A photograph of a dense stand of Eastern Redcedar trees in a grassy field. The trees are dark green and conical in shape, growing in a field of tall, dry grass. The sky is clear and blue.

# Eastern Redcedar

## Invading the Landscape

**The Growing Threat**

**Affecting the environment,  
safety and health**

## Eastern Redcedar – A Growing Threat

Eastern redcedar (*Juniperus virginiana*) is a growing problem in Oklahoma that is threatening the state's economy, human health and safety, wildlife populations and the productivity of our pasture, range and forest land.

The effects that the exploding populations of redcedar is having on the state might be compared to the soil erosion that occurred during the "Dust Bowl" era of the 1930s-40s. It is becoming a problem in almost all counties, and will take years and millions of dollars to bring the spread of cedars under control.

A Redcedar Task Force was formed in 2002 by the Oklahoma Secretaries of Agriculture and Environment to study the problem and make recommendations. The task force report ([www.oda.state.ok.us/forms/forestry/rcstf.pdf](http://www.oda.state.ok.us/forms/forestry/rcstf.pdf)) issued in December 2002 left no doubt of the seriousness of the problem and provided recommendations that must be taken to control it.

Eastern redcedar is by far the most common and widespread juniper in the state, but in some locations other plants identified as cedars or junipers are becoming an equally invasive problem. As used in this publication, the terms cedars and junipers are generally intended to include all of these invasive species including saltcedar (tamarisk) and Ashe, oneseed, Pinchot and Rocky Mountain junipers.

Economic losses alone in 2002 was estimated by the task force to be \$218 million annually and that number will increase to \$447 million by 2013 if the cedar population is not controlled. The USDA Natural Resources Conservation Service (NRCS) estimated that it would take \$157 million to address the current conservation needs involving cedar control.

While there are beneficial uses for cedar, it is the overpopulation that is the concern.

## The Cost to Oklahoma?

The Oklahoma State University (OSU) estimated the economic losses by 2013 if the problem goes untreated and cedars are allowed to increase in numbers at the current rate:

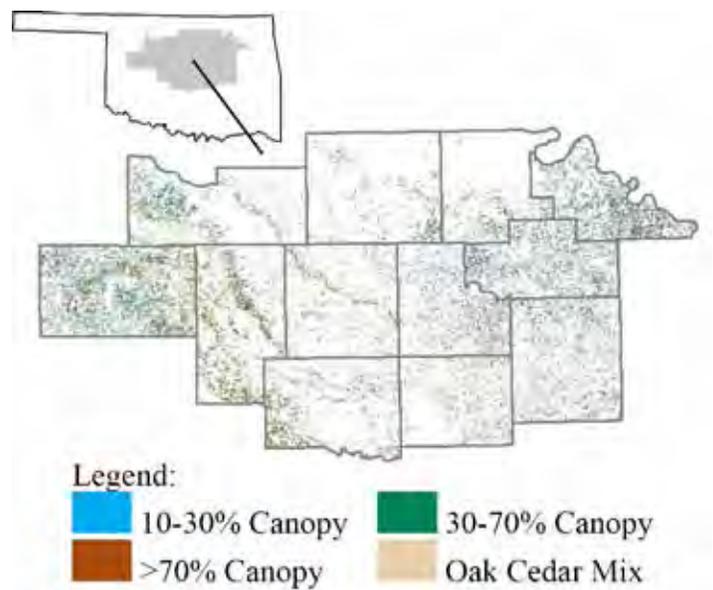
Catastrophic wildfires	\$107 million loss
Cattle forage	\$205 million loss
Lease hunting	\$107 million loss
Recreation	\$17 million loss
Water yield	\$11 million loss
Total loss by 2013	\$447 million

## What Has Caused the Cedar Population Explosion?

Oklahoma has 17 million acres of prairie, shrubland, crosstimbers forests and other forests. NRCS estimates there are eight million acres of these 17 million that are infested with at least 50 redcedars per acre. That is a 400 percent increase in infested acres in the past 50 years. NRCS also estimates that redcedar trees are now increasing in numbers at a rate of 762 acres a day or 300,000 acres each year. By 2013, NRCS predicts 12.6 million acres will be infested by cedar with at least 50 trees per acre, and of those, eight million acres with at least 250 trees per acre.

So how did cedar become such a problem? Prior to settlement of Oklahoma, cedars were restricted to rock outcrops, gullied areas and along streams or canyons. These were areas that were usually protected from wildfires.

Native Americans regularly started fires to burn off areas so that new green plant growth would attract buffalo and other wildlife. Lightning also started wildfires. With settlement came fire control. This allowed the cedars to get a start in the prairies. With birds spreading the seed, soon cedars began to increase.



The redcedar inventory map above, produced as a USDA Natural Resources Conservation Service project jointly funded by the Oklahoma Department of Commerce and Department of Agriculture, Food & Forestry, shows the location and concentration of eastern redcedar tree growth in a dozen central and northwest Oklahoma counties in 2005. Counties included in the map are Blaine, Canadian, Dewey, Garfield, Kingfisher, Lincoln, Logan, Major, Noble, Oklahoma, Pawnee and Payne. Payne County's last inventory in 1984 showed fewer than 500 total acres invested. The 2005 map indicates coverage of the eastern redcedar in Payne County has multiplied to 50,000-plus acres.

## Fire Hazard



The growing population of cedars and increasing number of people moving into rural areas is greatly increasing the risk of loss of property, and perhaps lives, by wildfires.

Cedars are especially a fire hazard because their limbs grow close to the ground and their foliage has a high content of volatile oils. Grass fires can easily set cedars on fire, which can then act as a ladder to spread the fire to the crowns of other tree species. Sparks can also be carried by the wind to rooftops and other areas.

While many people like the privacy of the thick growing evergreen, they often don't realize the fire danger of having them too close to their home.

## Health Issues

Thousands of Oklahomans are allergic to tree pollen and studies have shown that the pollen grain concentrations (allergen) produced by cedar trees tripled from 1988 to 1996.



The amount of cedar pollen will continue to increase as the population of trees increases and they move into new areas. This means millions of dollars will be spent for medicine and doctor visits for allergy problems and the resulting loss of human productivity.

## Loss of Productivity and Land Value

The spread of cedars into rangeland is reducing the productivity of the land and the land values. The cedars shade out and rob water from grasses. As the numbers of cedars and their size increases, land values will continue to decrease due to the cost of removing them.

## Wildlife Effects

An invasive plant like cedar changes the whole ecosystem of an area including altering the habitat for birds and animals.



Research has shown that junipers are a dominant factor in displacing grassland birds and songbirds from the native prairie and as few as three junipers per acre will displace some birds from their habitat. An OSU study shows that Oklahoma could be losing more than 5,000 bobwhite quail coveys per year because of cedar infestation. Cedar infestation has been known to displace an entire turkey flock.

Invasion of cedars in rangeland has the potential to increase predation on grassland birds. In riparian zones, cedars can cause a multitude of problems, including undesirable changes in stream flow dynamics, biological diversity, wildlife habitat and forage production.

## Water Supply

Cedars rob the land of water. OSU research shows that one acre of cedars can absorb 55,000 gallons of water per year. One cedar tree can take up as much as 30 gallons per day. This takes water away from grass and other plants and can reduce groundwater amounts.

The dense foliage of the trees also traps snow and rainfall that often evaporates and never gets into the soil to recharge groundwater.



The spread of cedars reduces land productivity and value

## Control Methods

Currently there are two methods used for cedar control — prescribed burning and mechanical removal of trees using bulldozers, machines with saws or blades, chain saws or tree loppers.



## Prescribed Burning

Prescribed burning is the least expensive cedar control method and it is very effective, especially on trees six feet tall and smaller.

The disadvantages for burning are that there is a small window of opportunity to burn because it requires adequate fuel (grass) and the temperature, wind speed and humidity have to be within acceptable ranges. It also requires labor and equipment.

However, prescribed burning associations are being formed in the state that provide for the sharing of knowledge, labor and equipment in burning.

## Mechanical Treatment



Mechanical treatment is another means of controlling cedar and includes cutting smaller trees with tree loppers or chainsaws, to using specialized machines that have saws or blades to cut small to medium trees, to the use of bulldozers for larger trees. Costs can vary depending on the size of the trees and numbers per acre, but often runs between \$25-\$100 per acre.

## Maintenance

Even after cedars are removed from the land by burning or mechanical means, it doesn't mean the problem is gone. Landowners will need to continue to control new plants. Hundreds of new seedlings can emerge in one year. Cedars can grow at the rate of about one foot in height and one foot in width each year, so it only takes a few years for a tree to get too big to cut by hand.

## What Else Can Be Done

Homeowners can reduce the danger of fires around their homes. Information on this is available from the Firewise website: [www.firewise.org](http://www.firewise.org).

Practicing good land management can prevent cedar infestations. Technical assistance in conservation planning and land management is available from the Natural Resources Conservation Service.

Information on management of forestlands to prevent cedar infestation is available from the Oklahoma Department of Agriculture, Food & Forestry's Forestry Division.

## Help is Available

There are several agencies and organizations that provide information and/or technical assistance in controlling cedars.

Conservation districts and the USDA Natural Resources Conservation Service have offices in every county staffed with professional conservationists that can provide technical assistance. Cost share assistance in controlling cedars may also be available.

Information is also available from OSU Cooperative Extension Service county offices and the Oklahoma Department of Wildlife Conservation.

The following agencies and groups have joined together in a campaign to provide education, recommendations, and technical assistance to Oklahomans to help fight this threat to our state:

- |   |   |
|---|---|
| Association of County Commissioners of Oklahoma | Oklahoma Municipal League                   |
| Commissioners of the Land Office                | Oklahoma Redcedar Association               |
| Department of Agriculture, Food and Forestry    | Oklahoma State Department of Health         |
| Department of Environmental Quality             | Oklahoma State Firefighters Association     |
| Department of Tourism and Recreation            | Oklahoma Transportation Authority           |
| Department of Wildlife Conservation             | OSU Plant and Soil Sciences Department      |
| Oklahoma Association of Conservation Districts  | Ouachita Society of American Foresters      |
| Oklahoma Cattlemen's Association                | Rural Fire Coordinator                      |
| Oklahoma Chapter of the Wildlife Society        | The Nature Conservancy                      |
| Oklahoma Conservation Commission                | USDA Grazinglands Research Laboratory       |
| Oklahoma Department of Transportation           | USDA Natural Resources Conservation Service |
| Oklahoma Farm Bureau                            |   |
| American Farmers & Ranchers                     |   |
| Oklahoma Insurance Department                   |   |

This publication, printed by the GALT Foundation of Oklahoma City, Okla., is issued by the Oklahoma Conservation Commission as authorized by Mike Thralls, Executive Director. Copies have been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries. Five thousand copies were printed at a cost of \$0.28 each. All programs and services of the Oklahoma Conservation Commission and Oklahoma's Conservation Districts are offered on a nondiscriminatory basis without regard to race, color, national origin, religion, gender, marital status or physical disability. August 2008-MH