

## Riparian Health

*This information sheet series was produced by the Dolores River Dialogue (DRD) to educate interested citizens and organizations about the issues that the DRD is addressing. Please refer to the web site <<http://ocs.fortlewis.edu/drd/>> for more information.*

### Background

Riparian ecology is the study of the vegetative corridor along a stream. Riparian communities are largely determined by and dependent on river flows and channel dynamics.

A variety of riparian habitats occur along the length of the Dolores River, and change as the elevation, gradient, flows, channel dynamics, soil types, salinity, and precipitation change along the river.

The natural pattern of flows on the Dolores River has been altered for over a century. In the mid-1880's irrigators began diverting a large portion of Dolores River summer flows into the San Juan River basin to irrigate farmland. Then in 1986, McPhee Reservoir was completed, making it possible for water managers to store water in the spring when it is more plentiful and then use that water in drier parts of the year for a variety of uses outside the Dolores River watershed.

### Why is riparian ecology important?

Riparian vegetation provides the fundamental structure for diversity of flora and fauna found along the river. Healthy native riparian areas provide an appropriate level of bank stability, help filter sediment and nutrients draining off of upland areas toward the channel, and provide productive and diverse habitat both on land and in the water for native species that depend on the riparian and/or aquatic environment. In addition, healthy native riparian systems can provide productive forage and shelter for wildlife, and appealing scenery for recreationists.

### Status

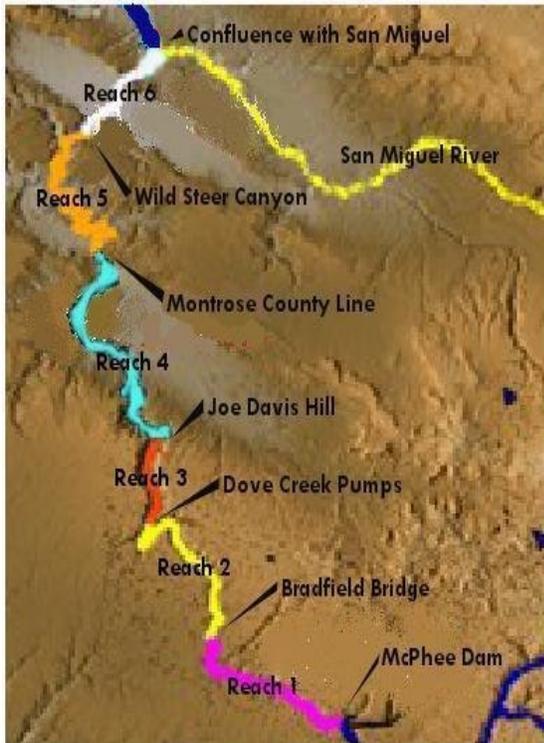
Since the completion of McPhee Reservoir, the mean annual peak flow measured at Bedrock has decreased by nearly 50 percent, the duration of the high peak has decreased by 60 percent, and the frequency of a given peak flow has decreased (Wilcox and Merritt, 2005) (Richard and Anderson, 2007) (Richard and Wilcox, 2005). However, baseflows are higher during irrigation season than before McPhee was constructed, and in many months baseflows below McPhee are higher than those found flowing through the town of Dolores.

### Unusual riparian plant communities in the Dolores River Corridor

- Strapleaf willow and coyote willow found together
- Multi-level plant community of narrowleaf cottonwood-boxelder/red-osier dogwood
- Large stands of skunkbrush
- Extensive stands dominated by New Mexico privet occur only in Utah and Colorado, and in Colorado they are found only in the Dolores River basin.

A reduction in frequency of high flows can cause shifts in the species composition in riparian areas by favoring species that are more aggressive competitors. The establishment of cottonwoods and other native plant species relies heavily on processes associated with peak flows and overbank flooding. A reduction in these processes has been implicated in the reduction of recruitment of cottonwoods.

Tamarisk is an invasive exotic species, that favors lower elevations, perennial water and saline conditions (Merritt, 2005). Around the western United States, tamarisk was introduced in many places to aid in erosion control and also as an ornamental plant. The introduction of tamarisk into the Dolores River watershed is thought to have been between the 1930's and the 1950's. Russian knapweed is another exotic species that has invaded much of the riparian area on the Dolores River, particularly downstream of Disappointment Creek.



The Dolores River Dialogue has identified six distinct “reaches” by characteristics like gradient, temperature, and channel type between McPhee Reservoir and the confluence with the San Miguel River. (See map) The following is a reach-by-reach overview of riparian habitat:

*Reach 1:* narrowleaf cottonwood community, with some boxelder and red-osier dogwood; coyote willow also common

*Reach 2:* boxelder, coyote willow, and silver buffalo berry

*Reach 3:* fairly dense willow communities with a sedge/ grass understory growing nearer the bank and down into the active channel

*Reach 4 and 6:* remote stands of older cottonwoods

*Parts of Reach 4, Reach 5 below Coyote Wash, and most of Reach 6:* dense stands of tamarisk

#### Riparian Health Goals

- Floodplain scour and sediment deposition
- Floodplain saturation to promote nutrient cycling between the riparian and the aquatic environment(s)
- Cottonwood seedling establishment

#### Key Questions

- What management opportunities exist to maintain or improve the quality of the existing riparian habitat?
- Should existing stands of tamarisk be controlled and restored to native vegetation? What are the most effective methods for restoring native vegetation?
- What, if any, effect will the tamarisk beetle have on native vegetation?
- Have new stands of cottonwoods been established since construction of McPhee Dam, and what flows are associated with that establishment?
- What are the relationships between river flows, riparian habitat, aquatic habitat, fish populations, and water quality?
- What are the status and rate of vegetation encroachment onto the floodplain?
- How have the Dolores River riparian habitat and stream channel changed since the construction of McPhee Dam?

#### Who is working on it?

The DRD is completing field investigations of the relationship of flow management to river channel processes, salinity, and riparian vegetation in Reach 4. A Master of Science degree candidate at Northern Arizona University, Adam Coble, is working with the DRD to research factors affecting the recruitment and growth of cottonwoods on the Dolores and San Miguel Rivers. The Colorado Division of Wildlife is monitoring river channel, sediment, and trout habitat dynamics in Reach 1. In 2009, the Bureau of Reclamation funded Dr. C. Dott, Dr. J. Korb, and Dr. D. Kendell at Fort Lewis College to study the factors leading to the establishment and survival of tamarisk on the Lower Dolores.

The Dolores River Restoration Partnership is a regional coalition that includes the Nature Conservancy, Dolores Tamarisk Action Group, the Southwest Conservation Corps, Canyon Country Youth Corps, the Walton Family Foundation, the Tamarisk Coalition, and the Bureau of Land Management. The Partnership began tamarisk removal and native vegetation restoration efforts in 2009. Dr. Anna Sher of the Denver Botanic Gardens is working with the Partnership to monitor the success of their efforts.