SOCIETY OF AMERICAN FORESTERS
GREAT PLAINS

Eastern Redcedar on the Great Plains

A Position of the Great Plains Society of American Foresters (GPSAF)

This position statement was initially adopted by GPSAF in 2020 and revised in 2026.
This will expire in 2031, unless, after subsequent review, it is further extended by the GPSAF Executive Committee.

Purpose: In support of a science-based and proactive approach to appropriate establishment, sound management, and effective control of eastern redcedar on the Great Plains.

Scope: Management of public and private lands throughout the Great Plains which benefit from eastern redcedar windbreaks or are threatened by undesired encroachment from eastern redcedar seedlings.

Position

The Great Plains Society of American Foresters (GPSAF) recognizes that the subject of eastern redcedar (*Juniperus virginiana* L.) presence on the Great Plains is a complex and nuanced matter, and meaningful resolution to this concern must include cooperation from partners across the natural resource professional spectrum. Just as the ecosystems vary across the gradient of the Great Plains region, so must the appropriate place for eastern redcedar.

GPSAF recognizes the threat of eastern redcedar encroachment and establishment in grasslands and woodlands, but GPSAF also supports the need for wise use of this native tree for its quantifiable benefits to the rural landscape and agriculture. A pragmatic balancing of these realities, based on the best available science and practice, is needed to achieve net positive outcomes for threatened resources and ecosystems, agricultural production and farmstead benefits, and a positive working relationship across natural resource disciplines and land ownerships.

At this time, GPSAF believes that the science supports the following; that neither an outright ban on the planting of eastern redcedar, nor an unqualified endorsement of this species as a conservation solution, would be appropriate or advisable.

Specifically, as a collection of professional natural resource managers, GPSAF supports:

- An integrated approach to eastern redcedar management, recognizing that there is no single solution.
- Preventing opportunistic eastern redcedar establishment in grassland, prairie, savanna, and woodland settings through active land management practices including prescribed fire where and when appropriate.
- Efforts on active eastern redcedar management in grassland, prairie, savanna, and woodland settings, including use of prescribed fire and mechanical thinning where and when appropriate.
- Fire fuels reduction through reducing eastern redcedar density and encroachment, especially where wildland-urban interface (WUI) exists.
- Continued wise and appropriate establishment of eastern redcedar (and its selections and cultivars) for conservation purposes where prevention management practices are in place, or there is not a risk of potential spread into large units of grasslands or native hardwood stands.
- Expanded opportunities for utilization of eastern redcedar of all sizes of trees, for lumber, posts, mulch, biomass energy, and other valuable products, preferring high-value utilization first.

Issue

Eastern redcedar, (*Juniperus virginiana* L.) is a conifer native to the eastern portion of North America, reaching west to include the Great Plains (Van Haverbeke et al., 1976). It is the only native coniferous tree to Kansas and eastern Nebraska. Eastern redcedar (ERC) trees are relied upon in areas of low rainfall and poor soils as the primary evergreen tree suited for conservation plantings for farmstead, field, and livestock protection. In some portions of the western Great Plains, ERC is often the only well-adapted and appropriate choice for the evergreen component in conservation plantings. In addition, ERC is used in wildlife plantings for winter protection, and in living snowfences to reduce snow drifting on roads. ERC is also a timber resource and can be harvested for wood products of sawlogs, posts, shavings and chips.

These long-recognized benefits must be considered in relation to the negative impact that ERC can have on rangeland, as well as prairie and woodland ecosystems. Succession from grassland to ERC thicket has many negative outcomes, including a reduction in usable forage for livestock and increased intensity and changed behavior of wildfires. Without active management in prairie and woodland ecosystems, opportunistic ERC encroachment can outcompete other native plants leading to a loss in plant diversity, ecosystem functionality, and wildlife habitat. For a variety of reasons, ERC encroachment has expanded quickly in recent decades and is one of the most critical issues facing natural resource management on the Great Plains today.

There has been much contention surrounding the appropriate place for ERC in the Great Plains, between well-intentioned natural resource professionals, public and private landowners, public agencies, and private NGOs. It is not the intention of this Position Statement to fully resolve these differences, but instead to clarify and expand on the nuances of the appropriate roles, contexts, uses, and management of ERC on the Great Plains.

Background

Historically, cultural burning practices by Native Americans and lightning-ignited fires across the Great Plains limited the extent and occurrence of ERC. However, since the settlement era in the late 1800s and early 1900s, there has been a "fire-control" or fire-suppression philosophy that has removed one of the natural checks that confined ERC to low-lying rocky areas. Fire control and suppression policy allowed ERC to become established, grow, and produce an abundant seed source in areas such as pastures, prairies, and woodlands that would have otherwise been kept largely free of woody vegetation by periodic fire (Smith, 1986).

In the same period of time, especially since the 1930s Dust Bowl era, ERC and other tree species were widely planted across the Great Plains for conservation purposes. The evergreen element of a windbreak, particularly ERC, is a critical component for effectiveness. As diseases such as pine wilt removed otherwise well-adapted species such as Scotch pine and Austrian pine from Great Plains windbreaks, in many parts of the region only ERC remained as a well-adapted option for protecting homes, crops, and livestock (Ganguli et al., 2008).

Since 1965, the volume of ERC in Kansas has increased more than 15,000 percent within its native range (Moser et al., 2013), mostly through conversion of grassland and rangeland where fire has been excluded. On properties within regions routinely managed with prescribed fire, such as the tallgrass prairies of the Flint Hills, eastern redcedar has not become a nuisance species.

In Nebraska, a 2015 inventory evaluation showed that eastern redcedar constituted more than 333,000 acres, approximately 22% of Nebraska's overall forest acres. Average annual rates of spread from 2005 to 2010 were approximately 25,000 acres per year of grasslands converted to ERC thicket, and 13,000 acres per year of existing forest being converted to ERC. Since 2009, this rate has slowed. ("Eastern Redcedar in Nebraska: Nebraska Conservation Roundtable").

Impacts and Risks

ERC encroachment and landscape conversion has created multiple concerns, including reduced forage production (Engle et al., 1996), increased fire danger (Twidwell et al., 2013), loss of wildlife habitat (Frost et al., 2011), changes to hydrology (Twidwell et al., 2013), stress on hardwood forests (Galgamuwa et al., 2020), and reduced native vegetation diversity (Limb et al., 2010).

ERC foliage contains volatile oils, causing it to ignite and burn easily. Its structure brings foliage into direct contact with grasses, acting as ladder fuel to transition grass fire into crown fire. ERC burns extremely hot, and flame heights of 50 feet are not uncommon (Wright et al., 1978). As this species burns, it produces ember showers, inducing spot fires, which help the fire spread quickly (Beam, 2023). Homes in the vicinity of ERC expansion are at a greater risk of damage from wildfire due to flame intensity and traveling embers. (Weir et al,. 2017)

Benefits

ERC seeds are high in fat, fiber, and carbohydrates, and are an important winter food source for many birds and mammals, including many game animals. ERC is also an important roosting and cover site for a variety of wildlife. (Horncastle et al., 2005)

Today, there are approximately 30,000 miles of windbreaks in Kansas alone, protecting more than 1.2 million acres of land and roughly 65,000 homes and farmsteads. It is estimated that these windbreaks, many of which are composed primarily of ERC, contribute $50-60 million in value to Kansans annually. (Armbrust 2026) According to a 2018 study, within 1.8 million acres of windbreaks studied in the Great Plains (Kansas, Nebraska, South Dakota, North Dakota) there are about 40 million ERC trees, with most occurring in Nebraska (17 million) and Kansas (14 million), respectively (Meneguzzo et al., 2018).

In field windbreaks, ERC provides sheltering, which increases crop yields (Osorio et al., 2018). Compared to other species, it can tolerate incidental herbicide drift. Other evergreen species have been tested as a substitute for ERC in windbreaks, but have experienced minimal success due to long-term survivability, adaptability, and disease challenges.

While ERC is a critical asset in windbreaks, monitoring and management of the windbreak and adjacent area is needed to maintain functionality and prevent encroachment into at-risk areas.

Beyond the value that ERC windbreaks provide to rural and agricultural operations, this species also has real and potential value as both timber and biomass fuel.

While current market rates for ERC timber and lumber vary across the Great Plains, local markets reflect high value placed on ERC products. One sawmill in Nebraska is currently direct-marketing a variety of rough-sawn ERC lumber such as wall boards, timbers, paneling, and more, starting at $6.50 per board foot. In 2014, the most recent year data can be verified, Nebraska sawmills produced 870,000 board feet of sawlog products, and 61,000 feet of fence posts, equivalent to 105,000 four-inch diameter fence posts. (Nebraska Forest Service)

In addition, assessments have found that "the use of eastern redcedar as biofuel is a viable source of energy and there is promise for future prosperity in this field." (Greve et al. 2012). Its value as a biofuel may further incentivize utilization, thereby encouraging the removal of ERC thickets and promoting landscape restoration.

Management

The linkage between management choices and vegetation outcomes on the landscape is widely accepted on the Great Plains. (Briggs et al., 2002) Factors such as urban development and landscape fragmentation have contributed to the aggressive expansion of ERC but altered fire regimes are the primary cause of such drastic ecosystem change (Ratajczak et al., 2014). Ultimately, responsibility for management is incumbent on the landowner, but this responsibility can be effectively supported by multiple partnerships.

Integrated management should be based on a combination of cultural, mechanical, biological, and chemical methods to keep ERC from spreading. Regardless of the methods used, it is best to control the plant when it is young. One of the most effective and economical methods of controlling ERC is prescribed fire. "Prescribed burning is the most natural and cost-effective way to remove and prevent brush and trees in grasslands." (Kansas Department of Agriculture, 2026) ERC does not resprout when top-killed by fire or when the above-ground green growth is completely removed. A five-year burn cycle is beneficial for pastures with sufficient fuel load, as the fire will effectively consume up to eight-foot ERC saplings. A three to five-year burn cycle may maintain ERC absence in a grassland (Bidwell et al., 2017), but it may not be frequent enough to stop the expansion of other woody species that resprout. However, this interval may not be necessary for all regions of the Great Plains. Western areas may benefit from burning every seven to 10 years.

ERC does not have the ability to resprout if no green foliage remains. Hand removal is quick and simple if done on a one- to three-year cycle. Removal of female ERC is a method to reduce seed dispersal on grassland areas, but not in windbreaks. ERC is dioecious, meaning there are separate male and female trees. Only female trees bear seeds cones, which are usually produced beginning at about 10 years of age (Van Haverbeke et al., 1976). Seeds are dispersed primarily by birds, with a significant amount distributed within a short distance from the mother tree (Holthuijzen et al., 1987). Seeds are viable for only a short time, and do not accumulate in the soil seed bank (Holthuijzen et al., 1984).

The volume of ERC contained in the Great Plains is substantial. According to U.S. Forest Service Forest Inventory and Analysis (FIA) data, there is more than 8.9 million tons of ERC wood in Nebraska and 2.8 million tons in Kansas. Markets to incentivize harvest of this biomass would likely result in increased rates of removal from areas where these trees are problematic (Baker et al., 2017).

Definitions

While ERC is sometimes described as an "invasive species," by generally accepted standards this native tree cannot meet that definition. In the United States, invasive species are defined through Executive Order 13751 as "a non-native organism whose introduction causes or is likely to cause economic or environmental harm, or harm to human, animal, or plant health" (Executive Order 13751, 2016).

Instead of meeting this definition of "invasive," ERC must instead be seen as a native tree in need of active management, especially in areas where encroachment is undesirable. This species has real and quantifiable benefits in locations where it is highly functional, but like all natural systems, will not have desirable or stable outcomes when elements such as management by fire (or mechanical means) are excluded. It would be appropriate to refer to ERC, especially seedlings in rangeland, as a nuisance species, opportunistic, a woody encroacher, a weedy tree, or even an aggressive colonizer species. Accepted academic definitions of "invasive species" categorically exclude a native species like ERC from being termed "invasive." (Myers & Bazely, 2005).

It is worth noting that this terminology matters, as terminology informs appropriate response and management of the species in question. (Radosevich et al., 2007) While a consensus on the definitions of these words may never be able to be reached (Richardson et al., 2000), most authorities agree that "invasive" plants have negative impacts that far outweigh any benefits – a description that does not suit ERC and its net effect on the Great Plains.

Rather than ERC itself possessing unique "invasive" traits that create a competitive advantage over the preferred vegetation on sites where ERC encroachment has become advanced, it may be reasonable to credit this establishment to a human-caused facilitation through management choices.

When suppression by fire (or mechanical means, where prescribed fire cannot be implemented) is lacking, increased density of ERC is necessarily a result of management, not of inherent characteristics of the species itself (Bidwell et al. 2017). In practice, this can be observed where significant ERC stands are present on one side of a fenceline, while few to no ERC seedlings or saplings persist on the other side. It is reasonable to conclude that it is not the fenceline that has determined whether ERC is present; presence is instead determined by the change in land ownership and management on opposite sides of the fence. This phenomenon is well-studied in the literature, as a facilitation of succession rather than an invasion. (Randall, 1997)

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