian area is unable to mediate the sediment load entering the water. Impervious surfaces, such as parking lots and road have quicker runoff, resulting in earlier and higher peak flow.

Water Flow Modifications – Dams, levees, and stream channelization significantly alter water movement and storage in riparian systems. These modifications can severely alter the suitability of river and streams to spawning and migratory fish. Diversions for irrigation impact plant life and life cycles and movement of aquatic organisms.