

DESCRIPTION OF THE JUNIPER AND PINYON  
ERADICATION PROJECT, FORT APACHE  
INDIAN RESERVATION, ARIZONA

By

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A study of the effects of juniper and pinyon eradication in the central part of the Fort Apache Indian Reservation is being made by the U. S. Geological Survey. The study area encompasses the combined Carrizo Creek and Corduroy Creek drainage basins. Streamflow and precipitation in these basins are measured to determine changes in runoff caused by alterations of vegetation.

Two smaller areas within these drainage basins, Cibecue Ridge and Apache Ponds, each of which contains a pair of small drainage basins, are being studied intensively with respect to vegetational changes due to juniper control treatments, precipitation, precipitation interception by juniper and pinyon, runoff, sediment yield, wind velocity, solar radiation, air temperature and humidity, and soil temperatures and moisture content.

Juniper and pinyon will be removed from one of the small drainage basins in the Cibecue Ridge area at the completion of a 5-year pretreatment calibration period. One of the small drainage basins in the Apache Ponds area was cleared of juniper and pinyon when the study was begun in 1957. Unit runoff per unit of area from the cleared basin (190 acres) decreased from nearly 3 times to only 1.7 times that of the uncleared basin (299 acres) during 3 years of observation. Decrease in runoff after the basin was cleared of juniper and pinyon was accompanied by increases in grass and shrub cover.

Measurements of soil moisture in the Cibecue Ridge and Apache Ponds basins are made with a neutron-scattering probe in observation wells as much as 12 feet deep. Preliminary data indicate that the soils are deep enough to store all the moisture that enters them. The moisture is depleted by evapotranspiration. During the first 10 months of observation there was little change in soil-moisture content below the 5-foot depth.

The Cibecue Ridge and Apache Ponds basins derive their soils from the red-brown siltstones of the Supai formation. Small deposits of gravel in the Cibecue Ridge basin resemble lithologically the gravel deposits of Tertiary age on the Mogollon Rim and are believed to have come from that source.

This study has been conducted since August 1957 under the supervision of R. C. Culler. Fieldwork and analysis of data for 1957 were done by D. E. Burkham. Dr. H. C. Fritts, Department of Dendrochronology, University of Arizona, plans to study the relation of tree growth to hydrologic factors on the Cibecue Ridge basins. Vegetation is being studied by F. A. Branson, soils by R. F. Miller, and geology by C. T. Sumsion. Final results of the study are to be published by the U. S. Geological Survey.