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The Effects of Rocky Mountain Juniper Encroachment on Stream Water Availability

Juniper encroachment has been occurring in rangelands across the western United States since the 1800's. This has largely been due to the introduction of livestock and fire suppression that began in the 1800's. A more recent factor in juniper encroachment is of course climate change. Woody plants experience an increase in growth as a result of increased levels of CO₂ and juniper is no exception to this. As a result of all of these factors, juniper is widespread in many rangelands and is now encroaching on riparian areas in rangeland streams. Ted Turner has taken a special interest in stream conservation with Turner Enterprises investing significant money into protection, restoration, and conservation of trout streams on his many ranches. Turner Enterprises is concerned that encroaching juniper in the riparian area along streams on the Snowcrest Ranch is having an adverse effect on stream water. There is concern that this will then effect stream and fishery health. This study examined the water source of the rocky mountain juniper using oxygen isotopes to determine if they were in fact using stream water as a primary water source. This was then compared to a natural riparian plant, the willow, a species whose growth the ranch is promoting. This research is still ongoing, but preliminary results from Willow Creek on Snowcrest Ranch did not show that juniper was tapping into stream water as the primary water source and that there was no clear distinction in water use between Rocky Mountain Juniper and Willow.