

RIPARIAN AND WETLAND ECOSYSTEMS

Riparian and wetland areas are high biodiversity ecosystems that have been historically impacted by human development such as roads or draining for construction and also by livestock and wildlife overgrazing. Impacts can lead to increased erosion, incising or downcutting of streams, or channelization and subsequent drying of wetlands. Vermejo is working to increase riparian vegetation and biodiversity through balanced carrying capacity and riparian exclosures while conducting restoration projects to restore natural function to the streams and protect wetlands on the property.

Riparian Ecosystems

Riparian ecosystems, the transition zone between terrestrial and aquatic systems, make up about 2% of Vermejo but support a very high density and diversity of plants and animals. Riparian areas provide water to wildlife and bison, and habitat for migratory birds and small rodents. Roughly 50% of breeding birds in the southwest are dependent on riparian areas and 70% of endangered species depend on riparian systems for survival. Riparian ecosystems are intertwined with stream and river dynamics. Stream dynamics include rate of water flow, path of the stream (does it meander or is it straight), the shape of the stream channel (steep banks, or relatively flat), the drop in elevation along a stream reach, and the material lining the channel (silt, small pebbles, cobbles).

The dense riparian vegetation growing in the often-saturated soils acts as a nutrient and sediment filter to help maintain water quality. Riparian vegetation also aids in stabilizing stream banks, reducing erosion and sediment load, and slowing flow during higher runoff times. The vegetation slows water flow along banks. Shade from riparian canopy (shrubs and trees) can reduce water temperature for native Rio Grande cutthroat trout. The trout tolerate water temperature only up to about 70 degrees F. Plant litter or plant debris that falls into the stream is food for aquatic macroinvertebrates (aquatic insects) which in turn is food for the cutthroat trout and other species.

Riparian Restoration

The Spring Fire, a large wildland fire in 2002, removed most vegetation from the upper watershed causing dramatic flooding for at least 5 years following the fire. Riparian structures were built to help restore the left fork of Spring Creek and reduce erosion in the burn scar. The drainage has healed over with native plants and the structures have caught significant amounts of sediment preventing it from being transported downstream into the Vermejo River.

Starting in 2009, a series (20+) small to medium sized riparian exclosures were built along the Vermejo River to assess if riparian plants would re-establish when grazing and browsing pressure was removed. The small exclosures grew in with alder and willows and the medium sized exclosure at the Bernal Creek - Vermejo River confluence proved cottonwood regeneration was also possible. These test exclosures were key in obtaining grant funding for the future large Vermejo River exclosure project with US Fish and Wildlife Service - Partners for Wildlife.

From 2014 – 2020, 12 large exclosures were built on the Vermejo River and Leandro Creek. Vermejo partnered with US Fish and Wildlife Service - Partners for Wildlife to build 10 half mile long exclosures on the upper Vermejo River. An additional 2 exclosures were then built on Leandro Creek. The exclosures have allowed dramatic regrowth of willows, alders, cottonwoods, sedges, rush and other riparian plant species.

The goal was to provide shade to cool the waters for the Vermejo River cutthroat trout population as well as restore the riparian function to the system and increase habitat and species diversity. The current number of beaver dams along the system is a good indicator that the riparian system as a whole is returning to a more natural and functioning state. Narrowleaf cottonwood poles (young trees cut at other locations on Vermejo) were planted in some of the riparian exclosures where there were no remaining trees to create new sprouts or seedlings.

The redesign of low water road crossings on the Upper Vermejo has stabilized the reaches, reduced sediment load downstream, and may help in long-term stream temperature reduction.

Headwater Sloped Wetlands

Wetlands, like riparian areas, filter and slow water, while creating areas of high biodiversity. Headwater sloped wetlands are high elevation wetlands fed by snowmelt that have dispersed flow across the slope. The wetlands are the beginning of the hydrologic system that supply Casias and Costilla Creeks, and then the Costilla Reservoir providing cold water for the Rio Grande cutthroat trout habitat. If the wetlands are functioning naturally, they will not have a stream channel. The wetland soil and plants will act like a sponge, slowly absorbing and releasing melt from the snowpack into the stream system below. Poorly designed roads or culverts, livestock or wildlife trailing, hiking or horse trails, and vehicle off-road use can cause erosion that could channelize water flow and subsequently dry out the wetland areas. New Mexico Natural Heritage has been studying Vermejo's sloped wetlands to develop a sloped wetlands rapid assessment method for wetlands across the state.

Wet Meadows

Relatively flat or depressional open patches in the dense spruce-fir or aspen stands in Vermejo's higher elevations are wet meadows. The wet meadows may appear to be grasslands but are wetlands as they remain wet or frozen. These wetlands are dominated by sedges, rushes, and high elevation wetland forb species including wildflowers. These small patches in the forest are biodiversity hot spots. Summer in a wet meadow will have an abundance of high elevation flowering forbs, birds, insects and herbivores and the transition zone between forest and wet meadow often has a variety of fungi species. The water source for the wet meadows is snowmelt, summer rains and potentially groundwater. The wetlands accumulate organic matter, filter water, slow runoff, and provide pockets of habitat for wildlife.

Constructed Wetlands

In 2011, New Mexico Department of Transportation asked to design a wetland re-construction project north of New Mexico Hwy 58 on a reach of Ponil Creek on Vermejo's shortgrass prairie. The 40 acre riparian wetland was built and planted creating habit for migrating birds and species such as the northern leopard frog that is in decline in New Mexico.

Continuing & Future Work

Vermejo Natural Resources will continue the monitoring of stream temperatures, vegetation diversity, vegetation cover with photo/drone monitoring, streambed particle size (indicator of force of flow) and channel cross-sections (shape and elevation of channel) along the Vermejo River. Vermejo also plans to continue stream restoration projects including channel restorations and improving low water road crossings

and removing old fish barriers. Aquatic insect, amphibian, bird and small mammal surveys/studies may provide insight to the progress of riparian recovery. Vermejo scientists also will continue to protect the delicate wetlands on the property, assessing impacts of roads, trails as well as grazing impacts through range monitoring while continuing to work with organizations like New Mexico Natural Heritage.