# Riparian Areas: Their Importance and Threats

Riparian areas are those lands that border natural waterways, such as streams, rivers, and lakes. In the western United States, riparian areas comprise less than 1% of the total land area. They are almost always adjacent to arid upland areas where vegetation and animal life are less diverse and where water is less accessible.

These water-rich areas are valuable for their ability to sustain diverse vegetation, provide habitat for endangered and threatened species, and purify and replenish natural aquifers. Other, more humid, parts of the United States have similar riparian areas but are less distinctive than they are in drier regions.

Riparian areas have become increasingly vulnerable due to development, overgrazing, dam construction, clearance of vegetation, and increased recreational uses. These unique and valuable areas are essential to the well-being of local communities and the future of a healthy, productive environment.

## Characteristics of Riparian Areas

Across the United States, riparian areas are similar ecologically. The key characteristics shared by these areas include fresh, flowing water, diverse vegetation, and sedimentary soil. These characteristics must work together successfully to maintain a healthy riparian environment.

### Water flow

Water flow is critical in a riparian ecosystem. Riparian areas are low-lying which permits the water to flow easily. This flow carries sedimentary materials along the streambeds or river channels; seasonal fluctuations may alter this flow with periodic flooding. Groundwater levels are closer to the surface and easily available to plant life. The water carries essential nutrients that support the vegetation and provides a cooling environment for fish and insect populations. Wildlife often depends solely upon these water sources, particularly in the western United States.

### Diverse vegetation

Vegetation flourishes because of the availability of water and rich soil. Tree roots and fallen trunks and branches can slow water flow creating a supportive environment for aquatic insects. Pools and eddies provide nurseries for freshwater fish species which can then feed on the insects. This organic material also allows time for water to infiltrate the soil. Leaf drop contributes to the energy cycle by providing food to fish and rich organic matter to the ecosystem. Vegetation provides shelter from extreme temperatures, keeping streams cool and providing more oxygen for fish to breathe. Wildlife habitat is made available with the abundance of water, cover, and nesting areas.

### Sedimentary soil

Sedimentary materials deposited by the movement of water prevent erosion, provide a source of minerals and other nutrients for vegetation, and act as a filter for groundwater. The soil in a riparian area is composed of stratified sediments which can store large amounts of water.

## Threats to Riparian Areas

Factors affecting the ecosystem of a riparian area include natural events, such as flooding and drought, and manmade changes. Natural, seasonal flooding may initially appear destructive, but the riparian environment can recover quickly.

Manmade changes are much more influential and long-term. The most common types of damage caused by man are development, re-channelization of the water flow (dams and levees), clearing vegetation, logging, overgrazing by livestock, and recreational activities.

### Recreational development

Recreational development also can disturb the natural balance between plant life and animal habitats. These changes may affect water quality by introducing waste products. Development can include urbanization, mining, irrigation, and other agricultural uses. These developments withdraw water from the riparian system and consequently reduce the water table.

### Reducing and re-channelizing water flow

As the groundwater levels are lowered, there is less water for plant growth, affecting the type and quantity of vegetation. When the water flow rate is reduced, less soil material and other nutrients can pass through the ecosystem. Non-native plant species may be inadvertently introduced causing a decline in the native plant population. Additionally, pollutants may be introduced, affecting water quality throughout the area. Wildlife habitats can be dramatically affected since many endangered and threatened species depend on a healthy riparian environment.

When a dam is constructed at the headwaters leading to a riparian area, water flow can be significantly affected. Water is prevented from flowing naturally causing a reduction in sedimentary materials from being carried downstream and thus affecting the quality of water and soil for plant growth. Releasing large amounts of water at one time can cause flooding and destruction of soil deposits along the streambanks and uproot vegetation.

### Removing vegetation

Logging, clearance of vegetation, and livestock grazing all have a major impact on riparian areas. Once vegetation is removed, water can move quickly, taking with it any remaining soil material. When sedimentary soils are gone, water cannot be stored and groundwater is reduced. Plants are unable to take root and mature. Animal and bird habitats are impacted; wildlife corridors can be altered interrupting migratory patterns. Pollutants are introduced to the system without adequate sediments to filter them out. Livestock grazing removes additional plant material and further erodes stream banks.

### Recreational activities

Many people are attracted to riparian areas because of the natural environment of water, trees, and wildlife. When poorly managed, hiking, camping, fishing, and other recreational activities can degrade a riparian ecosystem. If vegetation is damaged and soil eroded, wildlife habitats can be changed sufficiently to drive out many species of birds and animals.

## Protecting Riparian Areas

Riparian areas can be protected and rehabilitated with effective management techniques. Local and regional policies can include controlling urbanization and other developments. Mining, logging, and grazing can be managed to reduce the impact on these areas. Community developments can be situated so they do not interfere with the quantity and quality of natural aquifers connected to a riparian area.

Conservation techniques can be implemented to reduce the demand for nearby groundwater sources. Streams and rivers feeding into a riparian environment can be allowed to flow freely by not constructing dams and other water-diverting developments. Educating those who use these areas for recreation can limit damage to these delicate environments.

Riparian areas are truly unique ecosystems that can be protected with sound policies and thoughtful long-range planning. Local and regional organizations must be able to preserve them for future generations.

## Sources

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