

Riparian Zone Habitats

Levels of Encroachment	Recommended Treatment and Cost/Acre
No cedar	Fire A \$10
<6 feet tall <250 trees/acre	Fire B \$10 Mech A \$25
6 to 20 feet tall 250 trees/acre	Mech G \$100
>20 feet tall >250 trees/acre	Mech G \$150

Treatment Options ^a	Specific Treatment Descriptions ^{b,c}
Fire:	A - Prescribed burning every 3 - 5 years B - Prescribed burning with hand ignition to kill residual trees C - Prescribed burning: helicopter ignition with helitorch D - Prescribed burning: helicopter ignition with helitorch & paraquat E - Prescribed burning: helicopter ignition with ping-pong machine (DAID) F - Prescribed burning with hand ignition followed by individual tree ignition G - Prescribed burning with hand ignition followed by mechanical
Mechanical:	A - Hand tool (lopper, bow saw, axe, chain saw) B - Tractor or bobcat with hydraulic clipper C - Cedar hydraulic saw D - Bulldozer (pie shaped saw, push blade) E - Two bulldozers with 6-foot ball and two 100-foot-long anchor chains F - Mechanical E with follow-up using Fire A G - Remove cut trees from riparian zone; follow with Fire A
Herbicide:	Velpar or picloram (individual tree treatment)

^a After all initial treatments, prescribed burning should be repeated every 3 to 5 years to maintain the site.

^b Reseeding after treatment is unnecessary, cost prohibitive, and usually destructive.

^c Does not include firebreak preparation or maintenance.

Other Considerations

Fire and Mechanical – Burn before mechanical treatment. This will reduce spotfire risks and mechanical costs.

Piling Brush – Do not pile redcedar after cutting. Leave cedar where they lay after cutting to facilitate the fire that will follow. Piles of burning redcedar give off fire brands that travel hundreds of feet downwind, causing spot fires.

Reseeding – Once redcedar is cut or burned, it is unnecessary to reseed the area. Native grasses, forbs, legumes, and woody plants will recover rapidly with adequate rainfall and proper grazing management. Otherwise, recovery will take longer, but the area will still re-colonize with native plants.

Grazing Management – None of the control options listed will work without proper grazing management. The plant community cannot be restored without a proper stocking rate and periodic fire, and fire cannot be used without adequate fine fuel (dead grass).

Firebreaks – Refer to OSU Fact Sheet NREM-2890.

Summary

The invasion of redcedar and other fire-intolerant junipers into prairies, shrublands, and forests is a direct result of fire suppression. Redcedar and other junipers are indicators of poor land management and ecosystem dysfunction. Their presence on the landscape has a negative impact on water quality, air quality, public safety and health, wildlife, and agriculture. It can cause catastrophic wildfires. Redcedar has been identified as the number one conservation concern by the State Technical Committee for USDA Cost Share Programs. The Best Management Practices described in this fact sheet can be applied throughout Oklahoma and surrounding states. The prescriptions will fit almost any land management goal and are supported by research findings. A variety of state and Federal cost-share programs exist to assist landowners with juniper control.



Eastern Redcedar Control and Management – Best Management Practices to Restore Oklahoma’s Ecosystems

Terrence G. Bidwell
Professor and Extension Specialist
Rangeland Ecology and Management

John R. Weir
Research Range Superintendent
Rangeland Ecology and Management

David M. Engle
Professor, Natural Resource Ecology and Management and
Director, DASNR Water Research and Extension Center

From research reports and experience with a variety of control methods, we compiled a list of best management practices (BMPs) for controlling eastern redcedar and ashe juniper. The overriding BMP is to prevent encroachment of redcedar trees by using frequent, low-cost **Ecosystem Maintenance** methods such as prescribed fire. On the other hand, **Ecosystem Restoration**, converting stands of redcedar back to native plant communities, requires intensive high-cost inputs.

No single practice is ideal for every parcel of land, but fire is a natural event that is necessary if the land is to remain healthy. Prescribed fire is the most environmentally appropriate and cost-effective practice for maintaining ecosystems in prairies, shrublands, and forests. For ecosystem restoration,

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prescribed fire is still the most appropriate practice but usually must be used in conjunction with other practices such as mechanical treatment. However, the high intensity fire necessary for restoration may carry greater risk and costs more than the low intensity fire used to maintain ecosystems.

In the tables on the following pages, we list BMPs by habitat type, level of encroachment (i.e., tree density and size), and spatial scale (i.e., land area in acres) of the target area. The lower levels of encroachment (e.g., for prairie and shrubland habitats, the “no cedar” and “<6 feet tall <250 trees/acre”) can be considered for ecosystem maintenance methods. Higher levels of encroachment require ecosystem restoration methods.

Specific information on these BMPs is available from OSU Cooperative Extension, USDA Natural Resources Conservation Service, USDA Forest Service, Oklahoma Department of Wildlife Conservation, Oklahoma Division of Agriculture Forestry Services, The Nature Conservancy, and the USDI Fish and Wildlife Service.



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Prairie and Shrubland Habitats

Levels of Encroachment	Scale of Target Area for Maintenance or Restoration (Acres)			
	160 acres or less	160 - 640 acres	640 - 5,000 acres	>5,000
	Recommended Treatment and Cost/Acre			
No cedar	Fire A \$10	Fire A \$7	Fire A \$5	Fire A \$3
<6 feet tall <250 trees/acre	Fire B \$10 Mech A \$25 Mech G \$20 Herb \$40	Fire B \$7 Mech G \$20	Fire B \$5 Fire C \$10 Fire E \$15	Fire B \$3 Fire C \$10 Fire E \$5
6 to 20 feet tall 250 trees/acre	Fire F \$15 Fire G \$20 Mech B \$50 Mech C \$80 Mech D \$109 Mech E \$11 Mech F \$21	Fire F \$12 Fire G \$17 Mech B \$50 Mech C \$50 Mech D \$90 Mech E \$11 Mech F \$18	Fire G \$17 Fire C \$10 Fire E \$15	Fire G \$15 Fire C \$10 Fire E \$5
>20 feet tall >250 trees/acre	Fire D \$25 Mech F \$160	Fire D \$25 Mech F \$18	Fire D \$20 Mech F \$16	Fire D \$20 Mech F \$16

Treatment Options ^a	Specific Treatment Descriptions ^{b,c}
Fire:	A - Prescribed burning every 3 to 5 years B - Prescribed burning with hand ignition to kill residual trees C - Prescribed burning: helicopter ignition with helitorch D - Prescribed burning: helicopter ignition with helitorch & paraquat E - Prescribed burning: helicopter ignition with ping-pong machine (DAID) F - Prescribed burning with hand ignition followed by individual tree ignition G - Prescribed burning with hand ignition followed by mechanical
Mechanical: (Do not pile)	A - Hand tool (lopper, bow saw, axe, chain saw) B - Tractor or bobcat with hydraulic clipper C - Cedar hydraulic saw D - Bulldozer (pie-shaped saw, push blade) E - Two bulldozers with 6-foot ball and two 100-foot-long anchor chains F - Mechanical E with follow-up using Fire A G - Mow or Shred
Herbicide:	Velpar or picloram (individual tree treatment)

^a After all initial treatments, prescribed burning should be repeated every 3 to 5 years to maintain the site.

^b Reseeding after treatment is unnecessary, cost prohibitive, and usually destructive.

^c Does not include firebreak preparation or maintenance.

Oak-Hickory, Oak-Pine, and Post Oak-Blackjack Oak Forest Habitats

Levels of Encroachment	Scale of Target Area for Maintenance or Restoration (Acres)			
	160 acres or less	160 - 640 acres	640 - 5,000 acres	>5,000
	Recommended Treatment and Cost/Acre			
No cedar	Fire A \$10	Fire A \$7	Fire A \$5	Fire A \$3
Understory cedar	Fire B \$10 Mech A \$25 Herb \$40	Fire B \$7	Fire B \$5 Fire C \$10 Fire E \$15	Fire B \$5 Fire C \$10 Fire E \$15
Midstory cedar	Fire F \$15 Fire G \$20 Mech A \$25 Mech B \$50 Mech C \$40	Fire F \$12 Fire G \$17 Mech B \$50 Mech C \$40	Fire G \$17 Fire C \$10 Fire E \$15	Fire G \$15 Fire C \$10 Fire E \$15
Overstory cedar	Fire D \$25 Mech A \$25 Mech F \$21 Mech G \$100	Fire D \$25 Mech F \$18 Mech G \$75	Fire D \$20 Mech F \$16	Fire D \$20 Mech F \$16

Treatment Options ^a	Specific Treatment Descriptions ^{b,c}
Fire:	A - Prescribed burning every 3 to 5 years B - Prescribed burning with hand ignition to kill residual trees C - Prescribed burning: helicopter ignition with helitorch D - Prescribed burning: helicopter ignition with helitorch & paraquat E - Prescribed burning: helicopter ignition with ping-pong machine (DAID) F - Prescribed burning with hand ignition followed by individual tree ignition G - Prescribed burning with hand ignition followed by mechanical
Mechanical: (Do not pile)	A - Hand tool (lopper, bow saw, axe, chain saw) B - Tractor or bobcat with hydraulic clipper C - Cedar hydraulic saw D - Bulldozer (pie-shaped saw, push blade) E - Two bulldozers with 6-foot ball and two 100-foot-long anchor chains F - Mechanical E with follow-up using Fire A G - Selective dozing followed by Fire A
Herbicide:	Velpar or picloram (individual tree treatment)

^a After all initial treatments, prescribed burning should be repeated every 3 to 5 years to maintain the site.

^b Reseeding after treatment is unnecessary, cost prohibitive, and usually destructive.

^c Does not include firebreak preparation or maintenance.