

Biology that streamflow declines in the Concho River watershed in Texas result from rangeland recovery, not interception of would-be baseflow by woody plants as commonly thought.

The Concho rangeland began as prairie savanna, but heavy grazing from the 1870s to the 1950s transformed it to degraded grassland encroached by woody plants. Since 1960, vegetative cover—both woody and herbaceous—has increased. The researchers found that stormflows from 1960 to 2005 in the Concho watershed decreased significantly, particularly in the North Concho watershed, without any corresponding decrease in precipitation. In contrast, baseflow for all the watersheds remained essentially consistent or increased slightly in the same time period.

The authors concluded that higher levels of evapotranspiration from woody plants are not causing the drop in stormflow, because that effect would be reflected by a significant drop in baseflow as well. They attribute the stormflow decline to increased soil infiltration due to greater vegetation cover that slows overland flow.

The researchers believe that in contrast to the common belief that woody plants contribute to hydrological degradation, they have actually been part of the recovery process. Accordingly, they suggest that large-scale shrub clearing will not lead to significant increases in streamflow in many semi-arid rangelands.

See Wilcox, B.P., Y. Huang, and J.W. Walker, 2008. Long-term trends in streamflow from semiarid rangelands: Uncovering drivers of change, Global Change Biology, 14: 1676–1689, doi: 10.1111/j.1365-2486.2008.01578.x

Dams Favor Non-Native Fish, Hurt Natives

Damming of the Colorado River and introduction of game fish species has caused an extensive decline in native fish numbers, researchers reported in *Science Daily* in July. Physical changes to the river impair survival of native fish, but not introduced fish, because of their differing life histories.

Alice Gibb of Northern Arizona University and her colleagues studied the early life of both native and non-native fish species in the laboratory. Native fish are less

developed when they hatch compared to non-native fish, and as a result of the lack of adult swimming appendages, they have a poorer escape response to predators. Native species on the Colorado include razorback sucker, humpback and roundtail chub, bonytail chub, and pikeminnow.

Before the development of dams on the river, the native larvae were much better equipped for survival. Suspended sediment provided refuge from predators, turbulence made encountering plankton fairly easy, and warmer water allowed rapid growth. Dams have taken away these favorable conditions, replacing them with still, cold-water lakes.

Gibb suggested removing not only introduced predators, but the dams themselves to recreate the “high-flow, sediment-rich, warm waters that gave the Colorado its name,” she reported to *Science Daily*. She adds that recent research in Texas and the Pacific Northwest indicates that sediment might favor native fish in those areas as well.

See River Damming Leads to Dramatic Decline in Native Fish Numbers, www.sciencedaily.com/releases/2008/07/080709204836.htm.

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