

Soil Recovery after Herbicide Treatment of Salt Cedar Stands and Management Implications

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PURPOSE OF STUDY

Salt cedar is a nonnative species introduced from Asia in the 1800s to serve as a windbreak and for river bank erosion control. The root system of the salt cedar decreases flow and increases sediment deposits, along with using a couple hundred gallons of water a day and concentrating salt in its leaves. The saline soils surrounding salt cedars make it difficult for most native riparian plants to survive; however, the extent to which salt cedars affect the ecosystem is not fully understood. From 2001 to 2003, three salt cedar stands in the Bosque del Apache National Wildlife Refuge were sprayed with herbicide. The researchers will determine the relationship of selected soil chemical properties to live and dead salt cedar trees within the same stand. They will also examine how much precipitation or irrigation would be needed to return the saline soils to a level tolerable to native species.

STUDY UNDERWAY

- The researchers will measure salinity, sodium adsorption ratio, chloride concentration, and pH using saturated paste extracts.
- Soil columns will be irrigated at varying rates, and the soil will be analyzed for salt content as a function of depth and water applied.
- The researchers will use previously collected data to determine the vegetation density and percent kill of the salt cedars treated with herbicide for all of the plots.
- The researchers will determine if one soil property or method of analysis is sensitive and effective enough to indicate differences in the soil properties between treatments.

BENEFITS

- Further understanding of the impact of salt cedar on ecosystems will benefit salt cedar eradication efforts, which may help to supply more water for municipal, agricultural, and ecological needs.

Cheryl Rosel collecting surface soil samples and leaf litter samples from a live saltcedar tree at the Bosque del Apache NWR.



April Ulery taking a salinity measurement of a soil sample in the field.

Saturation paste extracts from soil samples taken from beneath saltcedar trees. The darker colors are due to high organic matter in the soil.



April Ulery and Kirk McDaniel investigating possible research sites.