2018

COMMITTEE ON NATURAL RESOURCES

NEBRASKA LEGISLATURE

LR 387

Interim Study Report

Interim study to examine issues relating to the spread of Eastern Redcedar Trees

ONE HUNDRED-FIFTH LEGISLATURE

SECOND SESSION

NATURAL RESOURCES COMMITTEE MEMBERS

Senator Dan Hughes, Chairperson
Senator Bruce Bostelman, Vice-Chairperson
Senator Joni Albrecht
Senator Suzanne Geist
Senator Rick Kolowski
Senator John McCollister
Senator Dan Quick
Senator Lynne Walz

LR 387

NATURAL RESOURCES COMMITTEE

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MEMORANDUM

TO: NATURAL RESOURCES COMMITTEE MEMBERS
FROM: SEN. DAN HUGHES, CHAIRMAN
DATE: NOVEMBER, 2018
SUBJECT: LR 387

The Natural Resources Committee held a public hearing on August 31, 2018, in Lincoln, Nebraska, on LR 387. I introduced the resolution in response to interest expressed by a working group of agricultural, water resources and conservation associations about the spread and management of Eastern Redcedar (ERC) trees in the state.

The committee held a public hearing to provide organizations and individuals an opportunity to tell the legislature of their challenges with the spread of ERCs. It also allowed all participants to learn what actions others are taking to manage the spread of ERCs in their areas. The committee invited expert testifiers to share the latest developments from their respective organizations. Invited testifiers included representatives from the University of Nebraska, Natural Resources Conservation Service, the Game and Parks Commission, the Nebraska Forest Service, the Nebraska Prescribed Fire Council, Nebraska Board of Educational Lands and Funds, and the natural resources districts.

The attached hearing transcript and correspondence provide a comprehensive picture of the state of Nebraska's ERC issue. I scheduled the public hearing because I thought it would be helpful to educate committee members on the issue and the challenges associated with ERC management. I asked testifiers to include in their testimony what, if any, possible legislative solutions they would recommend. Testifiers provided background information and exposed the committee to a myriad of options and opinions on how Nebraskans should be addressing ERC problems. At this time, however, no legislative action has been requested or planned for the 2019 legislative session.

It is clear that Eastern Redcedar is an affordable, effective windbreak that has been and continues to be used all over the state. The problems arise when the trees begin encroaching on land that is used for other useful purposes and management actions are not properly taken. The consequences of inefficient and untimely management can be disastrous and expensive. Some would prefer that the use of ERCs be prohibited, while others strongly disagree and plan to continue using the tree as needed. All, however, agreed that each user of the tree must be responsible for its proper management and must work with adjacent landowners to ensure the spread of the tree does not cause harm. I believe the hearing provided an opportunity for all parties to understand the views of others, to identify resources, and to get an update on the work that this being done to address the problem.

The attached documents were provided to senators at the public hearing and provide a

wealth of research, background and descriptions of the work being done statewide to address problems with Eastern Redcedar trees.

Natural Resources Committee August 31, 2018 Room 1525

Rough Draft

HUGHES: [00:00:00] Everyone, according to my phone we're at 1 o'clock. So welcome to the Natural Resources Committee. I'm Senator Dan Hughes, I am from Venango, Nebraska, and I represent the 44th Legislative District. I serve as chair of this committee. Today we are hearing testimony for LR387, an interim study to examine issues relating to the spread of eastern redcedar trees. The purpose of this hearing is to gather information for the committee. No positions of support or opposition are taken. I ask that you abide by the following procedures to better facilitate today's proceedings. Please silence or turn off your cell phones. If you are planning to testify, please pick up a green sheet, green sign-in sheet on the table in the back of the room. Please fill out the green sign-in sheet before you testify. Please print and it is important to complete the form in its entirety. When it is your turn to testify, give the sign-in sheet to the committee clerk or to a page. This will help us make a more accurate public record. If you do not wish to testify but would like your name entered into the official record as being present at the hearing, there is a separate white sheet on the tables that you can sign in for that purpose. This will be part of the record of the public-- the official record of the hearing. Written materials may be distributed to committee members as exhibits only while testimony is being offered. If you have handouts, please make sure to have 11 copies and give them to a page to distribute to the committee. When you come up to testify, please speak clearly into the microphone. Tell us your name and please spell your first and last names to ensure we get an accurate record. We appreciate all the representatives of various groups who have been working on the eastern redcedar issue that are here to provide information to the committee on this issue. There are-- these are the committees invited testifiers and each of them will have five minutes to present. After the invited testimony we will take testimony from the public and allow five minutes per testifier. When you see the yellow light come on that means you have one minute remaining. The red light indicates your time has ended. Questions from the committee may follow.

Another reminder, no displays of support or opposition to the bill vocal or otherwise is allowed at a public hearing. The committee members with us today will introduce themselves beginning on my left.

KOLOWSKI: [00:02:24] Rick Kolowski, District 31 in southwest Omaha.

QUICK: [00:02:29] Dan Quick, I represent District 35: Grand Island.

WALZ: [00:02:32] Lynne Walz. I represent District 15, which is all of Dodge County.

HUGHES: [00:02:36] And on my right.

BOSTELMAN: [00:02:38] Bruce Bostelman, District 23: Saunders, Butler, and Colfax Counties.

HUGHES: [00:02:42] To my left is committee legal counsel, Laurie Lage. And to my far right is the committee clerk, Mandy Mizerski. Our pages for the committee today are Heather Bentley and Greg Tracey. So thank you for coming. So with that, we will begin. We do have a list of invited testifiers and there is an order in which they will testify. And when we have gotten through those, I will open it up to anyone else who would like to testify. This issue came was brought to my attention by a few different groups that wanted to talk about this issue. And by the amount of people that have shown up on a Friday afternoon in Lincoln there it tells me that there is a problem out there that we certainly need to look at and try to see if we can find ways to mitigate the issue. So I appreciate everybody showing up and your willingness to participate and share the knowledge that you have. So with that, I will invite our first testifier, Dr. Dirac Twidwell. Did I get that? How bad did I murder it? Okay. I murdered it pretty good?

DIRAC TWIDWELL: [00:03:54] You did as well as you'd expect.

HUGHES: [00:03:59] Thank you for coming and welcome.

DIRAC TWIDWELL: [00:04:10] So it's Dirac Twidwell, D-i-r-a-c T-w-i-d-w-e-l-l. Good afternoon, Senators, Chairman Hughes, and the Natural Resources Committee. I'm Dirac Twidwell, an associate professor at the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln. My research program specializes in large-scale resilience science and understanding why regional transitions are occurring in rangelands and forests. I also work with national and international research teams to study the extremes of fire and drought and how they are changing in the 21st century. As a scientist, I report on how systems change so I have a neutral position on this issue. My role has been to provide input to diverse landowner and agency networks for informed science decision making. The conversion of grassland regions to eastern redcedar dominance is one of the most well understood changes in rangeland science. New rangeland inventory technology shows that the amount of rangeland converted to tree dominance has doubled in Nebraska since 2000. Trees in rangelands are now approaching one million acres and Nebraska is considered to be in the early stages of the transition process. Other states such as Texas, Oklahoma, and Kansas are dealing with this issue as well. All states show a continued inability to halt a trend where rangelands are lost to woody plant dominance. The consequences of this conversion have been an area of major scientific investigation and I will highlight the most important findings here. The science has established with absolute certainty the following when grasslands transition to juniper woodland: 75 percent declines in livestock production are consistently documented as a result of collapses in grassland productivity. Wildfire suppression tactics become ineffective. Virtually all grassland dependent bird, small mammal, insect, and plant species are displaced, increasing the potential for threatened and endangered species. Lost revenue generated for Nebraska public school funding for the Board of Education land and trust. Additional known consequences

include future decreases in water yield but impacts are uncertain in Nebraska and this is an area of current research at UNL. Preliminary estimates of the statewide economic vulnerability to grazing lands have also been developed and those are being refined at UNL. These consequences are primarily owed to two major challenges and changes in grassland systems: human to bird dispersal of trees into grasslands and the elimination of indigenous fire ignitions. Decades ago, many scientists considered eastern redcedar to be a species that could be introduced to a new area where the population would not be self-sustaining and spread. This is referred to as an inventive species. However, some inventive species become naturalized and then invasive. Eastern redcedar is one of those species. Thus, the risk posed by eastern redcedar have flipped over the past century. Tree plantings introduced into grasslands today serve as seed sources for the spread of new cedar trees into environments where they were previously foreign and the costs of mechanical removal have prevented this management practice from being practical on large landscapes and keeping pace with the rate of cedar spread. Many ranchers throughout the Great Plains have therefore turned to prescribed fire but there are sociopolitical barriers to its use and therefore has limited application as well. The outcome is that not enough land area is being managed with mechanical or fire treatments to keep pace and rangelands of the Great Plains with the rate at which they are transitioning to woody plant dominance. Where these impacts will be realized in Nebraska and when they will occur depend on management and policy and how it's adapted to sustain rangeland resources. Policy assessments have been conducted in the sites. They demonstrate how existing policies and management practices are not being implemented in a manner capable of halting the regional trend of eastern redcedar invasions. As a result, other states have underinvested at low levels of infestation and overinvested after environmental consequences have become realized. Key scientific principles from invasion-- invasion ecology encourage policies that do not distribute invasive species in areas where environmental consequences outweigh potential benefits. These policies have a track record of success and are shown to be more cost-effective. Only one group in the Great Plains has demonstrated the capacity to stabilize a region following the onset of exponential growth

in eastern redcedar. This is the result of a unique partnership in the Loess Canyons of Nebraska where landowners, scientists, and agencies including Nebraska Game and Parks, Pheasants Forever, and the Natural Resource Conservation Service have leveraged resources in new ways to attempt to scale up eastern redcedar control. And this region provides the first scientific evidence for sustainable rangeland management in areas where there's high amounts of eastern redcedar cover in the Great Plains. Last year, my research group released the most comprehensive resource on the spread and impacts of eastern redcedar to the public domain, the Eastern Redcedar Science Literacy Project. It's available on-line. An additional report has been generated from this information, along with new scientific information from Nebraska to answer many of the common questions people have known the causes, consequences, and challenges associated with eastern redcedar and its spread into areas where it was previously foreign. Many of the same questions are posed in this legislative resolution and I have provided that report to the committee for your reference. Thanks for your time and attention on this important natural resource issue. I see the end of my testimony.

HUGHES: [00:09:27] Okay. Thank you, Dr. Twidwell. Questions from the committee? Senator Bostelman.

BOSTELMAN: [00:09:32] Thank you. Thank you for coming to testify today, doctor. I guess initial question would be what are the practices that have been tried, that have worked? In what stage in growth, hasn't been tried and worked? What's reasonable to expect for an outcome to be successful at managing the problem or issue that you're addressing, that we're talking about? If it is a problem.

DIRAC TWIDWELL: [00:09:58] Yeah, thanks for the question. So since the 1950s in range management there was particular mechanical, chemical, and fire were your tools that were your brush management tools. Those were identified as best practices in range management. What we

have here is those best management practices work very well on small acreages. And until now we haven't had the technology to look at more regional and statewide trends. So when we look at success stories where we've done management, we're ignoring the regional trend and then that makes that mechanical or chemical or fire harder and harder to keep pace with invasions. So those best management practices we now know today are not the best management practices for sustaining regional and state resources. The science is currently working on what else can we do to scale up. So an example is preventative management, it has not been implemented at regional scales. So we introduce seeds into certain areas and the same time as we try to control them. That works for inventive species that don't self-propagate and spread. We're struggling to deal as a society with the fact that these are now rapidly changing. It took so long to get them established in places like the Sandhills and we now have lots of evidence that they're spreading well past where people previously thought, including scientists. So the answer to your question isn't how difficult, it is how to scale up to manage actual regions. There has not been a state that has implemented best practices or tried to identify best practices that worked at regional scales and prevent this from happening. As a result, they overinvest later. And there was no evidence until the Loess Canyons of Nebraska where you could actually see it exponentially increasing and then stabilize. It's the only place we know, and that's 330,000 acres. We're talking about a much bigger land area. So we are coming out with best-- not best practices, we coming out with technical guidance for policy on how to scale that up. What are things that could be tried?

BOSTELMAN: [00:11:58] One follow up question. I talked to an individual I met this summer who does logging and has done logging out in that area. One of the challenges he sees there is when you go in and log out an infested area that has large cedars that they're interested in then the problem you have is you have-- if it rains they've got all the soil is going away, there is nothing to hold the soils. Can you talk about that if there's anything in there that follows up if there is a logging or if a fire or whatever goes through an area? Now you've got these canyons and stuff that if you get

a lot of erosion happening once we have a rain that, you know, hopefully would come soon.

DIRAC TWIDWELL: [00:12:37] Right.

BOSTELMAN: [00:12:37] But there's a soil erosion problem on the backside of this thing too.

DIRAC TWIDWELL: [00:12:42] So that's been one of the major concerns throughout the Great Plains is that there are certain management treatments, mechanical or fire, that could lead to those erosion. What we see in the Great Plains is a very site-specific erosion type of challenges, like after the Niobrara wildfire there was that big flush of soil loss, mass soil loss that occurred. When we're looking at a lot of prescribed fires, including a lot of regional prescribed fires, even in more of the Loess Hills and Loess Canyons area where there's more topography, we now have data that shows how rapidly grass comes back. In fact, on the Niobrara Valley Preserve owned by TNC we just published this year showing that in our worst drought conditions recorded with the most intense fires there was a wildfire that happened. We saw no difference in biomass and there was not that soil erosion everybody feared for the Sandhills, which is considered to be the most sensitive of all the prairie regions and the Great Plains. Consistently we do not see that long-term soil erosion loss. Grass-- eventually grassland plants tend to come back and win. But there are places where you will get localized soil erosion and distribution of soil movement. But we don't see the large-scale destabilization type of fears.

BOSTELMAN: [00:13:57] Thank you.

HUGHES: [00:14:02] Are there areas of the state that you feel we shouldn't be planting eastern redcedar that is not already have trees-- have trees in place that would-- that can become a problem?

DIRAC TWIDWELL: [00:14:18] So as a scientist definitely, especially in a private land state, I definitely never tell groups what to do. But I give feedback on what the benefits or consequences could be. So one of the main scientific principles is that we should look at the scientific evidence and see if we're going to introduce this plant to an area what are the potential risks versus the potential gains? Because it was introduced initially for wind management and we're seeing all these other costs play out. In areas where people are most dependent upon rangeland resources and where there is not yet a lot of cedar, those are the areas where the spread of cedar is slowest, which gives us the best capabilities to manage spread. It also represents where there's the greatest risks because they haven't been hit with those changes yet. So there is full potential for cedar to reach those consequences long-term, whereas other places are already have some level of degradation associated with it in terms of certain consequences to other resources. So we can identify what those consequences of benefits could be to make more informed decisions across those areas. But that means that places like west central Nebraska and in areas, the Sandhills, there's a lot to lose relative to gains in associated with wind management. And we have those kind of science platforms coming out over the next year or two.

HUGHES: [00:15:38] Is there a different type of tree that would be as readily adaptable, adaptable to the environment that could replace eastern redcedar? Or is it just all evergreen in general would end up doing the same thing?

DIRAC TWIDWELL: [00:15:55] Yeah, there's definitely other people in the room that can answer that more, associated with representatives from Halsey and others. The challenge that we see as a scholar and historian of the science is that when you took so long to get cedar established and we had all those investments, and we're talking large investments since 1926 in the state of Nebraska. We've led the country with the distribution of eastern redcedar seedlings. So there's been so many decades of investments put in and it worked for wind. Now we see that it's not an inventive

species, that it's spreading. There's consequences. So the transition to something different, that's always a major lag. Usually, groups don't try those transitions until there's more major environmental consequences that become realized in the states at the early stages of this invasion process.

HUGHES: [00:16:48] Okay. Any additional questions? I apologize, did you spell your name when you started?

DIRAC TWIDWELL: [00:16:55] Yes, sir.

HUGHES: [00:16:56] Okay, thank you. Okay. Thank you for your testimony.

DIRAC TWIDWELL: [00:17:01] Thank you.

HUGHES: [00:17:02] The next testifier is Scott Smathers. Welcome, Mr. Smathers.

SCOTT SMATHERS: [00:17:18] Chairman Hughes, my name is Scott Smathers, S-c-o-t-t S-m-a-t-h-e-r-s. I'm the executive director of the Nebraska Sportsmen’s Foundation. However, today I'm here representing that Nebraska Conservation Roundtable. Excuse me. The Nebraska Conservation Roundtable consists of 24 organizations and agencies with a shared mission to improve the Nebraska conservation community through development of a more cohesive voice for conservation, create dialogue and foster collaboration, serve as a resource for policymakers, and recommend science-based sustainable solutions for complex conservation issues impacting Nebraska's natural resources, fish, and wildlife habitat. Conservation Roundtable works on common shared issues and acknowledges member organizations and agencies' independence, thus allowing each entity to determine if they will sign on to any documents or recommendations developed by the roundtable.

The Conservation Roundtable has prioritized seven key issues facing Nebraska's wildlife and natural resources, one of them being the eastern redcedar encroachment. A white paper was produced by a subcommittee with an expertise on the issue, reviewed by the full roundtable, and the signed support of 20 roundtable members which is being submitted as written testimony today. In your packets I handed out that you have our white paper and what we call our marketing sheet, if you will. Cedar, a tough and hearty native tree species, are rapidly expanding across much of the state, in part due to its adaptability to a wide range of conditions. The lack of fire on the landscape, both prescribed and wildfire, changes in farm and grazing practices, drought, lack of grassland and forest management, changes in land ownership patterns, and conservation plantings as a seed source Cedar has expanded much more than any other species across much of the Midwest and Great Plains. Many Nebraskans don't perceive redcedar encroachment as an significant threat until trees have overtaken an area and become too dangerous or expensive to remove. Now is the time for proactive cedar removal and management, while it can still be addressed. The rapid expansion of cedar trees is a current concern because of among the four major groups of birds, grassland birds have recently experienced the steepest declines. Studies show that grassland bird populations decline rapidly when cedar trees reach only 10 percent in a grassland. So if cedars spread in Nebraska's prairies and grasslands we will see continued bird declines. Cedar expansion is a problem for Nebraska livestock economy. Cedar expansion reduces livestock production by 75 percent when grasslands are overrun by cedar trees. Cedar spread is on the cusp of being beyond Nebraska's ability to control. Many landowners fail to recognize small cedars as a threat. Current land cover analysis don't necessarily capture all the grasslands and very small cedars that within 10 years will be substantially more expensive-- expansive and potentially dangerous to remove. Currently it is estimated that it costs landowners and conservation organizations roughly $15 million annually just to maintain existing grasslands. This is assuming that 25,000 acres will need to be cleared annually if the invasion in forests is included with grasslands where removal is often more costly. It would cost $23 million every year to mechanically clear 38,000 acres of cedar forest

just to stay even with the expansion that was observed from 2005 to 2010. Neighboring states have large tracts of land turned from grasslands to forest. Oklahoma is currently losing a hundred square miles annually to cedar expansion. Nebraska is in a position now to learn from other states and take action. As cedars become more dense there's an increased threat of wildfires, which is a threat to homeowners in agricultural. For example, in 2016 in Kansas the Anderson Creek fire burned 313,000 acres, killed 750 head of cattle, and destroyed at least 11 homes and 2,700 miles of fence. County officials-- county officially estimated the fire cost at least $30 million in total damage and that $1.5 million was spent on suppression efforts. In 2017 at the border of Kansas and Oklahoma the Starbuck fire burned 509,000 acres, killed one person and at least 4,000 head of cattle, and destroyed 26 homes. The official estimate caused by the fire was $50 million total damage and at least $700,000 to suppress. The Nebraska Conservation Roundtable recognizes many individual landowners, agencies, and organizations that are investing in controlling, managing, and reducing eastern redcedar. The roundtable has identified the following actions needed to combat eastern redcedar expansions to include but not limited to: expand control reduction methods, such as mechanical tree removal and prescribed burns. By using cost-share and technical assistance programs, conservation entities have demonstrated that landowners will continue to manage cedars into the future. Identified priority geographic areas for action. There may be areas in Nebraska where it's simply not feasible to reduce the cedar forest. Conducted targeted research, developed non seed-bearing cedar trees, educate Nebraskans that redcedar encroachment is a problem, and conduct extensive education and outreach activities so more landowners are aware of the proper responsibilities that will have to maintain cedar plantings that may negatively impact their neighbors. Explore development opportunities to promote economic incentives and drive for cedar removal, processing, and management. This may include, but is not limited to, finding alternative uses to remove cedar wood. All the statistics in the testimony are provided to you at the link that is provided and also the references are listed on the back page. That concludes the testimony of the Nebraska Conservation Roundtable.

HUGHES: [00:22:31] Thank you, Mr. Smathers. Are there questions? Seeing none, very good.

SCOTT SMATHERS: [00:22:36] It's too easy on a Friday, guys.

HUGHES: [00:22:40] Okay. Our next testifier is Craig Derickson. Welcome.

CRAIG DERICKSON: [00:22:55] Thank you. Good afternoon, Senator Hughes and the Natural Resources Committee. I'm Craig Derickson, C-r-a-i-g D-e-r-i-c-k-s-o-n, of the U.S. Department of Agriculture. I'm the state conservationist for the Natural Resources Conservation Service. Our agency has about 300 employees across Nebraska in 77 field offices. These field offices work directly with Nebraska's farmers and ranchers to conserve and enhance natural resources on privately-owned land. Our conservation programs are created and funded through the farm bill. They are strictly voluntary. Our staff provides one on one assistance developing conservation plans to meet each farmer-ranch operation's needs. One of those needs is the issue being discussed here today, managing eastern redcedar trees. Since the mission of the Natural Resources Conservation Service is helping people help the land, the ways we provide that help can vary from eastern Nebraska to western Nebraska and from operation to operation. Some operations want to plant cedar trees to protect for protection from wind and snow while other operations want to remove cedar trees to improve grazing land. The conservation programs the Natural Resource Conservation Service offers have the flexibility to provide assistance to both of those scenarios. The 1996 farm bill created the Environmental Quality Incentives Program, commonly referred to as EQIP. It provides financial assistance to farmers and ranchers to address a wide variety of natural resource concerns. Since 1997, more than 100,000 producers in Nebraska have received over $340 million through the EQIP program. Out of that amount, over $19 million or 5.8 percent of the total EQIP dollars spent has been used to either plant eastern redcedars, primarily in windbreaks, or to remove

eastern redcedar from grazing lands. Let's take a closer look at those two scenarios. The Natural Resources Conservation Service offers funding through EQIP to plant windbreaks on privately-owned ag operations. Eastern redcedars are used in many of the windbreaks planted in combinations with other species. Since 1997, more than $2 million dollars of EQIP funding has been used to help over 1,900 producers install 6 million feet of windbreaks. Conversely, since 1997 the Natural Resources Conservation Service has offered funding through EQIP to remove eastern redcedar trees on privately-owned ag operations. The two primary conservation practices used to control eastern redcedar are brush management and prescribed burning. Brush management provides funding to remove woody plants on all privately-owned land except crop land. The woody vegetation is removed by physically cutting it down, applying herbicide, or a combination of both depending on the site conditions. The amount of funding available to conduct brush management through EQIP varies from $15 to as high as $196 per acre. The funding level depends on the number of acres to be treated, where the area is located, whether or not it is next to a stream or in the uplands, the terrain, and the level of the infestation. For example, a site on rough terrain next to a stream with a high density of cedar trees would be much more expensive to manage than a small, level pasture with just a few cedars. Sites requiring the most difficult methods of brush management receive the highest level of funding. The funding provided through EQIP helps what is often an expensive practice for landowners. Since 1997, EQIP brush management, over $15 million was paid to more than 4,000 producers to remove eastern redcedars from more than 225,000 acres. Prescribed burns are planned, highly managed fires deliberately set by a land operator and a burn team. This controlled fire permanently kills the cedar trees, helping increase forage capacity for livestock and wildlife. Land eligible for EQIP funding includes privately-owned grasslands, wildlife land, or forest land. The amount of funding available to conduct prescribed burns through EQIP varies from $6 per acre to $16 per acre, depending upon the number of acres to be burned, how rough the terrain, and the fuel load present. The cost of conducting a prescribed burn is correlated to the level of risk associated with the burn. The higher the risk, the higher the cost. For example, a

large, steep pasture mostly covered by cedar trees would receive a higher amount of funding than a small, level pasture with just a few cedars. Since 1997, over$1.5 Million was paid to more than 600 producers to burn over 170,000 acres in addition to the EQIP funding provides landowners to carry out this practice. We also provide the planning needed to conduct a safe burn. Obviously this management practice comes with potential risk. The planning assistance given by the Natural Resources Conservation Service gives producers not only the financial feasibility but also the peace of mind to carry out this highly effective practice. The Natural Resources Conservation Service in Nebraska is concerned-- currently considering potential changes on how we provide funding to projects involving eastern redcedars. Factors under consideration include areas that are determined to be the most vulnerable to the spread of redcedar, could be considered a lower priority for EQIP funding to plant eastern redcedar, and we are also working to develop additional viable species for planting in windbreaks. The Natural Resources Conservation Service will gather feedback from a variety of partner agencies and organizations prior to making any changes to our EQIP policies. We have a strong conservation partnership in Nebraska and I look forward to further discussions report regarding this important subject. Thank you.

HUGHES: [00:30:10] Thank you, Mr. Derickson. Are there questions? Senator Kolowski.

KOLOWSKI: [00:30:14] Thank you, Mr. Chairman. My question is one of history. Would you go back a little bit and tell us about when the redcedars were introduced in Nebraska and the selection for their use? Why was that chosen and did we not foresee the possibility of what would take place in case they did spread the way they have?

CRAIG DERICKSON: [00:30:38] I will answer some of that but there's probably others here who are more of an expert in that than I am. But we know just from history records that even back to the 1880s the eastern redcedar was planted in and around homesteads probably throughout the state.

But certainly in the areas in the central and eastern part of the state. And it is a native species but I think there is just a combination of environmental and ecological factors going on that have allowed it to expand. It's almost this phenomena sort of situation that we're now seeing. So I don't know that there was enough foresight to see that that condition would exist. But, you know, as Dr. Twidwell and others have said, we're seeing the expansion and the invasion at just such a rapid pace that it really stands out to landowners as well as to agency officials. Was there another one?

KOLOWSKI: [00:31:39] No, I just wanted to comment that in my own travels back and forth between Lincoln and Omaha for all these years, within decades I saw the entire valley by the river become just filled with those trees. And it looked like there was no stopping them or no plan to do something about them. And now we're at this point of challenge: what we're going to do and how are we going to do it and how much is it going to cost because of the lack of foresight of maybe this should have been control. Severely controlled and at a different time and different place and a different situation. If that makes sense.

CRAIG DERICKSON: [00:32:30] It does. And I think that's one of the positive things about the discussions we're having now is what do we do with what we have and where it looks like we're headed.

KOLOWSKI: [00:32:38] Thank you.

HUGHES: [00:32:40] Additional questions? Senator Bostelman.

BOSTELMAN: [00:32:44] Thank you, Mr. Chairman. Mr. Derickson. I have several questions, here, you may or may not know. But those who testify after may have answers fort them. I'll get them out now and then we will kind of roll through them. You mentioned in your testimony here

this that redcedars are blended in combination with other species. And I think that goes back to what Senator Hughes and asked earlier about what other species are there available and a growth rate on those that could be replacing redcedar, eastern redcedar specifically. And follow up with that one is why do we continue to, if we have others, these other trees we can put on, why do we continue to allow funding for and distribute eastern redcedars? That would be the start of my questions.

CRAIG DERICKSON: [00:33:38] Okay, in terms of other species, you know, some of the first that would come to mind would be pine trees and other combinations of both shrubs and hardwoods like oaks and hackberry. Possibly a locust in some areas where that doesn't turn out to be invasive. But one of the desirable characteristics about the eastern redcedar is the very dense growth that it provides. And so there's no readily available exact replacement for those characteristics. A lot of persons would very quickly jump to presuming maybe that juniper could have those same characteristics but there's similar concerns, especially to the south of us, regarding Juniper. So I think there's reservations on going to that options. But I think from a windbreak design perspective we can try to duplicate the density and the protection that eastern redcedar provides with a combination of other species. The second part of your question, why continue to plant them? You know, the state is very diverse from east to west, not only in the amount of rainfall that we receive but in the land use and just the things that affect agricultural operations. So we have a lot of ranchers, particularly in the western part of the state who very much desire eastern redcedar for livestock protection for calving and another uses. And so we need to make a big transition in order to have a suitable alternative for them to get the kind of protection that they need out of those windbreaks. And so we're working with a number of the partners that you see in the audience to figure out how to make that transition because it will be a change from the history that we have.

BOSTELMAN: [00:35:30] The other question I have is a curiosity question. You may or may not

know the answer to this, which I can understand, but maybe someone else will is is there a difference-- have we seen a difference in resident landowners versus absentee landowners and those who control and those who do not control. In other words, if we have a large-- our absentee landowners is as concerned or aggressive with control with controlling invasive species as a resident landowner. If I've got-- if I'm a cattle rancher and I, you know, on my property I may take care of it a lot different than a person who's out of sight, out of mind.

CRAIG DERICKSON: [00:36:11] Well, I'll comment on that. But I don't have any specific data on absentee landowner control of the eastern redcedar but I would say anecdotally I think what you said is accurate. You know, persons who are away from the land and aren't the ones that are actually managing or working with it are less inclined to install permanent conservation practices or make these kinds of investments. And we see that as being true across the wide range of the conservation activities that we provide services for. But I'm always reserved to make generalizations that, you know, that applies to everyone because it certainly does not. But I think your point is well made that with, you know, a large portion of Nebraska's land being rented land that it presents an additional challenge where to find incentives for the person that owns and operates that land to make the investments that are going to be needed to control eastern redcedar.

BOSTELMAN: [00:37:10] Thank you very much.

HUGHES: [00:37:11] Additional questions? Seeing none, thank you, Mr. Derickson. Appreciate you coming today. Next up is Tim McCoy, Nebraska Game and Parks. Welcome, Mr. McCoy.

TIM McCOY: [00:37:31] Good afternoon, Chairman Hughes and members of the committee. My name is Tim McCoy, T-i-m M-c-C-o-y. I am the deputy director at the Nebraska Game and Parks Commission, 2200 North 33rd Street; Lincoln, Nebraska. Appreciate the opportunity to share some

information about the impacts of redcedar on wildlife. The increases in eastern redcedar invading both grasslands and woodlands are having some negative effects on many of our Nebraska wildlife. I'm going to start and talk more from the grasslands side and then I'll get into some of the woodland stuff. In places where we do have intact grasslands and prairies, they are often being encroached with eastern redcedar, making a fewer quality acres available for species. And some of those are species that are important to us and especially important to landowners, like pheasants, prairie chickens, and other grassland species. What we've saw in research for grassland-dependent species such as greater prairie chickens, we've saw that lek sites, which is where they sort of get together and the males call and dance and try to attract females in the spring for breeding, they will they will either avoid areas with cedar or they will abandon existing sites as cedars encroach on the grassland. We also have documented in studies they avoid nesting near trees. So it really has a significant impact in terms of reproductive habitat, that you eventually lose those species moving out of those areas. We've found some interesting information in about the last five years looking at habitat suitability for pheasants across the state. We've found a clear connection between higher numbers of pheasants and areas of the states that have fewer wooded acres. So there is-- there are some other impacts there and I'll get to some more of those later. I'm starting with a lot of the statistics, hopefully that's okay with you guys. Overall, we see grassland bird abundance and diversity decline when eastern redcedar exceeds 10 percent in grasslands. So those impacts come pretty quickly. Work we've done in the Loess Canyons, which you heard mentioned earlier, an area of the state where we've had a long-running effort with a lot of conservation partners targeting redcedar. The federally endangered American burying beetle is in that location. The work we've done has identified that those beetles are much less likely to be found in areas where we have cedar-dominated grasslands. And the number of beetles that we were able to trap when we look at individual trap sites are much higher, about twice as high, when you are in an open grassland situation, which is really where they prefer to be. The other thing that we see is a small mammal species declines as cedar encroaches into grasslands. About-- what seems to be a tipping point, 25

to 30 percent eastern redcedar encroachment, you lose many of the native small mammals and you end up with in some states you end up with a severe reduction in the number of species and number of them. And in some of the southern states they've identified there really appears to be one species, the white-footed mouse, that really prefers that habitat. In our woodland riparian areas that are threatened by cedar there's a-- there are several impacts. We see a loss of natural regeneration when we look at oak hickory forests and also even in our cottonwood gallery forests. When you have an understory of eastern redcedar, we don't see the recruitment of new trees into those riparian forests and many of our oak woodlands that are in the bluffs. And that has some pretty important impacts. We see from a bird standpoint species richness changes dramatically when you don't-- when you have eastern redcedar. And part of that is once you get eastern redcedar under a forest, as those trees grow together and grow up they create a closed canopy. And really nothing grows under eastern redcedar trees. Once they reach that point, you're dealing with a bed of needles and needles and pretty much bare ground. So it does provide some cover for wildlife but the food resources that are there in terms of wildlife that are foraging through there get, you know, they get very minimal. They also create that ladder fuel in those forests. Most of our forests in Nebraska were historically fire adapted. So a lot of our trees can handle fire going through those areas. Normally, it's at a much cooler temperature. Many of those fires would have been, you know, early fall or very late fall or early spring historically. When you get eastern redcedar go in there and you have a fire, right now it's typically a wildfire where that would happen, you lose your big trees too. It's pretty devastating. When we look at those combined impacts, Nebraska we have what we call our Nebraska Natural Legacy Project. It's a statewide action plan targeted at conserving at-risk wildlife and keeping our common species common. Eastern redcedar invasions identified in a threat as 27 of the 40 identified biologically unique landscapes that we've identified are really important for biodiversity and in a wide range of wildlife. And that includes nearly all of the grassland and woody communities that we've looked at in our plan. We've spent millions of dollars over the last 15 years in trying to control cedar trees on our own lands and also with private lands in those priority habitat areas

within those wells across the state. And we've partnered with many, with NRCS, with Landowners, with some of the other landowner groups you've heard from today. And, you know, we see on a local scale we can have an impact but scaling that up regionally is difficult. The other thing that we know when you remove eastern redcedar is follow up is critical. You can do mechanical removal but you need to be prepared for the growth that will follow. From a larger standpoint, one of the things I'll try to hit quickly because I see my light is turning yellow. There are some secondary impacts we see as we see eastern redcedar impact areas, or as we've planted them. And I will say as an agency, historically we planted a lot of cedar trees. We've stopped planting them 15 years ago and are undertaking a lot of efforts to move those out. We get a lot of questions about that, it's like that's wildlife habitat for my deer, why are you taking out of there? Well, we see broad impacts on grasslands and grassland species. Several of those species I talked about earlier, they won't nest in these smaller patches that are remaining grassland. You lose reproduction of those species. That's devastating. That's what maintains our wildlife populations. And I tell people we get one chance a year to have more pheasants and quail. Survival through the winter is important but we have one chance, and that's a really important chance for us. Those trees create other issues. They're great travel corridors for things like nest predators like raccoons and possums and skunks and foxes and coyotes, will move through those. And then they can easily find animals that are in those patches. So that's one of those reasons that we really think it's an important issue to deal with from a wildlife standpoint. And I see my light is red, so I'll stop.

HUGHES: [00:45:04] Thank you, Mr. McCoy. Are there questions? Seeing none, very good. Appreciate you coming. Next up is Adam Smith, Nebraska Forest Service. Welcome, Mr. Smith.

ADAM SMITH: [00:45:22] Thank you very much. Good afternoon, Senators, members of the Natural Resources Committee and Chairman Hughes. My name is Adam Smith, A-d-a-m S-m-i-t-h, and I am the forest products program leader with the Nebraska Forest Service. And I'm testifying on

my own accord and not on behalf of the University of Nebraska. Eastern redcedar is a native tree historically confined to the deep ravines and north-facing slopes that are protected from fire. The lack of natural fire has allowed redcedar in some areas to mature, creating a scenario in which the use of fire for control can be unsafe due to the potential increase fire intensity, increased risks to prescribed fire practitioners, and negative air quality impacts. However, the use of prescribed fire as a proactive management tool is still a cost-effective and efficient option for managing the encroachment of small cedars. Once trees mature, the best option for management shifts towards mechanical management. Specifically, redcedar removal via chainsaw, skid steer equipment, and larger machinery. While mechanical management is expensive-- is effective, it is expensive and routine prescribed fire is still needed to maintain the area as a grassland. After management, landowners are often left with large brush piles which are disposed of by burning. However, the burning of redcedar piles or large dense stands of trees results in wasted economic opportunities and increases the environmental impacts of management. According to a survey completed by the Nebraska Forest Service and U.S. Forest Service in 2014, the Nebraska wood products manufacturing facilities such as sawmills used redcedar wood to produce 870,000 board feet of saw log products such as lumber and paneling, enough animal bedding to cover, Tom Osborne Field at Memorial Stadium with four feet of material, and enough fencepost to install a fence spanning from South Dakota to Kansas. Additionally, the Nebraska College of Technical Agriculture uses approximately 750 tons of redcedar woodchips each year to heat 200,000 square feet of building space. The manufacture of these products supports rural economies and provides jobs. Aside from traditional wood products, the Nebraska Forest Service has worked with partners to identify new strategies to utilize redcedar wood and decrease its waste. We have partnered with the Middle Niobrara Natural Resource District and the Department of Biological Systems Engineering at UNL to investigate using redcedar woodchips combined with livestock manure, both critical waste-management issues, as a soil amendment in the north central-- in north central Nebraska's sandy soils to improve soil health and soil moisture retention. During the project we have demonstrated

that woodchips combined with manure can decrease soil temperatures by two degrees Fahrenheit and increase soil water by 30 to 40 percent in the top 12 inches of soil, equivalent to an extra half-inch of rain. Researchers recently received a grant to expand this project statewide. More often than not, redcedar management residue is piled and burned. However, the environmental impacts of pile burning can be significant. Using the on-line pile burn-- pile fuels biomass and emissions calculator available from the University of Washington I was able to model the emissions from burning various sized piles of residues. For instance, a redcedar burn pile measuring 10 feet tall and 20 feet in diameter would emit 100 pounds of particulate matter less than 2 micrometers, 2.5 micrometers, which is small enough to inhale and cause health problems. Additionally, it would emit 10 tons of carbon dioxide, the equivalent to the annual emissions of two-passenger vehicles. To put this into more context, if we were to burn all of the saw logs which were used to make wood products in 2014, that burn when emit 19 tons of harmful particulate matter and 4,600 tons of carbon dioxide, equal to the annual emissions of 920 passenger vehicles. Utilization of these saw logs by Nebraska businesses has restored-- has stored these would-be emissions within the wood products themselves, reducing the environmental impacts of management while increasing forest health, restoring grazing capacity, and improving overall ecosystem health. With approximately 330,000 acres of redcedar forest in Nebraska, managing redcedar will be and is a daunting and expensive task. Fortunately, these forests are home to a relatively untapped resource of $18.1 million in potential saw log value, $18.5 million of potential fencepost value, along with 570,000 tons of limbs and tops suitable for biomass products. We will need all the tools in the tool box in order to effectively reduce redcedar impacts on the landscape and the utilization of redcedar wood and management waste provide economic opportunities for landowners in rural communities, fosters entrepreneurism, reduces the environmental impacts of redcedar management, and supports the state's forest products industry, all while addressing a key natural resource issue in Nebraska. Thank you for your time. I'd be happy answer any questions.

HUGHES: [00:50:12] Thank you, Mr. Smith. Are there questions? Senator Bostelman.

BOSTELMAN: [00:50:16] Thank you, Senator Hughes, Mr. Chairman. Mr. Smith, I had the opportunity for several years to work with Dr. Scott Josiah at the state forester. Specifically, we talked about this issue quite a bit. I think the challenge we have, although I don't disagree with a lot of things you say, I think the challenge that we have, especially with products I've seen over and over the years, is marketability. I mean, we can make really nice products, beautiful products, but the market just isn't there and it's hard to ship where it's located at. So part of, I guess, what I-- part of, I guess, my comment is on this is these are good. I guess, are there new areas that the Forest Service is working with, microenterprises, small businesses that are out there that are trying to do different types of wood products to make them more profitable? Because I know several that have tried and have failed because there's just market is not there. Like I said, there's a gentleman in my district who actually has tried, lived out in Chadron and tried to do work with logging redcedar and creating products and then it just doesn't work because of marketability of that. What type of things, if any, can or is the Forest Service willing to help those individuals become maybe more profitable, make this more realistic? It's a small part of a very huge product-- problem. But each piece put together, maybe we come to a solution at some point. So if you have any comment to that as to what the Forest Service is doing to help small businesses in this area.

ADAM SMITH: [00:51:47] Yes. Thank you for that, for that question. A couple of the barriers that we see on the supply side relate to general small business issues that natural resource businesses tend to have. Specifically, with vehicle weight limits, the ability to transport the material longer distances compared to other states in the area, higher insurance costs. And so some of these businesses struggle to get off the ground just because of the operational costs that they're running into and it scares them away from doing that. The Nebraska Forest Service offers programs to assist with product development so we have worked with producers out of Chadron to look at a project or

product called bio char, which is a wood-based charcoal solution. We have worked with Nebraska Public Power District to look at investigating coal firing redcedar woodchips and other wood with coal. We've also worked with a company who is trying to put up a facility in northeast Nebraska to produce torrefied wood pellets. Everything from a large 350,000 ton potential markets down to the person who wants to create a niche product such as wood vinegar or some innovative product. Just last week I received a phone call requesting 10,000 tons from a business in Hershey looking for wood products. And so these demands are out there. There are barriers on both the supply side and the demand side I would agree to really seeing this have, sort of take the lead as far as really impacting the landscape. But it is an option that we.

BOSTELMAN: [00:53:08] Thank you very much.

HUGHES: [00:53:09] Senator Kolowski.

KOLOWSKI: [00:53:13] Thank you, Mr. Chairman. Mr. Smith, thank you for your comments today and you're giving us another side in all these things that this is a consumable item that can be used and there could be profit from this and all the rest that goes with it. But what are some of the states that are ahead of us. They have the issue, it's happened, they're dealing with it. And what are-- what are some states we could look at and say they've got their total life together? It's not just going out and burning the trees down. But there is consumable uses of these redcedars that we could chop up and do different things with. And what model states are there? Give us two or three that would be something we would look at and say there's something there that we could do.

ADAM SMITH: [00:54:06] As has been mentioned in the past, this has been an issue in the Great Plains for decades going into the south. Redcedar as a species is similar to western juniper that you'll see states like Oregon and Utah. They have both seen an increase in utilization. Utah has a

company that is using redcedar material to produce cedar oil for as an essential oil for a market and that uses 12,000 tons a year of redcedar material. Another state, Oregon, has made a state push through some nonprofit groups that have really taken hold to replace common products that people use in the state with western juniper, such as landscape timbers, and really promoting fence posts, and replacing pressure-treated lumber and fences with western juniper products. And so some states have had the opportunity to find something that really grabs ahold and makes an impact, while others have tried things like very large OSB plywood plants that never really take off or large economic-- or economic development efforts to do landscape level specialty products that don't really seem to make an impact and haven't been successful. And so there are opportunities out there for us to learn from states maybe outside of the Great Plains that have taken benefit of this.

KOLOWSKI: [00:55:18] Models that can help us.

ADAM SMITH: [00:55:19] Absolutely.

KOLOWSKI: [00:55:20] Thank you very much.

ADAM SMITH: [00:55:21] Thank you.

HUGHES: [00:55:22] Additional questions? Senator Quick.

QUICK: [00:55:25] Mine is more of a comment but I know not far-- my dad lives around Hordville and there's a cedar products, they have a saw mill. And I know they've been really successful. I mean, and actually they had to quit taking cedar because they were so-- so they just had nowhere else to go with it. But they are taking it again. But there are businesses out there who have been successful too, right? I mean, they've been able to market the products that they're put out? And if

you want to comment on that.

ADAM SMITH: [00:55:53] Absolutely. We have redcedar products that make their way to China that are sent for export. We have a commercial shavings mill in Clarks that's been around for years. And what's interesting about the forest products industry in Nebraska is once one of those pieces goes down, because it is such a small group. Such as the fire, the shavings mill in Clarks. That whole central Nebraska area shut down. So everyone sits on their logs and then they struggle to get them to market. And so we know the impact that an individual business can have on the region. Developing more of those businesses can continue that so when one system or one facility shuts off, you still have some redundancies in there. The supply is not going to be an issue. It tends to be market site demand, which we can help with.

QUICK: [00:56:34] Okay, thank you.

HUGHES: [00:56:37] Additional questions? I just have one. Is there any research that you know of going on to breed a sterile eastern redcedar? Is that-- would that even be possible, that we could still have the benefits of the tree for windbreak but yet not have to have the concern of the spread?

ADAM SMITH: [00:56:57] There has been work done in Kansas to look at cloning redcedar. So the male-only species with limited, limited success. I think the issue that some people have considered this in this in Nebraska is the up-front costs associated with getting all that material ready for the germ plasm and the materials that you need to do large-scale production of sterile plants.

HUGHES: [00:57:21] How-- just background. How large does the tree have to be before you can determine if it's male or female?

ADAM SMITH: [00:57:28] Trees typically reach maturity between seven to ten years.

HUGHES: [00:57:31] So we're talking maybe 15 feet?

ADAM SMITH: [00:57:35] Probably. In the ballpark, 10 feet, yeah.

HUGHES: [00:57:37] Okay, thank you. Any other questions? Seeing none, thank you. We appreciate you coming today, Mr. Smith. Next up, Sue Kirkpatrick Prescribed Burn [SIC] Council.

SUE KIRKPATRICK: [00:58:03] Good afternoon, Senators. My name is Sue Kirkpatrick, S-u-e K-i-r-k-p-a-t-r-i-c-k, and I am here representing the Nebraska Prescribed Fire Council as a private landowner and a board member. The Nebraska Prescribed Fire Council is a coalition of landowners and prescribed fire practitioners with over 750 members across the state and growing. The council aims to promote the safe and responsible use of prescribed fire and act as an advocate for those who currently use or want to use prescribed fire to manage their land. These objectives are realized through a series of partnerships and programs designed to help educate the public on the importance of fire, the implementation of adequate private land workshops and training, and through the practice of using safe prescribed fire techniques. We are here today to bring to your attention the need for an increase in the use of prescribed fire to combat the threat of the spread of eastern redcedar trees across our great state. Our membership has many reasons why they use fire on their land, from increasing forage to conserving wildlife. But the one that virtually every member uses it for is to control invasive woody species, especially cedar. Our members recognize the threat of cedar and also recognize the easiest and most cost-effective method of control: fire. The cedar tree is a fire-sensitive species easily controlled through the use of fire, especially when it's small. It is in fact so fire sensitive that the plant was considered rare prior to pioneer settlement. The reason the

cedar tree was rare was because for thousands of years periodic fires had swept across every corner of our state, transforming it into one of the most iconic and beloved landscapes in the world: The Great Plains if you travel across our state in the months of March and April you may have realized in recent years that there seemed to be more and more smoke plumes dotting the landscape. These prescribed fires, conducted by many of our members, are becoming more and more frequent. Over the past few decades we have seen a significant increase in the use of prescribed fire. However, even with the increase between state and federal agencies, private landowner groups also known as prescribed burn associations, contractors, NRDs, and others using prescribed fire we average fewer than 50,000 acres a year in Nebraska. According to historical fire cycles, this represents only a fraction of what we should be burning on an annual basis in order to maintain our prairies, wetlands, and forests. Prescribed fire is such an incredible tool. The question might be posed, why aren't we using it more? There are many reasons as to why the use of fire is not more widespread. There are policy barriers that limit cedar control through prescribed burning. Future policy changes could further restrict landowner ability to manage their rangelands. And we feel that landowners should be a part of the decision-making process. Landowners who, by the way, have a proven high safety record comparable to any state or federal agency. The Nebraska Prescribed Fire Council is looking forward to working with the Natural Resources Committee, state senators, and state and local stakeholders in the future to identify and overcome the challenges and barriers to getting more fire on the ground. Senators, the time is now to be putting more fire on the landscape. The time is now for more landowners to act. The time is now for local, state, and federal agencies to act before it's too late. Our organization does not want to be here in another 25 to 50 years in front of another panel of senators being asked questions as to why we weren't burning more and why the barriers were not broken down before it was too late. Let us begin now, today moving forward together because this is a problem for all Nebraskans. Will we be able to tell our children, grandchildren, and future Nebraskans what we did to save the last parcels of prairie from being swallowed up by the eastern redcedar or will we have to tell them that we failed to take this opportunity to support and

increase the use of prescribed fire? What will our legacy be? I come before you today as a citizen and board member of the Nebraska Prescribed Fire Council and ask for your help to ensure the future of Nebraska's landscape. Thank you.

HUGHES: [01:02:14] Thank you. Questions? Senator Bostelman?

BOSTELMAN: [01:02:18] Mr. Chairman. Thank you for your testimony. Appreciate it. I do prescribed burns on our place so I know exactly what you're talking about. And not only does it take care of our woody plants and our cedars but also rejuvenates the growth we get back out of the landscape is phenomenal. One question, I guess, part of the question I have, is more of a solution question. What solutions do you have for this body to look at? In other words, where I'm at, I'm responsible for my burn, I'm responsible for the-- for the plan, for the protection, for the execution, for all that. In other areas maybe there's a group like yours that comes together and shares in that responsibility where there's not something similar across the state. Do you have some solutions that you've thought of to introduce statewide that would help us to get have more people burn on our lands, make it easier. Because if I go to my local volunteer fire department, they won't touch it. Other places here, they will. So do you have some suggestions?

SUE KIRKPATRICK: [01:03:21] Well, that's a very good question and I appreciate that. The thing I would like to do is see more landowners or see landowners in general be attentive to their land and not let the cedar tree creep up on them. And if they are watching that happening, getting involved in prescribed burning and getting in touch with the prescribed fire associations that are intact right now. Further solutions would be up to policymakers and the agencies and the landowners to work together and really, you know, investigate the possibilities what we can do in the future. And this is kind of new to me how these things happen. So that would be up to Natural Resources Committee, policymakers, landowners, everybody to work together and communicate

and try to get more people involved.

BOSTELMAN: [01:04:14] Do you think it's an education? Do you think it's a training? Do you think it's a financial solution?

SUE KIRKPATRICK: [01:04:20] Yes. Yes.

BOSTELMAN: [01:04:26] Thank you very much for coming. I appreciate your testimony.

HUGHES: [01:04:29] Okay. Senator Walz.

WALZ: Can you speak a little bit about environmental impacts on the fire, fire burning? For example, the amount of carbon dioxide just from your point of view?

SUE KIRKPATRICK: [01:04:42] That is not data that I have in my in my box right here right now. And I would defer that question to somebody, you know, in the natural, you know, natural resources agencies that they have those right up here. So that's not my-- I can't speak to that right now.

HUGHES: [01:05:01] Additional questions? I've got just a couple. What resources are available to Prescribed Fire Council? Where do you get funds to operate from? Does it just come from members and landowners or are there governmental agencies, taxing authorities that give you help?

SUE KIRKPATRICK: [01:05:20] Well, we have membership-- nominal membership dues and the rest of that question I'd have to turn over to our treasure.

HUGHES: [01:05:28] OK. Thank you very much. Any other questions? Thank you. We appreciate you coming today. Shelly Kelly, Sandhills Task Force. Welcome.

SHELLY KELLY: [01:05:54] Hello. Thank you very much. Hello, senators in the Natural Resources Committee. My name is Shelly Kelly, that's S-h-e-l-l-y K-e-l-l-y, and I'm the program director for the Sandhills Task Force. My goal today is to share with you how eastern redcedars impact private landowners. The Sandhills Task Force was formed 25 years ago with the goal of enhancing the Sandhills' wetland grassland ecosystem in a way that sustains profitable private ranching, wildlife and vegetative diversity, and the associated water supplies. We have accomplished that through partnering with Sandhills ranchers and conservation organizations and agencies to implement practices and management plans that address resource concerns, which include eastern redcedar invasion and many other issues. We also host meetings tours and trainings to help educate ranchers and the general public about the Sandhills, about resource concerns, successful ranching practices, wildlife and birds, and range management. In recent years, the majority of our projects have shifted to address cedar invasion and the main topic of our outreach efforts are also around controlling cedars. The Sandhills of Nebraska comprise one of the largest contiguous tracts of rangelands remaining in the United States. We believe that eastern redcedar invasion is a major threat to the Sandhills ecosystem and rangelands throughout Nebraska. Rangelands cover approximately 50 percent of Nebraska as a whole and cedars are invading these rangelands at an alarming rate. Ranchers and landowners depend on grazing forage as their main source of income on those acres and it requires careful management to create a profit. When cedars invade pasture land they displace all other species in their canopy because nothing can grow under them and cattle do not graze cedar trees. So the invasion has a direct negative impact on available forage. Once cedars invade and nothing is done to control the invasion ranchers can either decrease the number of cattle or shorten the time that they have them in a pasture, or they can keep stocking rates the same as they were before and the invasion-- before the invasion, which leads to

overgrazing. Overgrazing allows the rancher to maintain their income for a couple of years but it mines the rangeland resource, which in the long-run will reduce the total forage production for many years, reduce the wildlife habitat, increase erosion from wind and water, and reduce the ability for the land to withstand drought. My husband and I are ranchers, and I've had the opportunity to work with many other ranchers all across the Sandhills, so I'm comfortable that to help them deal with their cedar invasion as well as their grazing management. So I'm comfortable putting numbers to the cedar invasion impact on ranchers. Sandhills rangeland that produces about 1,800 pounds of forage annually has been receiving a grazing lease of about $30 an acre. The property taxes are around $6 an acre in Lincoln County for upland pasture and the remaining money is used to pay the mortgage with a little left over to cover labor costs, overhead, and a small profit. If cedars have a 10 percent canopy and the rancher reduces their stocking rate appropriately the income would be reduced by $3 to $5 per acre, which in most situations makes it so you cannot make any money grazing cattle. What's more disturbing is the cedars will not remain at the 10 percent canopy level. Left untreated, they will exponentially increase their coverage and we've seen that take place. Cedar invasion reduces income for ranches but it also causes problems with accessing the property, checking cattle for illness, gathering and moving cattle, erosion, lack of plant diversity, and impaired wildlife and bird habitat. Ranchers have relied on established cedar windbreaks to protect livestock for decades and those cedars, when they're in the right spot, they provide excellent protection. The need for livestock production has not gone away but we need to be mindful of what options exist. There are alternatives to cedar windbreaks and conservationists across the state need to be well versed in what they are. If a rancher decides to plant cedars, it would be my sincere hope that they clearly understand that windbreak will require maintenance in the future. Thank you for taking time to learn about how cedars are impacting Nebraskans. The Sandhills Task Force is actively waging war against their invasion and we're very willing to help you ensure that property rights are not negatively impacted by policy that may be proposed in the future. Thank you.

HUGHES: [01:10:49] Thank you. Questions for Ms. Kelly?

BOSTELMAN: [01:10:53] Yes.

HUGHES: [01:10:55] Senator Bostelman.

BOSTELMAN: [01:10:55] Thank You, Mr. Chairman. Thank you for coming in today. I want to ask you a question I asked before. Maybe you have a better answer or have something that you can speak specifically to it. What percentage-- or do you see a problem or a difference in those who are absentee landowners versus resident landowners and how does that affect the control of redcedar in those parcels of ground?

SHELLY KELLY: [01:11:18] Sure. And that's a great question and one that I hear a lot, too, because people want to know about their neighbors. So that's a wonderful one. I have seen absentee landowners that do better than their resident landowners, their resident neighbors. I've also seen it worse. So I've seen both sides, and I have not seen a trend one way or the other to say that absentees are worse or better at it. Sometimes absentee landowners have more available funds to be able to put into controlling cedars than somebody that's making their sole income based upon that landscape. And, you know, when we cost share on projects they'll kick in more funds than somebody might be-- somebody else might be able to afford. Other times, they're just completely not engaged. So we see the whole spectrum.

BOSTELMAN: [01:12:14] So would you happen-- I appreciate that. Would you happen to have-- is it a financial, is it education? You know, come back to the question I asked before, what is it really a part of that solution. I know there's a little bit of both, but I mean in your area if you go help

other ranchers with a prescribed burn, what are the things that make it attractive or make it useful for those individuals to start using that tool that aren't using it today?

SHELLY KELLY: [01:12:42] Absolutely. And that's a great question. I think-- I think we're really struggling education-wise. The outreach is huge. We still have a lot of landowners and a lot of citizens of Nebraska that do not understand that cedar trees are a problem. There's a lot of people that I hear talk about how beautiful the cedars are; and if only those hills south of North Platte could be completely covered by cedars we would have like mountains in the Rockies and we wouldn't have to go so far. So there is an education gap that we really need to address. And people are working hard on it but we need to do more. On the financial standpoint, it is going to take a lot of dollars to be able to have these landowners control the invasion that's occurred on their place and be able to maintain ranching. And so there is some financial need as well. And I'm going to go back to education a little bit again because prescribed burning is something that's been a challenge in the Sandhills because there is a long-held belief that fires are bad. There's been campaigns, you know, talking about how destructive fires are and it really took hold. People really understand that. But so it's hard to get past thinking that fires are bad to thinking that fires can be beneficial and helpful. And that's the paradigm shift that we're facing and we're working on. And we're gaining traction but we have a long ways to go. And so education becomes something big there. But technical ability is a problem too because some people aren't trained. The Nebraska Prescribed Fire Council does a great job, as well as other organizations, on putting on trainings. We do some hands-on prescribed burn trainings in the Sandhills which helps. And so people knowing about those trainings and going to them I think will help us in the future too. So I think, just like Sue said, all of them, you know, are issues but each of them have different ways we can work on them.

BOSTELMAN: [01:14:54] Thank you. Other questions? Seeing none, thank you very much for coming in today.

SHELLY KELLY: [01:15:00] Thank you very much.

BOSTELMAN: [01:15:01] Next is Kelly Sudbeck from Educational Lands and Funds. Welcome.

KELLY SUDBECK: [01:15:14] Good afternoon. Thank you. My name is Kelly Sudbeck, K-e-l-l-y S-u-d-b-e-c-k. I'm the CEO of the Nebraska Board of Educational Lands and Funds. The Board of Ed Lands and Funds presently owns approximately 1.3 million acres across the state of Nebraska. Of that, approximately 965,000 acres of that is grassland. My agency has been battling cedars since the mid-1980s and we continue to do so at significant cost. I thought I would give you some sense of what we're doing on the ground trying and what our concerns are as far as being Nebraska's largest landlord and landowner. Our primary concern when it comes to burning cedars is liability. We are essentially relegated to three options when trying to battle cedar trees. One is mechanical removal, another is to burn with all of our neighbors, and another is to burn on our own but only with licensed contractors that have liability insurance. One of the issues with burning with our neighbors is to try to convince those neighbors that this is something they need to do. We encourage our lessees to become members of burn associations and to rally their neighbors to the cause. But some people just don't like fire. We also, my agency in particular, has an issue that most neighborhoods when they burn require that to include your property you need to have someone on the ground to assist with the burn. We can't force our tenants to do so and we're not allowed to allow our employees to put themselves in that situation. So that's another concern that we have trying to battle cedars. As far as mechanical removal and contractors, this is an extremely expensive option and is cost-prohibitive on most of our land. We have cooperated with many of the local burn associations and have encouraged our lessees to do so also. We thought something this committee could consider would be to promote the formation of local burn associations, perhaps with a framework or some suggestion of how those could be structured so that we promote those in other

areas of the state in Nebraska. Also perhaps through funding for the local burn associations. We would also like to see more cooperation between the local fire districts and the burn associations. The burn associations we know are in great need of qualified, trained people. They also have, as Senator Bostelman had mentioned earlier, issues with local fire departments not cooperating because of their insurance coverage. That their insurance will not cover any loss as a result of the fire department being out there assisting with the prescribed burns. One local burn association we are very familiar with is the Loess Canyons Rangeland Alliance. They are doing, as far as we can tell, an excellent job and we believe that they would be a fantastic resource for this committee in determining what you can do. We know the specific situation where the local fire department requested assistance from the LRCA to control a rangeland fire and that was very effective. Other issues we have with burning is of course environmental issues. You have a very small window in which to obtain an effective fire. Even humidity can affect that, temperature, time of year. One other issue we've run into that you may not be aware of is the Migratory Bird Treaty Act. That also restricts our ability to, as far as timeline, as far as burning our properties. We thought some solutions that would be helpful, again, encourage local burn associations and fire districts to cooperate. Perhaps provide for the formation of a quasi-governmental agency similar to local irrigation districts out in the western part of the state. Those irrigation districts were formed by local landowners that were benefited by a certain irrigation ditch and they can assess property for the cost of maintaining that irrigation ditch. So everyone benefited by that ditch then pays a cost to help maintain it. That could be an option perhaps establishing districts where all the landowners pitch in and everyone takes care of their property. Perhaps, if a certain percentage of neighbors have agreed to burn their properties, perhaps that then requires other neighbors who are not willing to burn their property to be required to burn their property. Finally, perhaps we have a let-burn policy. For instance, when a rangeland starts on fire. Of course the duty of the local fire department is to rush out and put that fire out. Perhaps we allow landowners to opt out of that and say let my property burn until it has burned a sufficient amount of the property to alleviate some of the cedar tree

problem. And finally, we would like to see perhaps the local fire department personnel receive training regarding prescribed burning. Not only for their response to range fires but also then have an understanding of why those could be potentially beneficial. My agency has in the last year spent $426,000 on trying to remove cedar trees from our properties. And just this last Wednesday I was in Brady, Nebraska, we have a property south of Brady that we had to sell because we could not lease it as a result of the spread of eastern cedar on that patch. Thank you.

BOSTELMAN: [01:21:47] Thank you very much for your testimony. Are there any questions from the committee? Seeing none, thank you very much for coming in for testimony.

KELLY SUDBECK: [01:21:57] Thank you.

BOSTELMAN: [01:21:58] Appreciate it. The next will be Kent Miller from the Twin Platte NRD. Is Mr. Miller here? Kent Miller? Welcome, Mr. Edson.

DEAN EDSON: [01:22:27] Yeah, thank you. Thank you, Senator Hughes and members of the committee. My name is Dean Edson, D-e-a-n E-d-s-o-n. I'm executive director of the Nebraska Association of Resources Districts have presenting comments on LR397. Apologize for the little mix-up on the sequence order. We had a meeting before this, before this hearing, and I drew the short straw and was told that I was coming up to summarize what you're going to hear from all of the districts come up behind me. Again, thank you for the time to learn more about this issue. The summary of the policies in eastern redcedar from the 23 districts, again, following me you'll hear from all these individuals on their specific policies and unique management approaches they have. Each NRD sets policy that works for that local area. These are areas of the state where it's a problem and there are other areas of the state where this is not a problem. The focus is on proper management. Education and resource materials are provided to landowners through various venues.

Some districts hire foresters and or work directly with the regional Nebraska Forest Service to provide educational materials and management practices. I'd like to echo what senator-- what Adam Smith mentioned about working with the Forest Service in the Middle Niobrara district to provide some other management options up there and also provide some economic opportunities for individuals. That's one thing we really like to stress throughout all 23 districts. These policies for cost-sharing for planning cedar, there would be some with cost-sharing some without cost-sharing. Where cedars have become a problem or is a management issue, there is no more cost-sharing available for cedars. In areas where it's not a problem, some districts still allow the cost-sharing. Some districts are going to provide cost-sharing for removal, either manual or through prescribed burn. Other districts won't because they feel it's the landowner's responsibility to manage their property. All of this just depends upon the needs and desires of the local landowners that work with the NRD, what their policies are. I want to stress the most important part of the management is the duty of the landowner to be actively involved in the management. Local NRD can do that for them, for that landowner. In closing, I would just ask the committee to continue to allow the NRDs to provide management options to landowners whether that be cost-share for planning or removal. So end of my testimony and I would be glad to take any questions.

HUGHES: [01:25:18] Okay. Thank you, Mr. Edson. Are there questions? Senator Kolowski.

KOLOWSKI: [01:25:22] Thank you, Mr. Chairman. Dean, thank you for your time today and for your testimony. When I look at something like this issue, I go back with my eight years with the Papio NRD, three of those as chairman as well. The use of-- and I flashback to water conservation. When we found our streams coagulated with phragmites and other issues that were sucking water out of the ground like nonstop, we had to act. We were doing something about that. Is this the same kind of temperature on an issue that will get us acting and put money in to different resources to be able to get this done? Because it's-- they're only cedar trees, you know, we don't worry about them

very much. Takes a decade to fill a field.

DEAN EDSON: [01:26:22] Yeah.

KOLOWSKI: [01:26:22] We have a different attitude it seems like, and would you comment on that?

DEAN EDSON: [01:26:28] Okay. Well, trying to compare it to the phragmites might be a little bit more difficult because from what phragmite problem was is that was actually growing in the river channel itself. And so that was plugging up the channels. You don't have that problem with cedar trees in the river channels. Matter of fact, I've got some property where I grew up on the Platte River and when we get-- we've got cedar trees in there but if you got smaller cedar trees and we get a flood that runs through there, it'll kill those cedar trees. So high water will kill a cedar tree. So it's a little bit different management. The different things that people have tried and have worked with the NRD to do certain things like the mechanical removal, Central Platte has a burn boss. And they work with the landowners in the Loess Hills and other areas to do the prescribed burns. He's licensed and certified to help with that. The NRD pays his salary. So, you know, we're taking those little smaller steps. I can honestly-- you know, there's also we can't forget what the private sector is doing. And I am very proud to say that I am part of a group of about four landowners back in the Gothenburg area that we pooled some money together, didn't ask for any government assistance, and bought some milling equipment, saw mill equipment, and bought some other tree removal equipment, and gave a guy a job. And we let him use the equipment and say, here, the trees are ours. You cut them. We don't want any money for it. You make what you want out of it and earn some dollars. Now, it didn't provide him a full-time job but it would provide a secondary income for him, him and a couple other people. And they made dimensional lumber and built little cedar buildings and built cedar decks. And, you know, they made some money. It wasn't anything where,

you know, they could do that full-time. We weren't at that level. With the assistance that we can get maybe with help with market development, you might see more of that.

KOLOWSKI: [01:28:52] Thank you.

HUGHES: [01:28:54] Okay. Other questions? Seeing none, thank you. Okay. We're going to change it up a little bit. Eric Hansen, Twin Platte. Thank you for coming.

ERIC HANSEN: [01:29:11] Thank you for having me. My name is Eric Hansen, E-r-i-c H-a-n-s-e-n. I'm a rancher from Lincoln County, also cover Keith County and McPherson County, mostly operating in the Sandhills. I'm glad to be able to sit here today and tell you that I don't have a huge cedar tree problem at this time. We do have cedar trees on approximately 10 percent of our pasture ground. That being said, over the last ten years I've spent about $50,000 to control the cedars that we do have, mostly mechanically. I also sit on the board of the Sandhills Task Force and I sit on board of the Twin Platte NRD. And as chairman of the land resources subcommittee in July I started the discussion on our relationship with cedars and our history of planting them. And we don't plant, we haven't for probably the last 10 to 15 years, planted many of the cedar trees. We've switched more to the junipers. But in those discussions we forwarded to the board recommendations that we will no longer plan for the installation of eastern redcedar trees within the Twin Platte NRD. We will not provide cost-share assistance for the eastern redcedar tree stock, machine planting, or associated practices such as drip line or mulch. But we will allow for the sale of eastern redcedars for farmer hand plantings and existing windbreaks. That recommendation passed unanimously and has become our policy at the Twin Platte NRD. That's all I've got for you today. I do appreciate this opportunity though.

HUGHES: [01:31:23] Thank you, Mr. Hansen. Are there questions? Senator Walz.

WALZ: [01:31:26] Could you just repeat those recommendations one more time. I'm sorry.

ERIC HANSEN: [01:31:30] We will no longer plan-- we have an employee that goes to landowners creates a plan for windbreaks and plantings. We will no longer plan for the installation of those eastern redcedars. We will no longer provide the cost-share for anything to do with those: the planting, the associated practices which would be the drip lines to water or the mulch.

WALZ: [01:31:59] Okay, thank you.

HUGHES: [01:32:03] What type of mechanical control are you using? What type of machine?

ERIC HANSEN: [01:32:09] We've done the sheer and pile, and we've also done the shredding and mulching both.

HUGHES: [01:32:19] So just attachment on the front of a skid steer?

ERIC HANSEN: [01:32:22] Yes. Yeah. Different attachments. But I foresee this as being a problem for as long as-- it's going to be a continuing problem forever until everybody in the area removes all their existing unused windbreaks or whatever, you know, as long as there's the seed source there it's going to be an issue for us for a long time. Hopefully we've got ahead of that enough to keep it contained and now it's just a maintenance thing.

HUGHES: [01:32:54] Okay. Thank you, Mr. Hansen.

ERIC HANSEN: [01:32:56] But it is expensive. Thank you.

HUGHES: [01:32:58] Thank you. Curtis Gotschall. Welcome.

CURTIS GOTSCHALL: [01:33:13] Thank you, Senator. My name is Curtis Gotschall, C-u-r-t-i-s G-o-t-s-c-h-a-l-l. I come to you as a landowner and also a member of an NRD board. Keep my testimony simple and short. But being passed around to you is my mechanical means of taking care of cedar trees. Myself and my children each, being a son and a daughter, each carry that in the pickup. We see a cedar tree, we cut it. My wife is probably our best cedar tree controller. She can cut about 50 cedar trees an hour with those little nippers if you catch them at that size. And she takes a four wheeler and a four wheeler cart and collects them as she cuts them. And with that practice we have been able to at this time maintain control. I will agree it is an ongoing problem. I guess I'm opposed to any help from the state in any more money or funds being poured into something to do that. I believe as a landowner it's my duty as a good steward of the land to take care of it. I know it costs a lot of money because they purchased land or whatever that have a cedar tree problem. I've done that myself. And I've taken upon myself to control those cedar trees myself. My son has also purchased some land that has a large grove of cedar trees on it that have encroached out into the land. He has spent $3,000 to $4,000 the last three years machine-- hiring a machine to come in and remove those because they were so large. And he was a little upset when he heard that there might be some incentive coming from the state for others to remove their cedar trees and said, what about me? I've already paid myself to get it done. So where's my money? So I guess I would be in favor of rewarding those that have already done something rather than those that need to do something. And if that type of policy could be worked out. But I appreciate you looking at the problem. I appreciate you taking your time to listen to each and every one of us. And I just wanted to keep it short and simple for you this morning. But I did want to say that I think it's that's my problem and I need to take care of it. And I think we all need to be better citizens, better stewards and take care of the land we're entrusted with.

HUGHES: [01:36:00] Okay, thank you. Are there questions? Seeing none, thank you for taking the time today. Dennis Sheehan [PHONETIC]?

DENNIS SCHUETH: [01:36:07] Close. Good afternoon, Senators. Dennis Schueth, D-e-n-n-i-s--D-e-n-n-i-s, last name is S-c-h-u-e-t-h. And I do have my testimony written out here. On behalf of the Upper Elkhorn Board of Directors I would like to inform the committee about our thoughts on the eastern redcedar issue. The Upper Elkhorn NRD believes that the eastern redcedar plays a vital role in a well-planned windbreak I am including charts of the Upper Elkhorn NRD tree sales for your review. Average tree seedlings ordered during this time period is approximately 85,000 trees and approximately 38,500 of them over that time period or 45 percent of the trees ordered are eastern redcedars. The last five year average of machine or hand plants of eastern redcedar is approximately 25,000. Total tree sales, as you can see on that chart, are on a downward trend in the Upper Elkhorn NRD Since 2002. The majority of the trees that are planted are for various windbreaks such as livestock, field, homestead protection, or wildlife plantings. Approximately 70 percent of the real estate in the Upper Elkhorn NRD is rangeland or pasture land and livestock production is a vital part of the economy of that district. To be a successful livestock producer in Nebraska windbreaks are a necessity against Nebraska's cold, wintery, snowy winters, windy winters. Eastern redcedar is the tree of choice by the livestock producers in our NRD for many reasons. Survivability is usually in the 80 to 90 percent rate after planting, adaptable to various soil types, winter-hardy, and grows fast for a quick shelterbelt establishment. This species is not managed properly by the landowner these characteristics can be troublesome. The Upper Elkhorn NRD will assist producers in their windbreak design and discuss the positive and negatives of the species for a particular windbreak. Due to the characteristics of the Eastern redcedar, the majority of the producers prefer to have them as part of their multi species or maybe two-row windbreak. There is no other tree that the district can offer that is as durable as an eastern redcedar. The Upper

Elkhorn NRD does not provide cost-share to producers-- does provide cost-share to producers on all tree species and that does include the eastern redcedar. The Upper Elkhorn NRD will not cost-share on the removal of the volunteer cedar trees. The board feels it is the responsibility of the landowner to bear that cost. If that landowner allowed eastern redcedar to become a problem, why should taxpayers have to pay for their poor management? Potted ponderosa pine is being promoted as an option to replace the eastern redcedar. Ponderosa pine does not have the characteristics as the eastern redcedar. End cost to the producer is going to be higher, handling and storage of potted trees is more difficult for the district. For some reason, that eastern redcedar is not a viable tree species anymore and we substitute them with potted ponderosa pine. The district will have to figure out another way to get the trees out to the job sites and probably have to expand our tree cooler at a cost to the land taxpayers. Stating all of this the Upper Elkhorn NRD hopes that eastern redcedar will continue to be a viable tree species to be offered for various windbreaks. Information and education plays an important role when designing and planting a windbreak. Just as equally important is getting landowners to eliminate volunteer eastern redcedars early on. Economically, it is a lot cheaper to manage than when they are small than when they are two feet or larger in size. Eastern redcedar that are not in a designed windbreak did not get to be 10 feet tall in one year. It probably took eight to 10 years of no landowner management to get to that size. Questions?

HUGHES: [01:40:16] Thank you. Are there questions? Seeing none, thank you for your testimony today.

DENNIS SCHUETH: [01:40:20] Thank you.

HUGHES: [01:40:23] Terry Julesgard. Welcome back.

TERRY JULESGARD: [01:40:39] Thank you. Thank you, Senator Hughes and members of the

Natural Resources Committee. My name is Terry Julesgard, T-e-r-r-y J-u-l-e-s-g-a-r-d. And I appreciate this opportunity to come before you. Most of my comments and the first part my testimony have been covered. It's definitely a management issue. I do appreciate what the Fire Association has stated that we didn't have this problem when we had massive wildfires that kept at bay. Currently at our natural resource district we still do cost-share on eastern redcedar but we promote the practice of the right tree in the right place. We work closely with NRCS for the design of our windbreaks and make sure that the landowners know that there is responsibilities that come along with planting eastern redcedars for maintaining those. I've also included a white paper from the Nebraska Forest Service out at Halsey. They are our major supplier of eastern redcedars. In the 1970, late 1970s there was over-- they sold over around 2 million cedar trees. That number has dropped down to around 230,000 and only 131,000 of those are actually sold in Nebraska. They are actively, like we are, looking for alternative species to use in in windbreaks. We've seen good success with the potted ponderosa pines but there's going to be some extra expenses in handling them also. I've also-- Anna Baum was not been able, wasn't able to be here today there. Their district has a similar to the Twin Platte has eliminated the cost-share on their eastern redcedar so we feel it's important to let the natural resource districts deal with the cedar issues as they see all are conservation-minded and want to make sure that our lands are not being taken over by the eastern redcedar. So with that, I would take any questions.

HUGHES: [01:43:21] Thank you, Mr. Julesgard. Are there questions? Senator Bostelman.

BOSTELMAN: [01:43:30] Thank you, Mr. Chairman. How is the redcedar spread?

TERRY JULESGARD: [01:43:32] How is the redcedar cedar spread? It's basically spread by the seed. I mean, as-- it's your birds like your robins and different ones like that that that's their winter habitat. That's where they-- my place, I live right on the Niobrara River. And we, yeah, around my

property is completely infested with cedars in amongst the oaks. The landowner that has that is working on them but there's still a lot of work there. And I get hundreds of thousands of robins in there that move out.

BOSTELMAN: [01:44:10] Sure. And I'm not. I guess I'm playing into the term devil's advocate a little bit. So my neighbor has redcedars and I don't. Now I get redcedars because my neighbor has them. The birds fly over and drop the seed and I have them. But now I don't have a way to manage them per say if there's no tools out for me. So that's part of the problem too, I think. It's just how it does. I'm not--

TERRY JULESGARD: [01:44:34] Yeah, I have, well, one-- yeah. One of my directors the other day, he says, well, I've been tilling this field for the last 15 years. I've got a cedar windbreak along the one side of it. He says, I'm not be able to no-till any longer because I'm going to have to go in and this to get rid of the cedar trees. It's just, that it's just a problem.

BOSTELMAN: [01:44:59] I understand. Thank you very much.

HUGHES: [01:45:01] Other questions? Seeing none, thank you. And our last invited testimony is Russell Callan. So if you are-- want to give testimony, why, get prepared. We're getting ready. Welcome, Mr. Callan.

RUSSELL CALLAN: [01:45:22] Thank you, Senator Hughes and the committee. Appreciate you being here. I handed in some testimony to kind of keep this a little shorter. And you heard some of the testimony from the NRDs. I kind of wanted to talk a little bit about the diversity, diversity from NRD from one end of the state to the other. I've got similar diversity in my district at the Lower Loup NRD. Excuse me, I did not spell my name. Russell Callan, R-u-s-s-e-l-l C-a-l-l-a-n. Sorry. So

in the Lower Loup NRD I have Sandhills to the north and west, I have urban city of Columbus to the east, I have Loess Hills, I have rolling irrigated ground. So a lot of diversity within the my own district, like the state of Nebraska. So when we start throwing a wide brush at where cedar trees are should be or shouldn't be, I got to be a little cautious. We do provide cost-share on cedar trees but through our cedar tree-- excuse me, windbreak planning with the NRCS, with our own staff, that's when we can be with producers and say, you know, where are you at? What is it you want in a windbreak? So that that planning activity then can be managed. A producer that doesn't want cedar trees on their property, you don't have to plant cedar trees. There are other species, they probably aren't going to perform the cedar tree. Just because of the way a cedar tree is built they make a very good windbreak. Some of the pine plantings that you heard earlier, we're looking at some container stock with the Nebraska Forest Service. Our NRD, one of the Forest Service employees actually in our office we pay a portion of his salary and he is doing some research on container stock and how those perform. So I guess what I'm saying is that as we look at the cedar tree itself, it is a good tool and it makes a very good windbreak. And it's with the diversity of our state. In some places, it's a very good tool. Some places, maybe not. I kind of say that old analogy: a cedar tree in a windbreak is a good thing, a cedar tree where you don't want it's a weed. And that's kind of the way it lays. So I'm going to let you read my testimony, which is pretty close to what you heard before. But I would take any questions, Senator, if that's--

HUGHES: [01:47:48] Thank you, Mr. Callan. Are there any questions? Seeing none, thank you for your testimony.

RUSSELL CALLAN: [01:47:49] Thank you.

HUGHES: [01:47:50] Okay, public comments.

MARK BROHMAN: [01:47:55] Mr. Chairman and members of the committee, my name is Mark Brohman, I'm the executive director of the Nebraska Environmental Trust. It's M-a-r-k B-r-o-h-m-a-n. The Nebraska Environmental Trust has funded over $26 million in cedar tree control across Nebraska in the last 25 years. So we are one of the major players when the question was asked who is funding some of these burn associations, providing equipment, training, working with the NRDs, private landowners. It is us, along with Game and Parks, NRCS, and other groups like that. We work with landowners, livestock groups, conservation groups, local state federal agencies, burn associations, the university, and others. What are some of the things that we fund? Burn workshops, education, burn equipment, controlled burns, mechanical tree removal, and then use of wood products. Some of the things were mentioned earlier: wood chips, wood mulch, lumber, wood fuel, making pellets, and biochars sort of the latest thing that's being talked about. We held an eastern redcedar seminar at Halsey earlier this year, back in April, April 25th. And we had about 75 people attend that. We had a lot of the NRDs from across the state giving their perspective, we had a lot of landowners. The one thing we did hear over and over was we didn't think it was coming our way but it has. There are people in the far Panhandle that don't think it's a problem and it's not going their way, but it is. You know, I grew up in the Custer County area on the edge of the Sandhills and in my lifetime I've seen the trees come in, especially like in the Calamus area where there were very few trees. Now there are a lot. So we had a couple of landowners there were from that part of the state and they came in and they said, when they grew up, and they were a lot older than I was, there was no problem. But now there's a problem. So we're here today to let you know that we're committed to funding projects such as we have in the past. I don't know policy-wise what this group of folks can do but I do think we need to examine what's going on. The question was asked about research of male or sterile eastern redcedars, and I did have a quote from Ryan Armbrust with the Kansas Forest Service and Kansas State University. We had invited him to come up to Halsey but he was unable to. So he had sent me a note and said the economics of producing rooted male eastern redcedar is poorly understood but will clearly cost at least two to three times as much as traditional

seeding production. Part of that is trying to, you know you can't tell the sex of a cedar tree, and some people think that it may even can change over its lifetime. So it's going to be really difficult to get a handle on that. But we've indicated we're more than willing to help do and fund research with the university, the Forest Service, whoever might be interested in doing that. It was just mentioned, the speaker before me, that they're looking at ponderosa pine. They're finding that if you have more soil on the root that you can get a lot higher viability. And that's been part of the problem with some of those species in the past, you haven't been able to get the growth out of them and the number of success rates. The success rate percentage is a lot lower, which is true. But that's what makes the eastern redcedar the problem, it is so hardy. And once it gets established in an area, we don't have those wildfires that we once had, they do spread. And it was also mentioned by a couple NRDs, it is their number one tree that they're still selling. Whether they're providing cost-share or not, they're providing them. One of my board members said, when you get in trouble you got to stop digging. And so I think that's part of the problem is we have to really look hard, especially in central and eastern Nebraska where trees are still being provided. We've got to try harder and not be providing that seed source on the landscape. So with that, I'd be glad to answer any questions.

HUGHES: [01:51:20] Okay. Thank you, Mr. Brohman. Questions? Senator Bostelman.

BOSTELMAN: [01:51:23] Thank you, Mr. Chairman. Going back a little bit to some of our testifiers before with the prescribed-- Sandhills Task Force, Prescribed Fire Council and that. Something come to mind was yours as we're talking about this. Have you thought of or is there anyone has discussed having the equipment: drip torches, shovels, flappers, tanks, water tanks, those type of things? Or even systems you can, you know, fire-- grass fire rigs you can put on the back of your UTVs, your pickup and that to have those purchased and set in a place similar to what we do with no-till? And so we have individuals throughout the state that would coordinate and people would have to be trained and stuff in order to use it, if you will, but then it's available for

them to come rent?

MARK BROHMAN: [01:52:11] That's exactly what we do with Pheasants Forever, Quail Unlimited and other some of the burn associations. They get what they call trailers from us and they're just like we've provided funds for no-till drills for years at the Environmental Trust, probably the largest provider of no-till drills for NRDs and groups like that across the state. We're also probably the largest provider of equipment at this time to, you know, mostly Pheasants Forever and Quail Unlimited chapters. We've got several of these burn trailers on the landscape and they're used by conservation groups but anybody can come in and get them. And the same thing with prescribed, you know, controlled burn units. They've got some of this equipment they've purchased from [INAUDIBLE] the trailer with the UTV in it and the walkie-talkies, the burn jackets, the flappers, the oil drip torches, all those kinds of things. So it's kind of a ready-made package. I think there are nine or ten controlled burn units across the state in Nebraska and burn associations. And it's mostly based on landowners helping landowners. But there is problems with liability. People are afraid of the liability. You get one landowner next to an area that doesn't want to burn, we ran that with our ranch recently. We had two out of five land owners surrounding our ranch that didn't want to participate and were afraid to have fire. And so it made everybody uneasy about burning the other parts of the properties. So we are participating and I think that's a good way to get started. But we're maybe just keeping even. I think Dr. Twidwell mentioned that, you know, there's 30,000 acres of these things coming on every year. And we have to burn at least that many to keep even. And so that's what we've been able to do maybe the last couple of years. But it's going to take a lot more money, a lot more effort.

BOSTELMAN: [01:53:39] Thank you.

HUGHES: [01:53:42] Additional questions? Seeing none, thank you, Mr. Brohman.

MARK BROHMAN: [01:53:44] Thank you.

KATIE TORPY CARROLL: [01:54:02] My name is Katie Torpy Carroll, K-a-t-i-e T-o-r-p-y C-a-r-r-o-l-l, here today representing the Nature Conservancy. Mr. Chairperson and respected members of the committee, thank you for the opportunity. The Nature Conservancy is a conservation organization working across the world to conserve ecologically sensitive land and waters for nature and people. We've been working in Nebraska for over 50 years, specifically along the Niobrara River. We have a complex of woodlands and grasslands, 56,000 miles in that area that we manage for conservation purposes. It's also a working ranch. All of the impacts of eastern redcedar that have been described today touch down on our property, perhaps none so devastating to our mission than the loss of biodiversity and land productivity. We definitely feel the impacts of reduced grassland birds; the impacts to beetle species, including the federal endangered American burying beetle and small mammal species. Now, with the 2012 fire, wildfire, the Fairfield Creek wildfire, we got an unexpected toehold. Forty-six square miles burned on our preserve that day, an area about half the size of the city of Lincoln. Now the cost to the state in Nebraska was about $3.2 million. And that was in a year that saw $12 million in damages from wildfires. For us at the preserve, our impacts were primarily to lost grazing, lost grazing income. And we also had to replace 60 miles of fence line. It gave us an unexpected demonstration opportunity, however. The areas that we had conducted spring burns on did not burn during that wildfire and in fact abated the spread of wildfire during that incident. That fire really incentivized us to double down on our existing redcedar control management tactics. We, between 2014 and 2017, were able to leverage $750,000 in federal, state, and private funds, mostly in the form of cost-share, to remove 1,400 acres of eastern redcedar. During this time we also intensified our fire training exchange program where we train burn officials-- burn professionals to provide burns safely and to communicate effectively to during those burns, as well as to communicate to the public the benefit of those burns.

In 2018, we added a burn boss and we are moving our burning off TNC properties where we conduct about 4,000 to 5,000 acres of burning, controlled burns annually. But we're moving that off TNC grounds to public and private lands and our targets are 7,500 acres annually. We couldn't do this of course without the support from the Environmental Trust and Nebraska Game and Parks Commission, the National Park Service, Fish and Wildlife Service, Sandhills Task Force, Pheasants Forever, and volunteer fire departments, among others. However, in spite of all these positive and productive partnerships, much remains to be done. The program and the continued viability of our fire training exchange hinges on continued and enduring funding that is anything but certain. And really to get truly to scale on cedar control and to restore our grasslands and woodlands we must mechanically remove approximately 13,000 acres on the preserve, at a projected cost $8.3-- or $8.2 million. Yet, we realize that we're very fortunate to receive the funds we've received to date and to have the resources to apply for those funds. That said, we're highly aware that there are many landowners less equipped to do so which is what makes it so essential that we achieve-- that there be greater statewide coordination to systematically address this issue. We need a consensus on priority areas and we need to match that with expanded and new sources of funding. And we also need to support prevention efforts for prescribed fire is essential to both preventively addressing new growth, as you've heard, as well as maintaining mechanically cleared areas. And lastly, we ask that you consider addressing the seed source or control of sale. In closing, while we think our approach is a good model, without that comprehensive statewide coordination individual efforts will not accrue fast enough or at a large enough scale to address the problem. If you wish to visit our preserve and see these efforts firsthand, we invite all of the senators of the members of the Natural Resources Committee to visit us up at the Niobrara Valley Preserve. Thank you.

HUGHES: [01:58:56] Thank you. Are there questions? Seeing none, thank you for your testimony. Go ahead, sure.

KATIE TORPY CARROLL: [01:59:07] I forgot to mention the crux of it. So the mechanical removal is about $600 I think as was described per acre to remove. So that's how we got to that figure. Our prescribed burning efforts were doing that at anywhere between $30 to $40 an acre, so it's a huge difference.

HUGHES: [01:59:26] Very good, thank you. Thank you for sharing that. Welcome.

JOHN ERIXSON: [01:59:36] Thank you. Good afternoon, Senators. Members of the Natural Resources Committee, Chairman Hughes, my name is John Erixson, J-o-h-n E-r-i-x-s-o-n. I am the director of the Nebraska Forest Service and Nebraska state forester. I am here today speaking on my own accord not on behalf of the University of Nebraska. Eastern redcedar is a native tree to Nebraska. By definition, native determines it cannot be labeled as an invasive species. However, eastern redcedar is a species we've seen a dramatic increase in the population over the last several decades. In 1972, 25,000 acres of Nebraska was considered eastern redcedar forest. Today, that number is slightly over 330,000 acres. If I can draw your attention to figure 2, the blue bars represent acres that were considered eastern redcedar forest five years ago during the last inventory cycle. And through management we've seen those acres convert back to their traditional land use. In contrast, if you look at the orange bars there, those are acres that were not eastern redcedar forest five years ago and they are today. So the uncontrolled spread of eastern redcedar into our grasslands has several negative impacts from an ecological and environmental standpoint as well as an economic standpoint. Cedar often grows as wide as it does tall. Occupying space and out-competing other natural vegetation. This results in less grass being available for grazing animals and nesting wildlife. Across Nebraska it is easy to find examples of areas where cedar once or now dominates the landscape and these areas were once dominated by grasslands. In our forests eastern redcedar often grows in the shade of our pine and our deciduous trees, resulting in changing the function of these forests. When eastern redcedar occupies the understory of the stand you no longer get

regeneration of our desired plant community: our pine trees and our hardwood trees. And the stands will eventually become eastern redcedar forests over time. Eastern redcedar must also be recognized for the benefits it provides in the form of windbreaks in shelterbelts, as well as with manufacturing. In western Nebraska, west of the 100th meridian, eastern redcedar is one of the few species that survives and is still today used by land managers for windbreaks. In my recent travels to Kimball County, eastern redcedar is a common windbreaks species. There's often one to three rows of eastern redcedar. Most of the windbreaks or new windbreaks in that area have a cedar component. I asked land managers, you know, why are we using eastern redcedar in these areas? And what the most common response is, it's the best tool or the only tool we have in our tool box. It survives. That's a big thing. It grows well, it grows fast. It does not spread naturally in those areas. It provides the shelter we need for our homes and protection for our livestock. The Nebraska Forest Service is currently sampling windbreaks across the state as part of a greater effort to characterize all windbreaks from North Dakota to Kansas. As part of this effort, Nebraska Forest Service staff are sampling windbreaks. We've sampled 1102 windbreaks across the state with some in each of our counties. In the sample, 70 percent of our windbreaks have a significant component of eastern redcedar or eastern redcedar is the dominant species of those windbreaks. The Nebraska Forest Service provides cost-share to landowners to assist with the management of forest lands. As part of this effort, landowners work with staff and other natural resource professionals to remove encroaching cedar from our pine and our hardwood forests. They manage their eastern redcedar stands for future forest products and they remove eastern redcedar to reduce the risk of wildfire and improve the rangelands. In conclusion, eastern redcedar is a tree in Nebraska that is important but it must be managed. As natural resource professionals, we have a responsibility to utilize all the tools that are in our toolbox. This includes prescribed burning, mechanical treatments, and harvesting timber for economic gain. So thank you for your time. I would be happy to entertain any questions.

HUGHES: [02:04:25] Thank you, Mr. Erixson. Are there any questions? Seeing none, thank you

for your testimony. Welcome.

MATTHEW HOLTE: [02:04:55] Good afternoon, senators, members of the Natural Resources Committee, and Chairman Hughes. My name is Matthew Holte, M-a-t-t-h-e-w H-o-l-t-e. I serve as the fire operations team leader for the Nebraska Forest Service. I'm here to share information on LR387 and testifying neutral on my own on my own behalf, not for the university. I have over twenty years of experience in wildland fire prescribed burning with the United States Forest Service and the Bureau of Land Management. Prescribed fire can be an exceptional tool for managing the vegetation on the landscape when used correctly and under the appropriate conditions. Utilizing prescribed fire in eastern redcedar stands, particularly mature stands, is tricky. One of the unique fire behavior aspects of eastern redcedar is that it is a species that unless the trees are abnormally dry they can actually be used as a firebreak if the conditions are right. This poses a significant challenge for prescribed fire managers when they try to utilize fire as a tool for managing these larger mature cedars. In order to run a fire through the larger trees a burn boss needs high winds, high temperatures, and low humidities. This approach to burning is counterintuitive for wildland fire managers as these conditions are often the same that you'd expect in wildfire conditions where full suppression of a fire would be expected. In contrast, using prescribed fire to manage smaller young cedars is a very viable and effective tool. In stands where significant grass refined fuel component is present, cedar is killed by fire due to the heat of the flames and individual trees torching. In stands with larger trees or stands with many trees per acre, another approach for prescribed burning is to do prep work before burning and using mechanical treatments prior to a prescribed burn is an effective method to increase the fuel load on the ground to carry a fire. This method provides more ground fuel to carry fire to consume the unwanted tree while allowing for lower intensity fire and a more manageable burn. BehavePlus is a fire modeling system used by prescribed fire managers and burn bosses to predict how fire will act under certain conditions. This modelling system can help provide a reasonable estimate of expected fire behavior given the

particular fuel type, weather conditions, and terrain. If you look at the chart that I included there, you can see a low-risk, moderate, high-risk, and extreme risk runs there. And the actual runs are in the back with your packet. But you can see there's not a whole lot of difference between low-risk and moderate. By just increasing the winds a little bit you double-- you almost double the flame lengths. So the margin of error with prescribed burning is extremely small. Table 1 in the back includes a list of escaped prescribed fires, along with their incurred costs and the repercussions of suppressing that burn that escaped and were converted to a wildfire. The state of Nebraska is in a unique situation as none of the state agencies have a true suppression or prescribed fire force. Burn associations have developed to perform the burn themselves, use contractors, or rely on volunteer fire departments. There's roughly 200 hours of classroom training needed to become a qualified burn boss using the national standards. It also requires individuals to work on a position task book and to have competency at several other positions before initiating said task book. So it is difficult to become or to find-- it is difficult to become or to find a qualified burn boss to conduct these burn operations. In Nebraska we only have one national wildfire coordinating group qualified burn boss within the state agencies and that is myself. Secondly, asking the volunteer fire departments to assist seems reasonable. However, many of their insurance policies do not allow it. Most of the volunteers have day jobs and are not able to assist. And prescribed fire is not considered an emergency and with limited staffing of volunteer fire departments it could result in a delayed response for a life-threatening emergency elsewhere. Finally, burning without qualification and experience is a huge risk. If something were to go wrong, whether it be loss of property, loss of life, the first place that any investigation would center would be over the qualifications of that burn boss. The burn boss is responsible for every person, action, decision that happens on that prescribed fire, not to mention the additional costs of suppressing the fire. Prescribed fire is a valuable tool in addressing redcedar encroachment. However, improper use and lack of training can and has led to the loss of life and property, including here in Nebraska. Thank you for your time. I'd be happy to answer any questions.

HUGHES: [02:09:19] Thank you, Mr. Holte. Are there questions? So are you located here in Lincoln?

MATTHEW HOLTE: [02:09:24] I am.

HUGHES: [02:09:25] Okay. And so if a burn association wanted you to come out and supervise or train that's part of your job? Or is there an expense?

MATTHEW HOLTE: [02:09:35] I would be more than happy to assist as far as like training capacity or being the Type 2 burn boss if anybody were to reach out.

HUGHES: [02:09:45] So that is part of your job description? There's not a cost of that to the local group?

MATTHEW HOLTE: [02:09:50] No.

HUGHES: [02:09:50] Very good. Thank you for your testimony.

JERRY STILMOCK: [02:10:03] Chairman, members of the committee, my name is Jerry Stilmock, J-e-r-r-y S-t-i-l-m-o-c-k, testifying on behalf of my clients: the Nebraska State Volunteer Firefighters Association and the Nebraska Fire Chiefs Association. Mr. Holte hit on a couple things, and one of the most important ones was there are no firefighters within state agencies or government units that go out and fight wildfires. It lands on the hands of volunteers. So in 2012, when almost half a million acres burned, they were predominantly firefighters of the volunteer nature on the scene until federal representatives came in on a couple of fires. Think in terms of

Ainsworth, Nebraska where one of those huge fires was. That was a 10-day fire. And so the significance of what's happening is tremendous with eastern redcedar. Senator Kolowski was a member of the Legislature when Senator Davis introduced LB634 in 2013 as a result of what happened in 2012. And others of you obviously followed along what was happening, not as a legislator but in your own personal lives, perhaps. Of significance during that period of time we learned several things. One of it, we had 16 testifiers come into that hearing and many of the same people or organizations that were represented at that time. And what was the major focus of it? Eastern redcedars. So it repeats itself for five years later. I think the senators at that time included-- not I think. I know senators at that time included funding in order to help the reduction of fuels which Mr. Erixson as the State Forester spoke of already. My only other comment, because others have covered the items very, very well, a little bit about what happens when a burn plan is submitted. That falls on that burn plan is reviewed by the fire chief or the designee of the fire chief having jurisdiction. And that designee has to be within the realm of the fire department, it can't be the village clerk for example. Senator Wickersham first had legislation in its original form in the latter part of the 1990s that had his first attempt to legislate-- legislators' first attempt to set out parameters of what that plan should include. Senator Annette Dubas at the time then, during the early part of the 2000s, took on a two-year study on her own independently, and looked at several factors. What about the agencies coming in that want to organize responsible plans? What is their liability coverage? What is their training? There's a gentleman just Testified, Mr. Holte, is part of the crux of it is is what training should Nebraska require for those that are going to be burn bosses? Should it deviate at all from the national standard? And at that time Senator Dubas, in doing the research, and then the upgrade to legislation through Senator Dubas' legislation was ultimately passed, was no, the deviation should not be made from the national standards. I'm just thankful that you brought it again, you're looking at it. We need to keep on it. And most importantly as when those fires hit us the volunteers that are going out to answer the call. Not having a state suppression team, it puts a tremendous strain on the volunteers. That concludes my comments. Thank you for

the opportunity to come before you.

HUGHES: [02:13:18] Thank you, Mr. Stilmock. Are there questions? Senator Bostelman.

BOSTELMAN: [02:13:22] Thank you, Mr. Chairman. Mr. Stilmock, thank you for coming today to testify. Our other problem or issue at what I hear it, and it falls under your wheelhouses as well as the previous testifiers, we have large redcedar now. We're not talking about small ones that we can burn and [INAUDIBLE]. Because we have these large trees that are out there. When there is a fire in an area and it's hot enough to ignite them that becomes a huge fire risk because that allows that fire to get hotter. Plus it allows it to move quicker or to heat areas. Plus, you're going to have the winds create that firestorm, if you will, to go across. And that goes back for volunteers pretty much while they're are out there trying to fight these fires. Ainsworth fire, I had friends up there that were involved with that, so I know what, you know, a little bit what you're talking about. So I guess my comment is, and I really can't speak to it or maybe you can speak to it, is I understand where there's benefits with this. But also what we're hearing is, is we're at a point now where it seems to me is we have not done our due diligence as landowners. And that due diligence is, is controlling the redcedar that we plant or have planted placed on our property. Now we're at the point of the time where we have a significant problem because we have these large trees. And how now-- how do we now best address that? Fire not being one of them is where I'm kind of going with this, so we have to look at either chemical or mechanical. Because the risk is way too high potentially in order to get that, the environmental conditions: the humidity; the wind; the dryness; the fuel for that large trees, those large stands to go to burn. We're creating a huge potential for that to spread and get out of control. To do a controlled burn with that is pretty dangerous or risky. I don't know if there's a question other than the comment and that I don't see-- we do have some aerial resources and other resources with that but I think we're beyond the point of in some sense of management. That's what are we going to doing now with these large trees in these large areas. I don't know if you have a

question of that.

JERRY STILMOCK: [02:15:37] It's 3:15 or 3:15-ish. You ask the questions and I did the best I can respond politely and quickly because there's others that want to testify. But you broach an area that merits a nice, long conversation. But I'll be as brief as possible. Marketing was something that LB634 brought in a component. But you asked the question. So we have-- we have a question of one of the other testifiers is what do, you know, we don't really have a market. We have a product but we don't have a way to market it or the location of it. And the transportation of their product is so far it defeats the whole purpose, so we're stagnant in that regard. I don't know. I was intrigued by the manure mixing with the chips. It's like really that's a possibility. So the industry is thinking and the Nebraska Forest Service is thinking and working hard on that issue in terms of the marketing part of it. You said an important thing, and Senator Kate Sullivan at the time said the same thing, she said I know what I do on the weekends because we're a farm family, we're a banking family. The bank is tended to by my husband Mike. My part is done, I do what I can. But I'm also a landowner so I go out and clear the redcedars when I'm at home. So why are people coming in asking for money? And that's an observation, that's a lot of personal account because you all heard what the NRD said. It's like where do we get the money from, you know? It's not so dissimilar, if you allow me to digress for a moment, is the city of Omaha when they annexed properties and the roads were in an unsatisfactory position. So those people bought the property, they have less than up-to-standard roads. So all of a sudden the question is, well, what about my subdivision? I have this house, I own a $300,000 house and my roads are substandard. City, you annexed me, make the city taxpayers pay for my road to be improved. Well, and that's the question that you've heard this afternoon framed a different way. My land is inundated with redcedars, make somebody pay to clear them. And you saw what the city of Omaha did on a much smaller scale is they withdrew. They would not spend-- my recollection, we wouldn't spend the tax dollars to correct a problem in one single area because of what happened when those people bought that area that was, you know,

"malmaintained." So you're wrestling with the same question of do we use NRD dollars to pay for somebody because they were lax in caring for their pasture and their grassland? Wow. That's huge. That's huge. So I didn't answer your question, all I did was comment back at it. And I think I'm wasting your time, so I better be quiet.

BOSTELMAN: [02:18:03] Thank you.

JERRY STILMOCK: [02:18:04] Thank you for the opportunity.

HUGHES: [02:18:05] Thank you, Mr. Stilmock.

JERRY STILMOCK: [02:18:05] Yes, thank you.

ED HUBBS: [02:18:19] Thank you. Good afternoon, Chairman Hughes, committee members. My name is Ed hubs, I'm representing Audubon Nebraska and our centers and sanctuaries within the state. My name again, Ed Hubbs, it's E-d H-u-b-b-s. I would just try to keep it to the point and short and sweet, since most people have already covered my main points. I just want to say that Audubon does recognize that there are many ecological and economic impacts caused by this cedar tree invasion. Prairie birds in particular, which is what Audubon is focused on: bird life and wildlife in general. But prairie birds have shown the most consistent population declines of any bird species in North America and our grasslands within the state of Nebraska are a vital breeding and migratory range for many of these birds. Audubon would support any effort that allows the grassland, the stewards of our grasslands, mainly private landowners, to do whatever is needed to sustain both profitability and sustainability for wildlife on their own lands. We think that proactive efforts are important and essential from the landowner to think forward and think ahead in order to reach these goals. Especially considering cedar. In that regard, I would like to comment on some of the things

people have said regarding the prescribed burning and some of the training that is required. Myself, at the Audubon center that I work at just southwest of Lincoln here, we rely almost entirely on volunteers. I'm the only paid staff. When we do a prescribed burn, I rely on some of the people in this room, but many other people who are private landowners doing-- donating their time and resources to help me burn my land. If we were to-- it has been recommended or mentioned that maybe the training that's required to become this high level burn boss is hundreds of hours and lots of paperwork. If we were to require that kind of training to my volunteers, I would not have any volunteers. And as one person I cannot burn by myself. So I think it is very important that we consider that the landowner still needs to be at the root of the solution to this problem. With that, I'll take any questions.

HUGHES: [02:20:57] Okay. Thank you, Mr. Hubbs. Questions? Seeing none, thank you for your testimony.

ED HUBBS: [02:21:01] Thank you.

JULIE BAIN: [02:21:14] Good afternoon. My name is Julie Bain, J-u-l-i-e, last name, B-a-i-n, I'm a district ranger at the Bessey Ranger District of the Nebraska National Forest and Grasslands. We are part of the USDA Department of Agriculture Forest Service. I did have prepared statements but I might go off script a little bit, just because a lot of people have already said things. I would like the committee to know that National Forest System lands comprise nearly half of all public land in Nebraska. They're a priceless resource for Nebraskans or anyone wanting to experience Nebraska's wild places. The Sandhills units of the Forest Service comprise over 200,000 acres. We have the Bessey Ranger District near Halsey and the Samuel R. McKelvie National Forest southwest of Valentine. In the last two years alone we've documented visitors from all 50 states and a lot of countries from overseas. So one of the reasons I think that people need to be concerned about the

Bessey Ranger District near Halsey is we have a gigantic seed source. We have the world's largest hand-planted forest. It was originally 30,000 acres. In the 60s there was a fire and we're down to 22,000 acres and one of the main species of the species that were planted, ponderosa pine, jack pine, and eastern redcedar have survived. What we're working on very hard now is keeping the grasslands grass. So in terms of other people have spoken to the fact that getting rid of the larger trees is-- we're doing it but it's cost-prohibitive. We do do the prescribed burning. The our forest was an order of magnitude less than any of the other prescribed burns that happened across the rest of the country. We've had since 2015 we've had help from partners, livestock grazing permit holders, supplemental funding sources. We've conducted prescribed burns and mechanical thinning on over 15,000 acres of public land and we've assisted with the prescribed burning on over a 1,000 acres of neighboring private land. Our partners have been the U.S. Fish and Wildlife Services, Partners for Fish and Wildlife, Rainwater Basin Joint Venture, the Sandhills Task Force, the NRCS, Nebraska Game and Parks, National Fish and Wildlife Foundation, and the Joint Chiefs Landscape Restoration Partnership. The Forest Service also has a master good neighbor authority agreement with the Nebraska Forest Service. It was signed this May, May 22nd, 2018; and we are willing to work in partnership with the state to combat cedar encroachment and protect native rangelands. One of the things I feel like the federal agencies could be very helpful is some of the technology transfer and because we are such a private land state we do have-- I've got two burn bosses on my district that could go out and help. We've been able to help through MOUs with volunteer fire departments but there is that question of liability and whether the federal government can help on private lands. But that's probably an area that would be rich to look into in terms of ways that we could help and go out there and do that kind of burning. In addition to physically removing cedars, the Forest Service has contracted with our National Geospatial Agency to look at the rate of encroachment in the last 20 years. And that should be able to be used for other landowners to estimate how quickly they might be experiencing the problem. And. I think another thing for us too, some people have spoken about product and we have received the call about the person looking for 10,000 pounds of

piles. We've got piles sitting out there. One of the problems we have is our roads. So our roads are so sandy that you can't get a log truck down there. So getting it out, you know, we've got the trees and the product for anyone who needs it and we need them cut. But that's one-- I feel like it's a relatively small block because humans have figured out so much. But that is-- that is a block that we have. So that's I have to say. Thank you very much for paying attention to this issue. I really think it's important for the grasslands. Thank you.

HUGHES: [02:25:44] Thank, Ms. Bain. Are there any questions? Seeing none, thank you for your testimony. Welcome.

TELL DEATRICH: [02:26:00] Thank you, senators, for being here today. My name is Tell Deatrich, T-e-l-l D-e-a-t-r-i-c-h. We've heard a lot of talk today about the Loess Hills, Loess Canyons. I'm here representing the Loess Canyons Rangeland Alliance. We are a very large burn association. Our area that we are tasked with affecting is 300,000 acres. Obviously, not all the landowners in that area are on board with what we do. But to this point we've burned approximately 70,000 acres and we have several 3,000-acre burns slated for the next couple of years. We were formed out of just a basic need. We didn't have a market for the trees we had, we didn't have a viable option of mechanically controlling them long-term. And so in conjunction with a couple government agencies, we got the idea and got started. My dad was one of the first ones on board in 2002, so I've been doing this as long as the association has been around minus a couple of years in college. There's been some talk about using trees for posts and whatnot, and again, that's a marketable issue. But my grandpa planted cedar tree posts for corners and, subsequently, I pulled them out. You know, they're not a long-term solution and that's a different discussion. But you're looking at, if you're lucky, 20 years, 15 years on planting a post like that. And our burn association would disagree with people who say that you can't burn big trees and that it takes extreme conditions to burn big trees. We burn big trees on steep slopes in large burn units fairly regularly.

And by large, 600 acres is kind of a slow day for us. We have 85 members, we're regularly getting 60 to 70 people come to every burn depending on-- sometimes we'll have some down days if we have a smaller unit. But we have a very committed membership group. If you want to know more about being able to burn big trees in extreme conditions, you need to do to talk to Dirac. He knows the science. And I probably shouldn't even use the word extreme conditions because you can get it done with the state mandated parameters. The benefit of a burn group has on our community is something that we've seen time and time again. A couple of years ago we had a wildfire break out within Sight of my house. And it happened to be during our normal burn season so conditions were right for this to be quite the wildfire, and it was. It did a nice job killing a lot of trees. But our fire department in Curtis has two grass rigs and we showed up with more than eight units plus the water tenders that we had full of water on-hand already. We more than doubled the response to this fire and we learned a lot in that. Yeah, you can't take somebody that's good at prescribed fire and have them start putting out fire. It's different-- it's a different process but we have still learned to work with our volunteer fire department and our volunteer fire department has been helpful working with us. Now, problems to growing burn associations in areas that are not excited about fire, they have to see the need. If you're going to say that-- they have trees, they have a problem, they're going to have to perceive that they have a problem. And that's why we were successful was because our problem became very real to us. We would love to help other units. And if you want to see other associations-- excuse me, if you want to see us burn, we have people come and help us all the time. And that's where our training has come from is within the group. I grew up doing this. A lot of young producers in my area, we grew up with fire and it's helped to grow. Are there any questions?

HUGHES: [02:31:05] Any questions for Mr. Deatrich?

WALZ: [02:31:08] I just have a quick question. So do you also rely on the volunteer fire department to come and help? Or where does your manpower come from I guess?

TELL DEATRICH: [02:31:17] It's mostly all landowners and their employees. The volunteer fire department has supported us. We've never had to call the volunteer fire department and we've never had a breakout big enough that we thought, oh, we'd better get this cleaned up. We keep them small. If you involve your volunteer fire department, if there is a problem somewhere else because it's a good burn day, if you have a fire somewhere else, they're tied up and it lengthens their response times. So we wanted to be self-sufficient. We do have a few volunteer members that will come to a burn and help. And that's been beneficial for everyone.

WALZ: [02:31:57] Thank you.

HUGHES: [02:31:58] Okay, any other questions? Thank you for testimony and your insight. Welcome.

FRANK ANDELT: [02:32:13] Hello, and thank you for the opportunity to provide some comments. My name is Frank Andelt, I'm speaking as a landowner with property in Saline County. As a retired-- semi-retired farmer and a retired wildlife biologist--.

HUGHES: [02:32:29] Excuse me, could you spell your name please?

FRANK ANDELT: [02:32:30] Oh yes. Frank, F-r-a-n-k, A-n-d-e-l-t.

HUGHES: [02:32:36] Thank you.

FRANK ANDELT: [02:32:37] I am also a member of the Tri County Burn Association for about ten years, since that group formed. This is a group of about 50, mostly landowners that work

together using prescribed burning to improve grasslands. I support LR387, as I recognize that eastern redcedars have become a big problem in many parts of Nebraska. In my specific case, I remember about 45 years ago traveling some 50 miles from our farm to dig eastern redcedars that we're growing in a pasture in northwest Lancaster County so we could plant them in a wildlife shelterbelt and windbreak on our farm. By digging the trees, we could get a quicker start than planting smaller seedlings. We had to travel that far because eastern redcedar at the time were quite rare in most of Saline County except where they had been planted, mostly in farmstead windbreaks. On our farm nowadays, we're removing some of the eastern redcedar that we planted back in the 70s and 80s. And in other cases, I have even been selectively removing female trees from some of our plantings to prevent their spread. Here in southeastern Nebraska, eastern redcedars can be kept in check if landowners keep on top of the situation. Prescribed fire is the easiest and most effective method of removing eastern redcedar from grasslands if they're not allowed to get very large. If eastern redcedars are not controlled at an early stage, the cost of removal can easily exceed the value of the land on a per acre basis. Some thoughts on possible solutions to eastern redcedar, to the eastern redcedar problem. First, I would say it would be good to discontinue planting eastern redcedars in counties where they are the biggest problem until the time when the sex of seedling trees can be determined and only male trees planted. Address liability issues that might be preventing landowners from making use of prescribed fire to control eastern redcedar. The third thing is to support efforts to identify alternative species to use in wildlife windbreak and other plantings. For example. I've found pfitzer type junipers to be a good substitute for eastern redcedar in wildlife plantings. Also encourage efforts to find new uses for eastern redcedars, as you've heard people talk about here before. In summary, eastern redcedars have become a big problem in Nebraska but we do have options to deal with them. Once again, thanks for the opportunity to give some comments.

HUGHES: [02:35:25] Thank you, Mr. Andelt. Are there questions? Seeing none, thank you for

your testimony and your patience. Welcome.

DENNIS OELSCHLAGER: [02:35:38] Thank you. Chairman Hughes and members of the Natural Resources Committee, my name is Dennis Oelschlager, D-e-n-n-i-s O-e-l-s-c-h-l-a-g-e-r. We have owned and managed a little over 500 acres in eastern Saline County on the eastern edge of the Rainwater Basin. The land is mostly pasture, dryland row crop, and wooded drainage areas. We have land enrolled in a conservation reserve programs and our land adjoins an NRD flood control and recreational area. We manage our land with an emphasis on conservation and wildlife habitat. We have a big problem in continuing management challenges with the spread of eastern redcedar in our area. Without constant control efforts, ERC, eastern redcedar, will overtake idle areas and grow into and destroy fences. Control is a big problem along county roads where birds on wires are a constant source of eastern redcedar seeds. History now available from Google Earth, photos in our area showed clear farmland transformed to a thick eastern redcedar forest in less than 20 years. When it became apparent I was going to spend most of my free time cutting eastern redcedar out of our pasture and conservation and reserve ground and was not going to be able to keep up, I started learning about prescribed fire about 20 years ago. And a big thank you to the Nebraska Game and Parks people who came out and provided some hands-on training to get me started. In 2009, we organized the Tri County Prescribed Burn Association that Mr. Andelt mentioned. Landowners and volunteers, neighbors helping neighbors focusing on prescribed fire in Lancaster, Saline, and Seward counties. We have extended that into many other surrounding counties and the smoke from our burns has been readily visible from the higher floors of this building. As Frank mentioned, we've grown to now regularly over 50 paying members and a contact list of more than 100 people who help with our burns. We have now helped landowners with prescribed fire for nine years, more than 4,300 acres and more than 150 burn areas. We have never had a fire escape that required assistance. Thanks to prescribed fire and our burn association, I personally went from not having enough time to keep up with eastern redcedar to having time to help others, planning and managing

their prescribed burns. Of course we receive help from those members when we do our burns and that's a big benefit to us. There are clearly a lot of people in Nebraska who are part of this growing community. People who recognize the need to control eastern redcedar, as well as those who understand the benefits of prescribed fire. I know I speak for many of them today when I say we appreciate the Natural Resources Committee and elected representatives who recognize a need to consider public policy in support of efforts to control eastern redcedar. I thank you for your time and service as our elected representatives and the opportunity to be here today.

HUGHES: [02:39:15] Thank you, Mr. Oelschlager. Very good. I got one fight, finally. Any questions? Seeing none, thank you for your testimony. Welcome.

ALLAN MORTENSEN: [02:39:41] Thank you, senators. Allan Mortensen, A-l-l-a-n M-o-r-t-e-n-s-e-n. I'm here today as a landowner born and raised in southern Lincoln County, and a member of the LCRA, the Loess Canyon Rangeland Alliance, which you've learned today is a prescribed burn group. I've seen the encroachment of the redcedars be more and more prevalent. For the last 40 years I've spent countless hours during the winter days chopping cedars by hand, only to have them replenished to be thicker than before within a few short years. I watched the grazing lands become smaller and smaller with return revenue becoming lesser as years go by but the taxes on that land continue to rise. I've passed out or handed some pictures from a neighbor that had the foresight to take over the years, starting back from 1965 through one of the burns that we've done, we did in 2017. With use of prescribed burn to reduce the spread of eastern redcedars in our area of the state, working with the LCRA we have started to regain some of the economics of our land back. Being part of the LCRA have given me and the 85-plus other members a strong training of the use of fire and fire safety to be able to conduct prescribed burns on private lands. Since 2002, the group-- the group has burned over 70,000 acres without any major escapes or having to call for the fire department for help. Average size now as we conduct our burns is approximately 1,500 acres per

burn. With the success of burn, burning these acres, we as the LCRA have learned the respect of local fire department-- have earned the respect of local fire departments, even to the point of being available for a second respond help with large fires and in uncontrolled burns. These burns are possible with assistance and partial funding from such organizations as the natural resources districts, the Pheasants Forever, Quails Forever, and the Environmental Trust. Through prescribed burns that we have accomplished to date, we as landowners in the LCRA have seen a deafening decrease in the redcedar, eastern redcedars, resulting in gaining some back of our grazing acres, which is an economic increase to the landowners. We also see more mule deer, quail, pheasant, bobwhite, prairie chickens, and these birds that have burned along with the other many natural grasses. I appreciate your time today. Thank you.

HUGHES: [02:42:38] Thank you, Mr. Mortensen. Are there questions? So what can-- or what would you like state government to do to help you in your control of eastern redcedar? Anything?

ALLAN MORTENSEN: [02:42:52] Some of our-- some of our issues are the windows that we have to be able to fight regulations, the windows that we have to operate within. We have-- we can only start-- if we can start burning in January, that's awesome. Great. But a lot of times you have snow on the ground, you can't burn that fast. But when the tree act-- Bird Treaty Act goes into effect, we have to shut down. We cannot burn. And then with the 80-20-20 the wind speed, humidity, and humidity regulations that we have to abide by. With the help of Dirac, with some of his research and the success that we've had and the manpower, we feel that we possibly could push that window a little further.

HUGHES: [02:43:44] So just giving you a little more flexibility in the requirements to burn, that's--.

ALLAN MORTENSEN: [02:43:52] That would be a good start. They've talked about they call them the red cards for-- but we feel with the training in the years, the excess that we've had, we feel that we have some in-house training that we do. Nobody gets put on a line that hasn't been there with us and had burned. We don't-- we invite people to come in and help and train with us. But they don't get put in an unsafe environment.

HUGHES: [02:44:29] Okay. Thank you for coming and testifying today.

ALLAN MORTENSEN: [02:44:31] Thank you all.

HUGHES: [02:44:35] Anyone else wishing to testify? No one else? With that, we will close the hearings. I'm sorry, we have letters for the record from Patrick O. Brien, Upper Niobrara White NRD; Roger Suhr, Chadron, Nebraska; Kelsi Wehrman, Pheasants Forever; Mike Murphy, Middle Niobrara NRD; Annette Sudbeck, Lewis&Clark NRD; and Anna Baum, from the Lower Loup NRD. So with that, we will conclude our hearing. Thank you, everybody, for coming on a Friday afternoon. I appreciate it. And very clear this is a timely topic.

SCIENTIFIC REPORT ON EASTERN REDCEDAR INVASIONS:

CAUSES, CONSEQUENCES, AND TECHNICAL GUIDANCE

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KEY BACKGROUND MATERIAL

The amount of tree cover in Nebraska's rangelands has doubled since 2000 and is now approaching one million acres (Fig. 1; Fogarty *dissertation research*). Woody plant invasions are considered to be the dominant threat to rangeland resources by scientists in the Great Plains (Engle et al. 2008; Twidwell et al. 2013a), is listed as the dominant driver of rangeland transitions in the USDA Ecological Site Description Database (reviewed by Twidwell et al. 2013a), and is listed as one of the dominant threats to conservation in Nebraska by the Conservation Roundtable and the Nebraska Invasive Species Advisory Council. Tens of millions of taxpayer dollars are spent in the Great Plains each year in an attempt to manage juniper invasions (including Eastern redcedar) (Twidwell et al. 2013a). Traditional brush management solutions and policy-driven interventions have underperformed relative to management targets, and adaptive policy and management measures are expected to further lag behind Eastern redcedar invasion in the future (Roberts et al. 2018). This report summarizes decades of research to answer some of the most common and relevant questions regarding the causes, consequences, and challenges of Eastern redcedar invasions and its management in Nebraska.

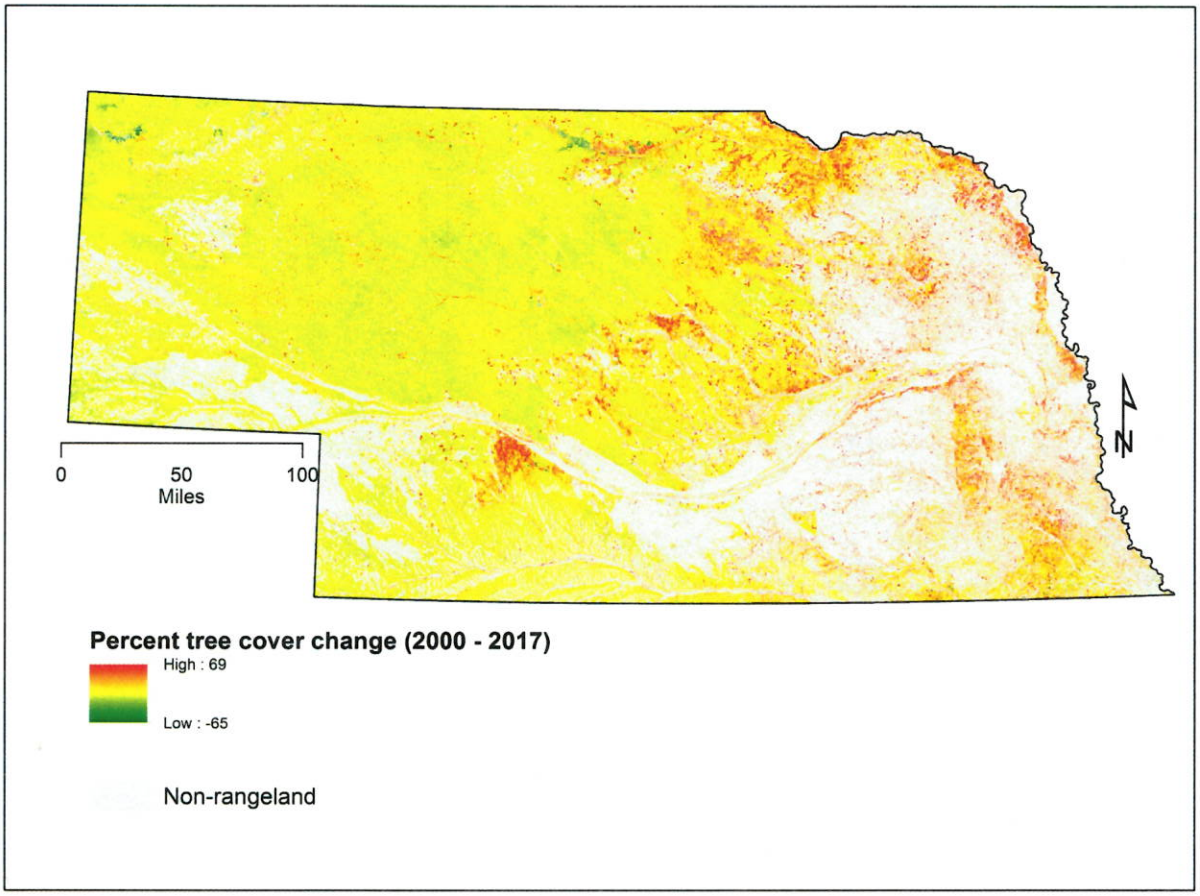


Figure 1. Percent change in tree cover in Nebraska's rangelands since 2000. Observed changes are driven primarily by the invasion of Eastern redcedar (Fogarty *dissertation research*). A larger, high quality image is provided at the end of the report.

I. CAUSES OF EASTERN REDCEDAR INVASION

WHY WAS EASTERN REDCEDAR RARE HISTORICALLY?

Eastern redcedar was historically rare in Nebraska, occurring only where fire could not occur (Miller 1902; Kellogg 1905; Harper 1912; Arend 1950, Blewett 1986; Briggs et al. 2002). This non-resprouting tree is one of the most fire-sensitive plants in the Great Plains (Twidwell et al. 2013b). Consequently, Eastern redcedar was kept in low abundances by frequent human-ignited prairie fires and wildfires and thrived primarily in places where individual trees could escape fire damage (Briggs et al. 2002; Twidwell et al. 2013b).

The removal of this historical controlling process, coupled with ubiquitous planting and distribution of Eastern redcedar, set the stage for widespread invasion and proliferation in grassland-dominated states (e.g. Nebraska; Fig. 1).

WHAT PRACTICES CONTRIBUTE TO THE SPREAD OF EASTERN REDCEDAR?

Today, Nebraska's grasslands are experiencing widespread invasion of Eastern redcedar as a result of the following practices:

- **Human dispersal of tree plantings into new environments**. Eastern redcedar in windbreaks and man-made forest stands distributes seed sources into new habitats and facilitates its invasion into rangelands. Research now conclusively shows Eastern redcedar trees spread from windbreaks in the Nebraska Sandhills (Donovan et al., 2018; Fig. 2), which some scholars previously assumed to be a region that would not be invadable by Eastern redcedar.

Figure 2. Eastern redcedar spread from a windbreak in the Nebraska Sandhills (figure from Donovan et al., 2018).

- **Removal of fires conducted by indigenous groups**. The Great Plains was one of the most frequently burned biomes in the world since the last ice age. Humans were the main

source of fire in the Great Plains for thousands of years to achieve multiple management objectives such as attracting bison and other ungulates for hunting, driving animal herds, clearing land for safer nomadic travel, encouraging early-successional fruits and nuts, farming, and for reducing pest populations (Axelrod, 1985). The tallgrass prairie of the Great Plains ranged from central Canada to the Texas-Mexico border and one-third of it is estimated to have burned every year. Changes in human fire-ignitions in the Great Plains following European settlement removed the top-down control that kept Eastern redcedar rare historically (Fig. 3; Twidwell et al. 2013).

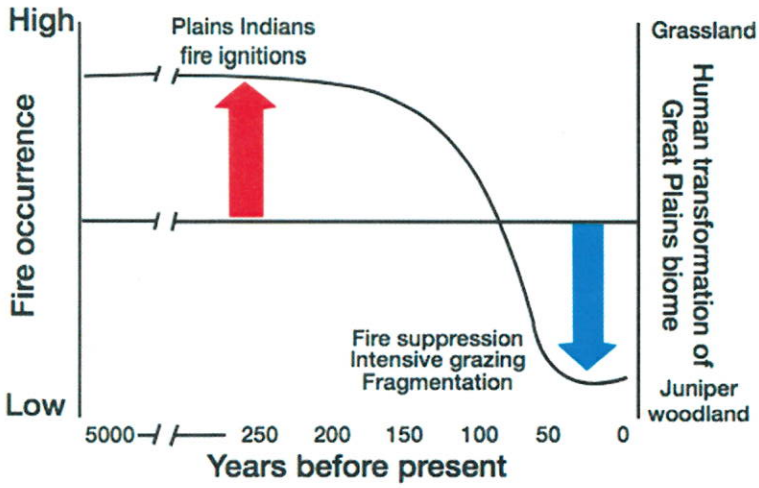


Figure 3. Human-induced fire ignitions shaped the Great Plains biome into one dominated by grassland with scarce Eastern redcedar populations. The removal of Plains Indians fire ignitions and widespread fire suppression has resulted in widespread Eastern redcedar invasion (figure from Twidwell et al. 2013b).

- **Elimination of extreme fire events.** Eastern redcedar is one of the most fire-sensitive plants in the Great Plains. The fireline intensity required for mortality of an individual juniper tree is 160 kJ m^{-1} s^{-1} and varies slightly depending on the height of the tree (Twidwell et al. 2013c). Historically, the rare occurrence of extreme fire events pushed juniper-dominant vegetation toward grassland dominance (Twidwell et al. 2013b; Bielski *Dissertation research*). Today, fire management policies impose caps on the range of fire intensities that are possible in prescribed burning, and models derived from fire physics show policy limits prescribed fires in rangeland to the bottom 25% of potential fire intensities (Twidwell et al. 2016). Cedar trees are therefore able to escape fire damage more often today than occurred previously (Twidwell et al. 2013c). This is referred to as a threshold imposed by modern policy in the disciplines of conservation biology and restoration ecology (*e.g.* Lindenmayer and Luck 2005).

II. CONSEQUENCES OF INVASION

WHAT ARE THE CONSEQUENCES OF EASTERN REDCEDAR INVASION?

Eastern redcedar plantings have occurred for decades in an attempt to enhance the benefits offered by Nebraska's ecosystems (Ganguli et al. 2008). Ecologists now recognize that such enhancements are often short-lived and do not offset the consequences that result from Eastern redcedar invasions in grassland-dominated states. Scientists have studied the consequences of Eastern redcedar invasion on soils since the 1940s (Spurr 1940; Read and Walker 1950), livestock production since 1970s (Owensby et al. 1973; Engle 1985), biodiversity since 1980s (McBain 1983, Smith and Stubbendieck 1990) and now more recently broad social consequences including water yield (Zou et al. 2014, 2015), carbon (Norris et al. 2001; McKinley et al. 2008), wildfire (Twidwell et al. 2013b, Bielski *dissertation research*), and public education funding (Lally et al. 2016). Here, we summarize the most prominent and well-known impacts of Eastern redcedar invasion.

- **Livestock production decreases by 75%.** Aboveground herbaceous production collapses when grasslands convert to closed-canopy cedar woodlands. Studies show a consistent 77% or greater decline, corresponding to an estimated 75% reduction in livestock production (Engle and Stritzke 1992; Briggs et al. 2002; Fuhlendorf et al. 2008).

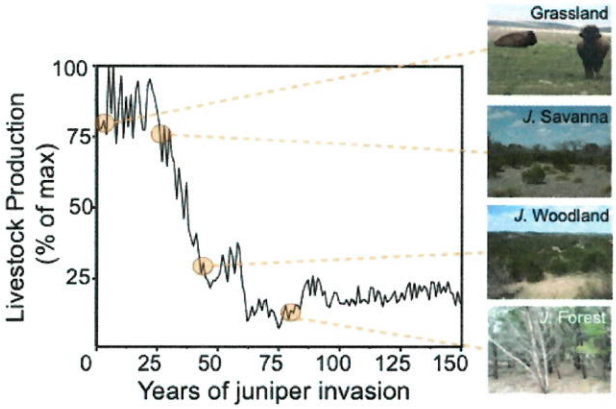


Figure 4. Example of the collapse of livestock production potential as juniper woodland increased over time (data based on Fuhlendorf et al. 2008).

- **Nebraska public schools have lost over $2.4 million due to increased control costs from since 2006.** Increased spending to mechanically removal large, invading trees matches similar trends in spending observed across various government agencies as Eastern redcedar becomes more abundant (Lally et al. 2016).

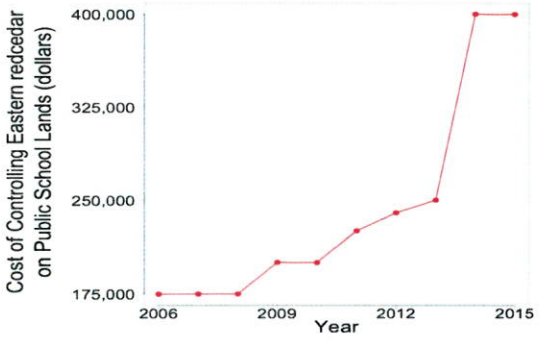


Figure 5. Total amount spent on Eastern redcedar control on School Trust Lands (figure from Lally et al. 2016).

- **Wildfire suppression tactics become ineffective.** Eastern redcedar invasion increases the risk and cost of wildfires (Fig. 6). Flame length is used as a measurement to gauge the

effectiveness of different fire suppression tactics, and new research using pyric sensing technology shows a suppressible fire in grassland becoming insuppressible in closed-canopy cedar woodland. Flame lengths in this research trial (Bielski *dissertation research*) were almost 8 times the length guidelines developed by the U.S. Forest Service identify as suppressible (Andrews and Rothermel 1982).

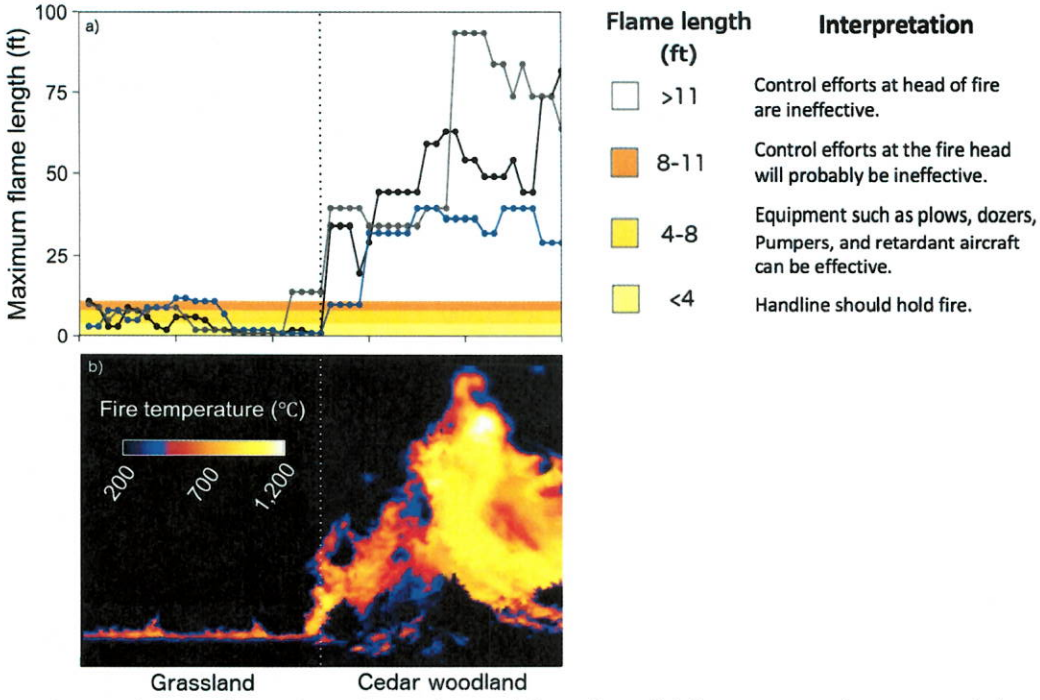
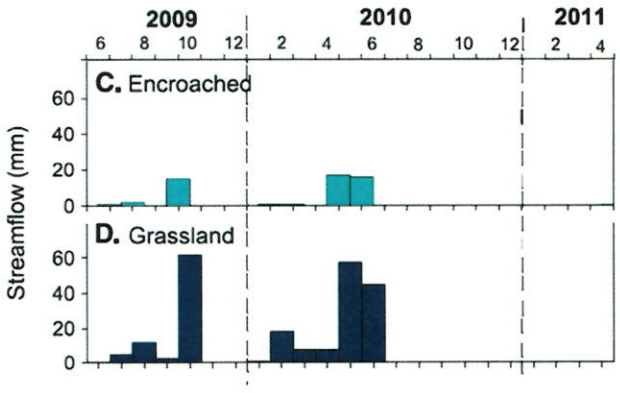


Figure 6. Maximum flame lengths and transitions in wildfire suppression potential as a wildfire moves from a grassland and transitions into a closed-canopy Eastern redcedar woodland. In box (a), each point represents the maximum flame length recorded every 1 ft. along a 45 ft. transect leading to a regime boundary (dotted line). Black lines in box (a) represent individual experimental trials; colored lines in box (a) represent fire suppression threshold guidelines (from Andrews and Rothermel 1982). Pyric sensing technology produced snapshots of fire every 0.5 s with a pixel size of 1 x 1 ft. (box b; figure from Bielski *dissertation research*).

- **Water yield decreases but impacts are uncertain in Nebraska.** Juniper trees (including Eastern redcedar) lose more water to evapotranspiration compared to grassland plants (Dugas et al. 1998; Starks et al. 2014) and studies have shown reductions in streamflow generated by runoff (Zou et al. 2015; Qiao et al. 2017), natural springs (Huang et al. 2006), and groundwater recharge rates (Adane and Gates 2015; Acharya et al. 2017). The impacts to the hyrdrological system in Nebraska are currently being investigated at the University of Nebraska (Mittelstet; Lead PI). One



study in the Nebraska Sandhills showed 3.4-7.5% of precipitation in grasslands was partitioned to recharge the Ogallala Aquifer, while less than 1% of precipitation in cedar woodlands was partitioned for aquifer recharge (Adane and Gates 2015).

Figure 8. Runoff generated streamflow from 2009-2011 for an Eastern redcedar woodland (A) and grassland catchment (B) in central Oklahoma. Figure is from Zou et al. (2014). Numbers on the x-axis (top) correspond to observation years and months.

- **Increased number of endangered and threatened species.** Virtually all grassland-dependent bird, small mammal, insect, and plant species are displaced when grassland converts to closed-canopy cedar woodland (Fig. 8). All wildlife species that are dependent on grassland habitats and occur within the potential range of Eastern redcedar expansion are vulnerable to displacement from redcedar invasion, and research is being conducted to assess the vulnerability to Nebraska's game bird populations (Twidwell, Lead PI). Most grassland bird species are displaced during the early stages of infestation, before cedar cover has reached 25% (Chapman et al. 2004).

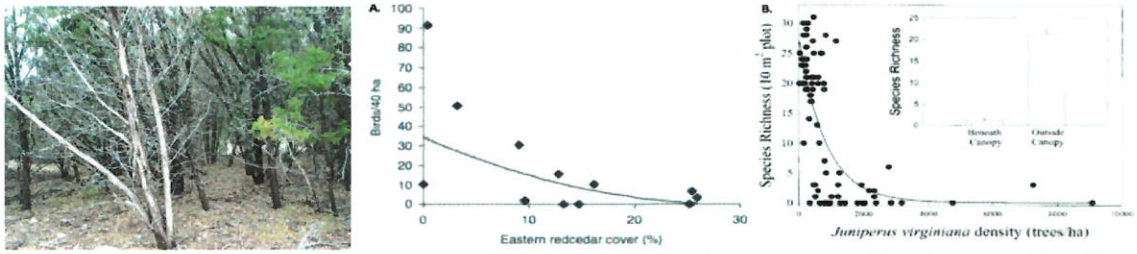


Figure 8. Picture of the understory of a closed-canopy juniper woodland. Virtually all grassland plant species disappear when grassland is converted to closed-canopy juniper woodland. (A) Grassland-dependent bird species abundance declines with increasing Eastern redcedar cover (figure from Chapman et al. 2004). (B) The total number of grassland plant species (species richness) declines 99% in areas converted from grassland to closed-canopy cedar woodland (figure from Briggs et al. 2002).

- **Increased vulnerability to Nebraska's state bird, tree, and flower.** Nebraska's state bird, the grassland-dependent western meadowlark, is not present in closed-canopy cedar woodland (Chapman et al. 2004; Coppedge et al. 2004). Nebraska's state tree, the cottonwood, is also at risk from Eastern redcedar invasion, due to lower regeneration beneath Eastern redcedar woodland understory (Johnson et al. 1976) and Eastern redcedar invasion has already been documented in Nebraska's cottonwood forests (Frost and Powell 2011). The abundance of Nebraska's state flower, the goldenrod, also declines with increasing Eastern redcedar cover (Gehring and Bragg 1992).

WHAT IS THE POTENTIAL ECONOMIC LOSS CAUSED BY THE SPREAD OF EASTERN REDCEDAR?

The scientific impacts of Eastern redcedar invasion have been recently investigated for two sectors of Nebraska's economy. The full economic impacts of Eastern redcedar invasion correspond to a diverse suite of potential social and environmental sectors and has yet to be explored in scientific research.

- **Nebraska is at the early stages of Eastern redcedar invasion in Nebraska, but has lost nearly half a million acres of grazing land since 2000 with an estimated economic impact of $18.7 million.** Economic losses in grazing lands have consistently been shown to correspond to a 75% reduction to livestock stocking rates on rangelands that transition to Eastern redcedar woodland (Fuhlendorf et al. 2008). Based on cash rental rates in Nebraska's districts (Jansen et al. 2018) and ongoing research on the potential distribution of Eastern redcedar woodland in Nebraska (Fogarty *dissertation research*), a first approximation of the economic risk to Nebraska's grazable lands is $360 million per year (Twidwell et al. *to be submitted for scientific peer-review*). These results should be considered preliminary findings.

- **Nebraska public schools have lost over $2.4 million** in potential revenue from 2006-2016 to increase cedar management control efforts (Lally et al. 2016). As cedars continue to expand in Nebraska, the School Land Trust has initiated a campaign to protect grazing revenue and halt cedar invasions onto Trust lands. The Trust first established programs to control cedar in the 1980s. That campaign has been stepped up in the last ten years. The School Land Trust has increased annual expenditures for cedar control by $250,000 since 2006. The scientific consensus is that such control measures are necessary to prevent economic collapses in grazing revenue long-term. Losses in profitability are impacted by decisions made on neighboring lands; increasing investments become required for management to stay ahead of the increased seed sources in the surrounding landscape.

- **Additional economic costs expected to vary across Nebraska.** Decreases in water yield, wildfire regulation, and an increase in the number of threatened and endangered species will result in economic losses. However, interactions between Eastern redcedar invasion will be different across regions and no economic research has been conducted in this area.

HOW WILL GRASSLAND-DEPENDENT WILDLIFE AND CRITICAL HABITAT BE AFFECTED?

Impacts to grassland wildlife and critical habitat have been studied by scientists more than any other sector. Here, we summarize key points from decades of research findings quantifying loss of grassland wildlife and critical habitat resulting from redcedar invasion.

Species-level impacts

- Eastern redcedar invasion is one of the primary drivers of declining **grassland bird** populations in the Great Plains (Coppedge et al. 2001). Grassland bird abundance and diversity decline when juniper cover exceeds just 10% (Grzybowski et al. 1994; Fuhlendorf et al. 2002; Chapman et al. 2004; Engle et al. 2008). For example, **greater prairie-chickens** avoid forming leks close to forested habitat (Merrill et al. 1999), **lesser prairie chickens** are 40 times more likely to use tree-less habitats compared to habitats with 5 trees per hectare (Lautenbach et al. 2017), and **grasshopper sparrows** are most abundant when Eastern redcedar cover is less than 10% and become displaced when cover exceeds 25%-35% cover (Chapman et al. 2004).

- The total number of **grassland plant** species declines up to 88% in areas converted from grassland to closed-canopy cedar woodland (Briggs et al. 2002; Limb et al. 2010, 2014).

- **The federally endangered American Burying beetle** was captured in cedar woodland sites 25% less than in grassland sites (Walker and Hoback 2007).

- The majority of **small mammal** species decline when Eastern redcedar cover exceeds 30% in grasslands (Horncastle et al. 2005; Matlack et al. 2008; Reddin and Krementz 2016). When Eastern redcedar cover exceeds 30%, the small mammal community is typically dominated by a single species, the white-footed mouse (Horncastle et al. 2005).

Critical habitat impacts

- **Eastern redcedar is increasing in Nebraska's Biologically Unique Landscapes (BULs).** Eastern redcedar is invading Nebraska's BULs, threatening common and at-risk grassland wildlife (Fig 9; Fogarty *dissertation research*). For most rangeland BULs, Eastern redcedar invasion has reached stages that are expensive to manage mechanically, and invasion continues to outpace control. Preventing the establishment of Eastern redcedar, and managing invasion during the early stages (i.e., when trees are not detectable with satellite imagery) is a recommended strategy for managing tree invasions across the world's grassland regions (Beale et al. 2013).

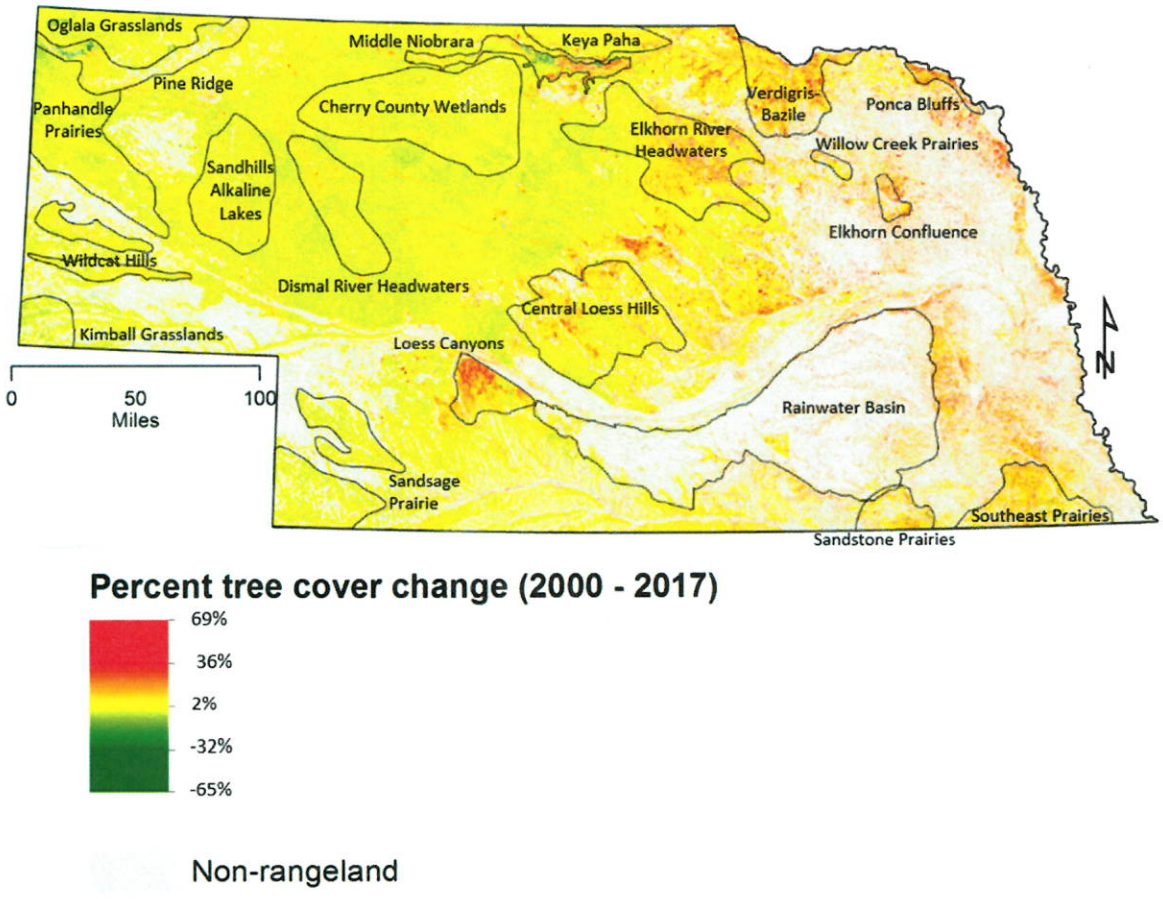


Figure 9. Percent tree cover change from 2000 - 2017 in Nebraska's rangeland Biologically Unique Landscapes (Fogarty *dissertation research*).

- **Only one group in the Great Plains has demonstrated the capacity to stabilize a region following the onset of exponential growth of Eastern redcedar (Fig. 10; Fogarty *dissertation research*).** This is the result of unique partnership in the Loess Canyons BUL where landowners, scientists, and agencies (Nebraska Game and Parks

Commission, Pheasants Forever, Natural Resource Conservation Service) have leveraged resources in new ways to scale-up Eastern redcedar control, and this region provides the first scientific evidence for sustainable rangeland management in areas with higher amounts of juniper cover in the Great Plains. Other regions in Nebraska that have received significant conservation investments for Eastern redcedar control continue to increase (Fig. 10).

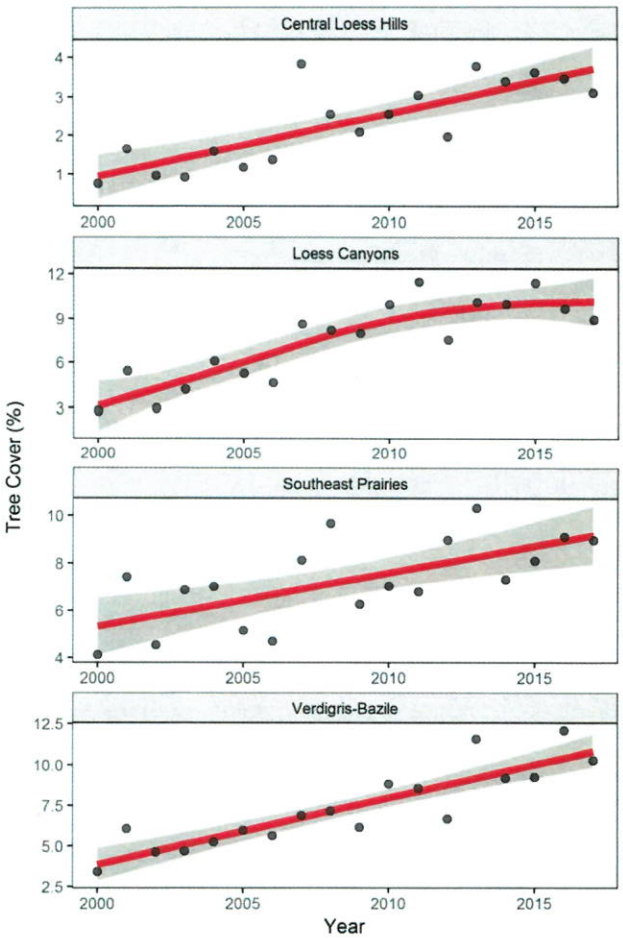


Figure 10. New rangeland inventory shows the relative performance of Eastern redcedar conservation expenditures in four Nebraska BULS that have received significant cost-share investments.

- **Grassland-dependent game species are expected to decline with large-scale transitions to cedar woodland.** The presence, abundance, and/or nest success of game species including greater prairie chickens, lesser prairie chickens, bobwhite quail, and pheasant are negatively impacted by grassland transitions to Eastern redcedar dominance (Bakker 2003; Fuhlendorf et al. 2002; Crosby et al. 2013).

- **Eastern redcedar invasion limits the influence of other habitat management strategies for grassland wildlife.** Eastern redcedar invasion eliminates habitat for grassland-dependent wildlife and will limit the efficacy of numerous grassland-based conservation programs. Habitat management strategies such as conservation grazing, establishment of food plots, and wildflower planting will have limited, if any, impact on grassland wildlife abundance if Eastern redcedar invasion is not controlled.

Figure 10. The results of Eastern redcedar invasion in Loess Canyon rangelands of Nebraska (photo taken near Curtis, NE by Christine Bielski).

III. SCIENTIFICALLY-DERIVED TECHNICAL GUIDANCE

WHAT SCIENTIFIC PRINCIPLES SHOULD BE CONSIDERED WHEN USING CEDAR IN WINDBREAKS?

Cedar was identified as a solution for managing wind under the assumption that, as a native species, it would not spread into surrounding grassland landscapes. However, a suite of environmental and societal damages to grassland regions have now been widely documented (see *Consequences section*). Given what is now known following decades of research, the following scientific principles have been proposed to guide decision-making:

- **Do not plant where the consequences to society outweigh the benefits (Roberts et al. 2018).** The greatest risk of invasion from planting are in areas where Eastern redcedar is currently absent or rare and people are dependent on grassland resources. The potential benefits versus tradeoffs should also be considered as part of a broader risk assessment to other urban and non-urban environments.

- **Agencies should publicly declare when the benefits are perceived to outweigh the consequences, and the consensus of scientific evidence should be used to justify their reasoning.** This practice follows standards used to guide agency decision-making and stakeholder engagement for other species that pose high risks to economic, social, and ecological integrity and human well-being. Tradeoffs between benefits and consequences should be closely examined and scrutinized.

- **Existing stands should be candidates for removal in regions where the potential damages far outweigh the potential benefits.** Tradeoffs between the benefits of plantings and the consequences of invasions should be re-evaluated over time, as these relationships are expected to change over time.

- **State and federal funds should not be used to plant Eastern redcedar trees in regions where funds are also used to remove spreading trees.** This dichotomous approach has been tried often but has not been successful long-term at avoiding social-ecological damages on large landscapes or regional scales (Roberts et al. 2018).

- **Transition to an alternative windbreak solution.**

DO PERCEPTIONS OF PRESCRIBED FIRE RISKS MATCH REALITY?

- **A study by Twidwell et al. (2015) counters an often-used justification that alternative brush management techniques, such as mechanical (machine-related) equipment, are less risky to personal fatality or injury than prescribed fire – and therefore should be prioritized in management over prescribed fire.** Vehicles and heavy machinery are consistently leading reasons for fatalities within occupations that serve as proxies for the types of management techniques employed by ranchers and agricultural producers (Fig. 11), and mechanical equipment also constitutes a large proportion of fatalities among firefighters.

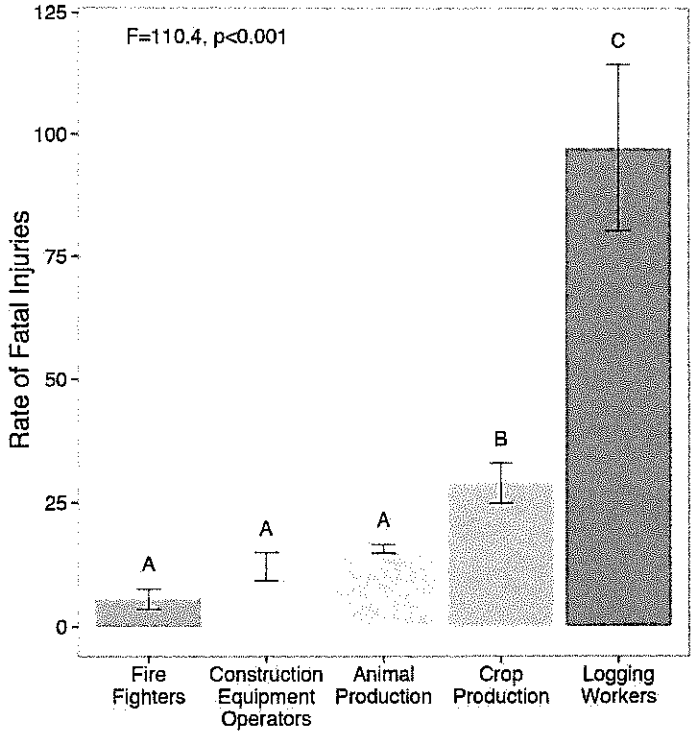


Figure 11. Relative risk of different management techniques used by private land managers, based on occupational fatality rates as proxies. The fatality rate represents the number of fatal occupational injuries per 100,000 full-time equivalent workers. Data from the US Bureau of Labor Statistics 2014 Census of Fatal Occupational Injuries, 2006-2013.

- **Fatality risks associated with prescribed fires are substantially lower compared to risks associated with fighting wildfires (Fig. 12; from Twidwell et al. 2015).** Policy decisions over prescribed fire, when based on wildfire-driven perceptions of risks of fatality, are highly erroneous.

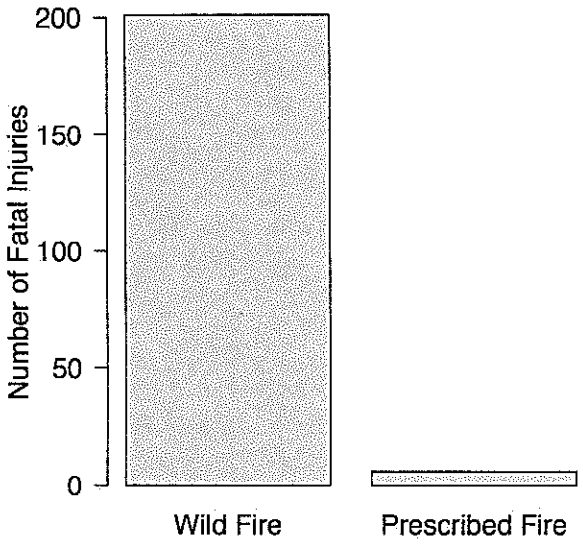


Figure 12. Number of fatal injuries related to wildfire and prescribed fire from 1963–2013 reported in the National Interagency Fire Center 2014 Wildland Fire Fatalities by Type of Accident.

- **A recent survey showed 99% of prescribed fires conducted by landowner prescribed burn associations are implemented without incident, which mirrors the safety record for federal agencies.** Landowner prescribed burn cooperatives undergo their own self-governed training and experience process that differs from federal agencies. A summary of their recent activity and safety record was published in Weir et al. (2015).

- **One of the most common agency biases in fire management is to favor reduction of short-term risks over long-term risks (reported in Calkin et al. 2013), and this has weakened regional capacity to manage wildland fuels.** This tendency is evident in decisions against using or adequately supporting prescribed fire, because of perceptions of short-term risks, and has instead been directly connected to the long-term build-up of volatile fuels and a growing trend toward larger and more severe wildfires.

HOW DO LEGAL LIABILITY STANDARDS INHIBIT PRESCRIBED BURNING?

- **Several states in the United States have undertaken prescribed burn statutory reform, following increased recognition of the importance of prescribed fire for ecosystem management and the constraints current statutory schemes impose on its use.** The stated purpose of these statutory reforms, often called "Right to Burn" or "Prescribed Burning" acts, is to encourage prescribed burning for resource protection, public safety, and land management. Wonkka et al. (2015) assessed the consequences of

prescribed burn statutory reforms on the amount of prescribed burning conducted in a state, comparing landowner prescribed fire use in contiguous counties with different regulations and legal liability standards. Private landowners in counties with gross negligence liability standards (requiring a finding of wanton and reckless behavior in order to assign liability) burn significantly more land area than those in counties with simple negligence standards (requiring only a breach of the duty to show reasonable care in the application of fire).

WHAT ARE CHALLENGES TO EFFECTIVE EASTERN REDCEDAR MANAGEMENT?

- **Not enough land is being managed to deal with the amount of area being invaded and converted.** The scale of current management 'solutions' do not match the current scale of Eastern redcedar invasion (Bielski *dissertation research*). Multiple regions of the state are transitioning (Fig. 1, Fig. 9), showing that current management practices are unsustainable and the need for large-scale adaptation. New solutions should be explored and developed that are capable of addressing the current scale and rate of invasion.

- **Unifying policies across natural resource agencies will increase the likelihood of successfully managing Eastern redcedar invasion.** Eastern redcedar management policies differ widely among natural resource agencies in Nebraska. Some encourage planting Eastern redcedar, some consider it an invasive species, and others manage it as a desirable species and an invasive species at the same time (Roberts et al. 2018).

- **Opportunities exist for cost-effective preventative management, but current policies do not align with a preventative approach.** Eastern redcedar is spreading from windbreaks at slower rates in Nebraska's western regions compared to eastern regions (Fogarty *dissertation research*). Management of Eastern redcedar is most cost effective in areas with slower rates of invasion because grassland resources are still intact and rapid detection and response is the most cost effective approach to managing cedar spread (Roberts et al. 2018). **As a result, the norm is for land managers and agencies to under-investments at low levels of infestation and over-investments after damages are realized.**

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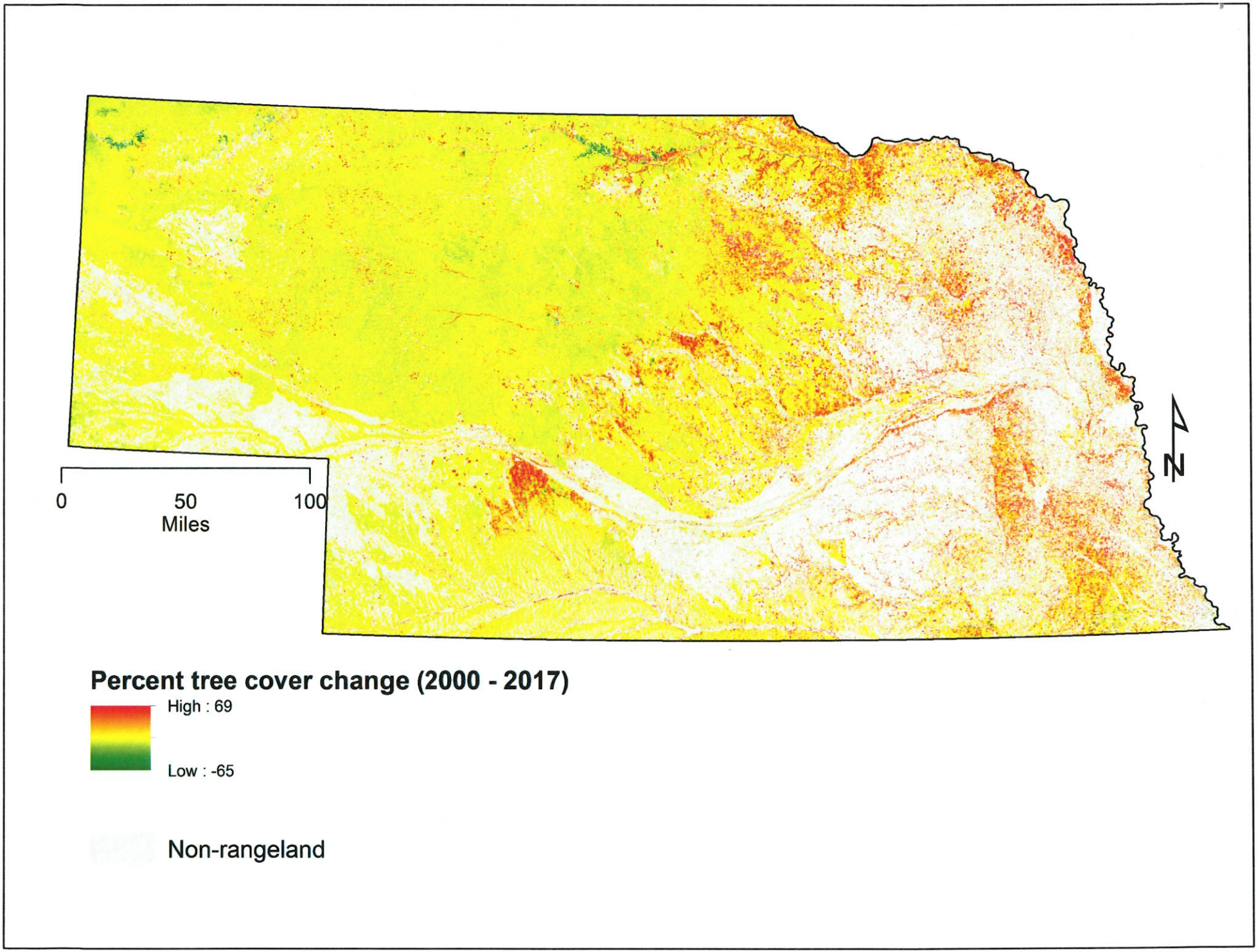

0
50
Miles
100
N
Percent tree cover change (2000 - 2017)
High : 69
Low : -65
Non-rangeland

NEBRASKA CONSERVATION ROUNDTABLE

Conservation Roundtable Testimony

The Nebraska Conservation Roundtable consists of 24 organizations and agencies with the shared mission to improve the Nebraska's conservation community through the development of a more cohesive voice for conservation, create dialogue and foster collaboration, serve as a resource for policy makers and recommend science-based, sustainable solutions for complex conservation issues impacting Nebraska's natural resources, fish and wildlife habitat.

The Conservation Roundtable works on common, shared issues and acknowledges member organizations and agencies independence, thus allowing each entity to determine if they will sign onto any documents or recommendations developed by the roundtable.

The Conservation Roundtable has prioritized seven key issues facing Nebraska's wildlife and natural resources, one being eastern redcedar encroachment. A white paper was produced by a subcommittee with expertise on the issue, reviewed by the full roundtable, and has the signed support of 20 Roundtable members, which is being submitted as written testimony.

Cedar, a tough and hardy native tree species, is rapidly expanding across much of the state, in part due to its adaptability to a wide range of conditions, the lack of fire on the landscape (both prescribed fire and wildfire), changes in farm and grazing practices, drought, lack of grassland and forest management, changes in land ownership patterns, and conservation plantings as a seed source. Cedar has expanded more than any other species across much of the Midwest and Great Plains.

Many Nebraskan's don't perceive redcedar encroachment as a significant threat until trees have overtaken an area and become too dangerous or expensive to remove. Now is the time for proactive cedar removal and management while it can still be addressed.

The rapid expansion of cedar trees is a concern because:

- Among the 4 major groups of birds, grassland birds have recently experienced the steepest declines. Studies show that grassland bird populations decline rapidly when cedar cover reaches only *10% in a grassland* so as cedars spread into Nebraska's prairies and grasslands we will see continued bird declines (Chapman et al. 2004).
- Cedar expansion is a problem for Nebraska's livestock economy. Cedar expansion reduces livestock production by 75% when grasslands are overrun by cedar trees (Fuhlendorf et al. 2008).
- Cedar spread is on the cusp of being beyond Nebraskan's ability to control. Many landowners fail to recognize small cedars as a threat, and current landcover analyses don't necessarily

capture all the grasslands with very small cedars that within 10 years will be substantially more expensive and potentially dangerous to remove. Currently, it is estimated that it costs landowners and conservation organizations $15 million annually to just maintain existing grassland. This is assuming that 25,000 acres will need to be cleared annually. If the invasion in forests is included with grasslands, where removal is often more costly, it would cost $23 million every year to mechanically clear 38,000 acres of cedar forest just to stay even with the expansion that was observed in 2005-2010 (See Roundtable White Paper, July 2016)

- Neighboring states have large tracts of land turn from grasslands to forest. Oklahoma is currently losing 100 square miles annually to cedar expansion. Nebraska is in a position now to learn from other states and take action.
- As cedars become denser, there is an increased threat of wildfires which is a threat to homeowners and agriculture. For example, in 2016 in Kansas, the Anderson Creek Fire burned 313,000 acres and killed 750 cattle and destroyed at least 11 homes and 2,700 miles of fence. County official estimated the fire caused at least $30 million in total damage and that $1.5 million was spent on suppression efforts. In 2017 at the border of Kansas and Oklahoma, the Starbuck Fire burned 509,000 acres, killed one person and at least 4,000 cattle and destroyed 26 homes. Officials estimate the fire caused $50 million in total damage and cost at least $700,000 to suppress (Kansas Legislative Post Audit Report).

The Nebraska Conservation Roundtable recognizes that many individual landowners, agencies and organizations are invested in controlling, managing and reducing eastern red cedar.

- However current efforts are not sustainable.

Actions needed to combat eastern red cedar expansion include:

- Expand control and reduction methods such as mechanical tree removal and prescribed burns. By using cost-share and technical assistance programs, conservation entities have demonstrated that landowners will continue to manage cedars into the future.
- Identify priority geographic areas for action. There may be areas of Nebraska where it is simply not feasible to reduce the cedar forest.
- Identify alternative species for windbreaks and educate landowners about those alternatives.
- Conduct targeted research to develop non-seed bearing cedar trees.
- Educate Nebraskans that redcedar encroachment is a problem and conduct extensive education and outreach activities so more landowners are aware of the responsibility that they will have to maintain cedar plantings and that it may negatively impact their neighbors.
- Explore development opportunities to promote economic incentives and driver for cedar removal, processing and management. This may include but is not limited to finding alternative uses for removed cedar wood.

For the statistics provided in this testimony are organized by impact on UNL's Eastern Redcedar Literacy Project at: https://agronomy.unl.edu/eastern-redcedar-science-literacy-project

Specific References mentioned:

Chapman, R. N., Engle, D. M., Masters, R. E., and Leslie Jr, D. M. (2004). Tree invasion constrains the influence of herbaceous structure in grassland bird habitats. Ecoscience, 11(1), 55-63.

Fuhlendorf SD, Archer SR , Smeins FE , et al. (2008). The combined influence of grazing, fire, and herbaceous productivity on tree–grass interactions. In: Van Auken OW (Ed). Western North American Juniperus communities: a dynamic vegetation type. New York, NY: Springer-Verlag.

Kansas Legislative Audit Report:
http://www.kansasforests.org/fire_management/fire_docs/Final_Report.pdf

NEBRASKA CONSERVATION ROUNDTABLE

The Conservation Roundtable helps Nebraska's conservation community become a more cohesive voice for conservation, create dialogue and foster collaboration, serve as a resource for policy makers and provide science-based, sustainable solutions for complex conservation issues impacting Nebraska's fish and wildlife habitat.

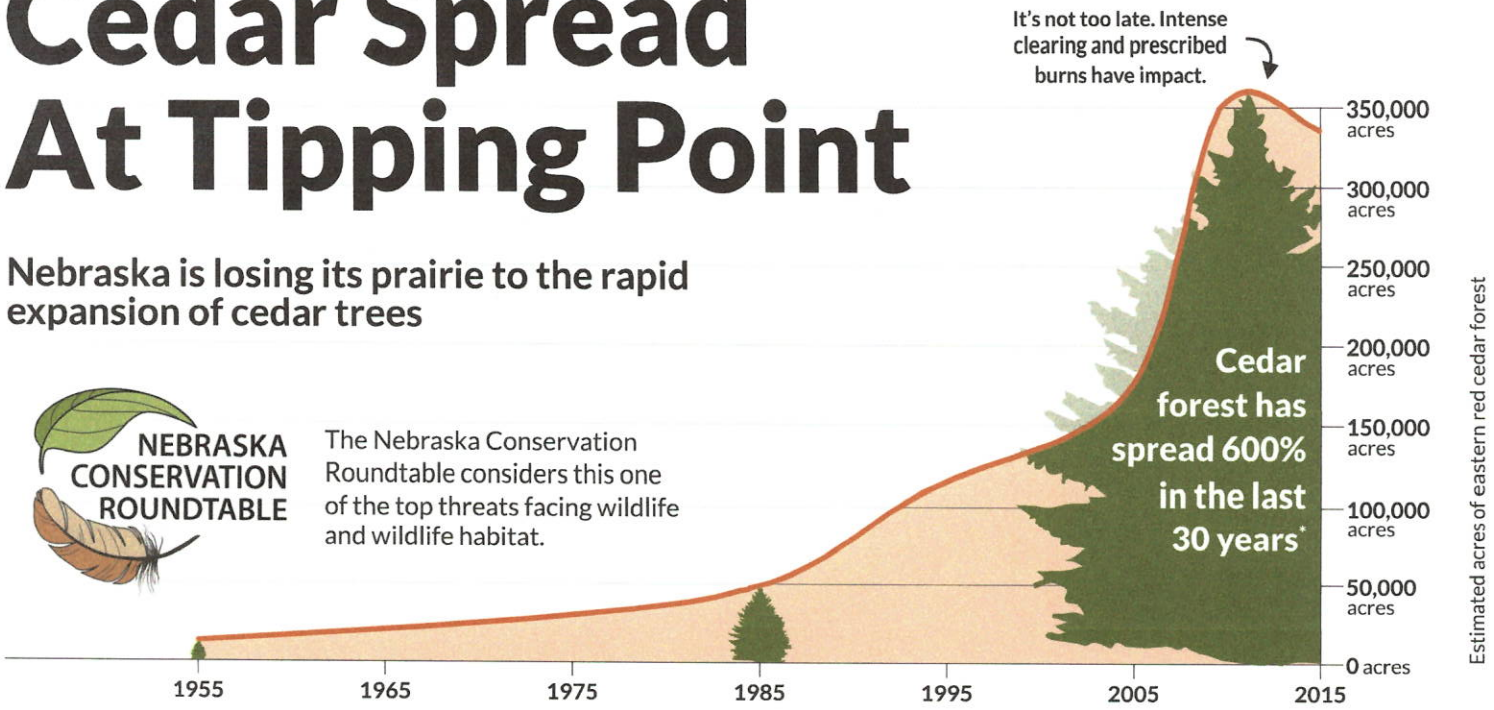
Big Game Conservation Association
Ducks Unlimited
Friends of the Niobrara River
National Wild Turkey Federation
Natural Resources Conservation Service
Nebraska Audubon
Nebraska Big Game Society
Nebraska Cooperative Fish and Wildlife Research Unit
Nebraska Forest Service
Nebraska Game and Parks Commission
Nebraska Land Trust
Nebraska League of Conservation Voters
Nebraska Ornithologists Union
Nebraska Sierra Club
Nebraska Sportsmen Foundation
Nebraska Wildlife Federation
Pheasants Forever
Playa Lakes Joint Venture
Rainwater Basin Joint Venture
The Crane Trust
The Nature Conservancy
The Sandhills Task Force
The US Fish and Wildlife Service
The US Forest Service

Nebraska's most pressing issues facing wildlife and natural resources:

Eastern redcedar encroachment
Degraded water and wetland resources
Grassland conversion
Inappropriately sited energy development
Climate change
Reduced state funding for conservation
Invasive species and disease

Cedar Spread At Tipping Point

Nebraska is losing its prairie to the rapid expansion of cedar trees



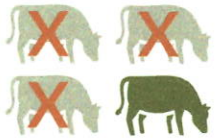
NEBRASKA CONSERVATION ROUNDTABLE

The Nebraska Conservation Roundtable considers this one of the top threats facing wildlife and wildlife habitat.

How cedar spread is costing Nebraska:

$15 million every year will be needed just to maintain current grassland levels by clearing 25,000 acres in the state.

Neighboring states have lost thousands of rangeland acres to cedar encroachment. Oklahoma is losing **100 square miles annually** to cedar expansion.



Livestock production decreases by 75% when grasslands are overrun by cedar trees.

Since 2006, Nebraska schools have spent $2.4 million fighting cedar invasion.

Wildfire risk increases in areas of dense cedar cover, threatening homeowners.

Grassland bird populations decline rapidly when cedar cover reaches 10%.

Stream flow is reduced by 1/3 in areas of cedar encroachment compared to grasslands.

How we can solve this:

Expand cedar removal, including mechanical means, cost-share, economic incentives, prescribed fire, and technical assistance programs.

Educate landowners and the general public about the risks of cedar spread, cedar management, and the programs available to help them remove cedar trees on their land.

Establish priority areas of immediate threat where the cedar spread is most severe but still reversible.

Explore development of opportunities to promote economic incentives and drivers for cedar removal, processing and management.

*Approximately

Sources: UNL Eastern Redcedar Science Literacy Project, https://agronomy.unl.edu/eastern-redcedar-science-literacy-project/impacts
US Forest Service FIA 2016

Eastern Redcedar in Nebraska: Problems and Opportunities

Nebraska Conservation Roundtable Issue Paper No. 1
July 1, 2016

Introduction

Eastern redcedar, Juniperus virginiana, (cedar) is a native tree that has always been a fixture on the Nebraska landscape, providing valuable wood products, wind and soil protection, and habitat for a variety of species of wildlife. However, the rapid spread of cedar is an increasingly serious ecological and economic issue with substantial impacts statewide. Addressing the spread of cedar poses challenges of a magnitude that dwarfs the capacity and resources of any one agency or organization. Taking a collaborative approach, in 2013 the members of the Nebraska Conservation Roundtable came together to develop a vision for addressing the rapidly expanding population of cedar in Nebraska, define the extent of the problems, determine the opportunities cedar presents, and identify specific actions to achieve this vision.

Our Vision: Roundtable partners envision a future where:

- grasslands and pastures are managed in ways that reduce cedar populations to improve grass health, vigor and resilience, enhance and conserve native wildlife habitat in grasslands, and protect species diversity at the landscape scale;
- forests containing cedar are managed to enhance timber quality and economic value of all species, increase plant and wildlife diversity within forests, enhance forest ecological resilience and function, and reduce the risk of catastrophic wildfire; and
- cedar is a valuable tree species on the Nebraska landscape, with multiple and profitable markets for its wood, contributing to landowner income, job creation and economic development.

Eastern Redcedar: Problem and Opportunity

Historic and Current Rates of Spread: Cedar, a tough and hardy native tree species, is rapidly expanding across much of the state, in part due to its adaptability to a wide range of conditions, the lack of fire on the landscape (both prescribed fire and wildfire), changes in farm and grazing practices, drought, lack of grassland and forest management, changes in land ownership patterns, and conservation plantings as a seed source. Cedar has expanded more than any other species across much of the Midwest and Great Plains (Figure 1), with Nebraska experiencing the greatest forest density of cedar trees/acre of any other Midwestern state (Figure 2) (USFS FIA 2016), and until 2012, a near exponential rate of spread in Nebraska (Figure 3). The spread of cedar in Nebraska is especially significant from west-central to eastern NE (Figure 4).

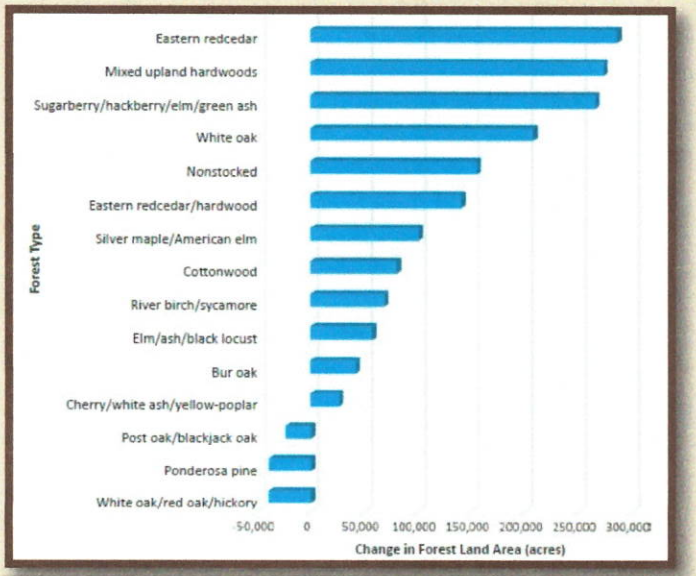


Figure 1. Forest expansion the central US by species state, 2005-2012

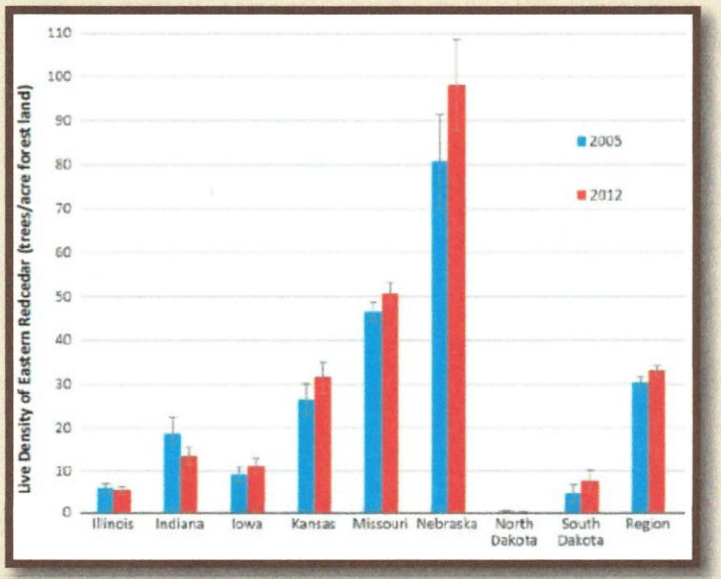


Figure 2. Changes in cedar forest density by state, 2005-2012

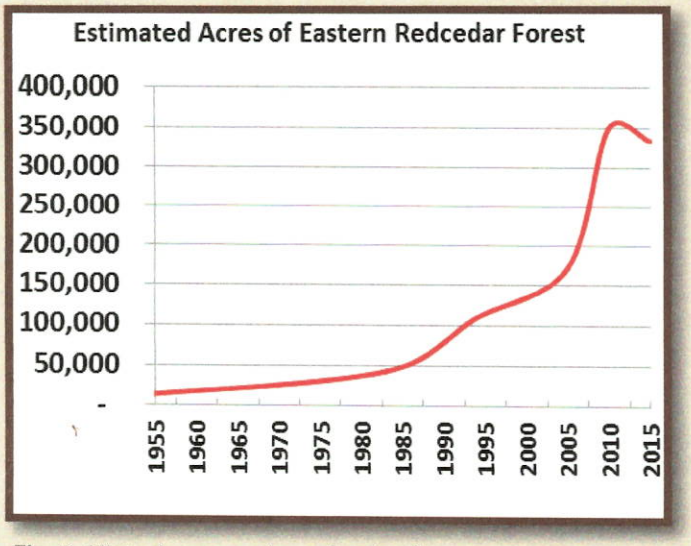


Fig. 3. Historic expansion of cedar forest acres

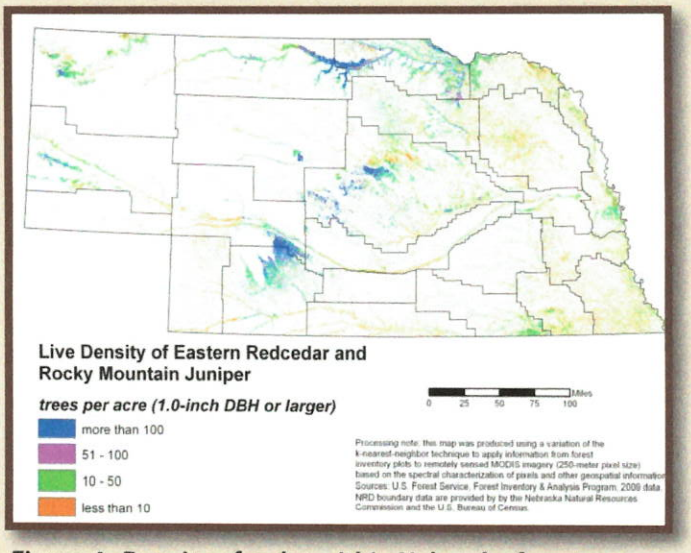


Figure 4. Density of cedar within Nebraska forests (2009 data)

Early spread of cedar into grasslands.

Heavy cedar growth in grassland

Large-scale cedar forest establishment in grasslands, Loess Canyons, NE

Cedar encroachment under pine forest, Niobrara Valley.

Estimated at 333,134 forested acres in 2015, cedar now constitutes 22% of Nebraska's forest area . Average annual rates of spread from 2005 to 2010 were approximately 25,000 acres/year of new cedar forest occurring in former grasslands, and 13,000 acres/year of existing forest being converted to a cedar forest type (Figures 1 & 2). However, this rate of spread has slowed since 2009. Data from 2013-2015 indicates that cedar forest decreased by 30,000 acres as a result of mechanical removal and/or prescribed burning of former (reclassified) grasslands as well as mechanical cedar removal from under forests.

It is important to note that cedar occurring at low densities and as very small trees in grasslands are not included in these data, as they do not meet the criteria to be classified as forest. Once these trees grow to the size of having a stem diameter >1" at 4.5' above ground level and a stocking level of at least 10%, the area is then classified as cedar forest and is included in forest inventory findings. Unfortunately, once new areas of cedar reach this size and density, with much higher fuel loads, their management has already become more complex and expensive.

USFS FIA Inventories of tree seedlings (trees <1" in diameter at 4.5' above ground level) estimate that cedar seedlings are the second largest seedling population in Nebraska's forests, with one of the fastest rates of population increase (Figure 3). Between 2005 and 2015, the number of cedar seedlings in forests doubled to nearly 275 million . While there are no inventory data available that measure encroachment of grassland by cedar, there are anecdotal observations that note the existence of large numbers of small seedlings in grasslands across central and eastern NE. Combined, these trends imply that there exists an enormous pool of seedlings that will eventually convert large areas of existing pine and deciduous forests and grasslands to cedar. The large number of seedlings in grasslands implies that an important window of opportunity may currently exist for the expanded use of prescribed fire to reduce these numbers while the trees are still small. When these seedlings in grasslands grow larger and increase in numbers, substantially increased fuel loads will complicate the use of prescribed fire.

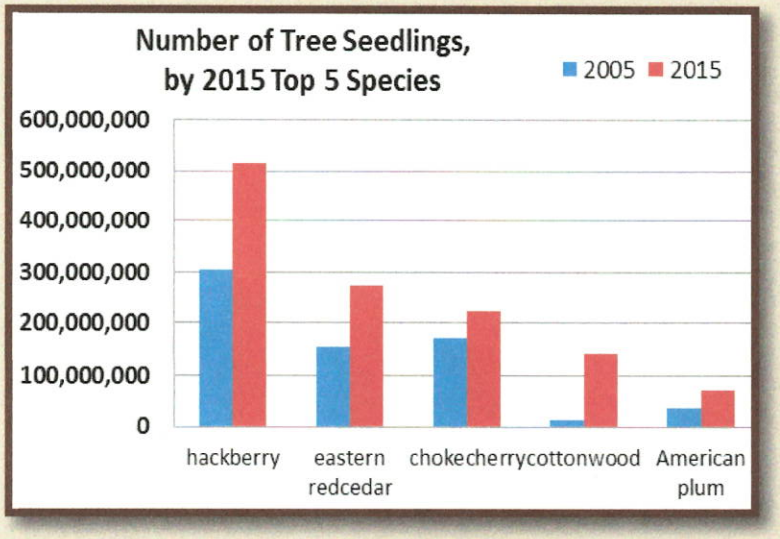


Fig. 5. Number of Seedlings (<1" diam.)

[1] Forest land is defined by the US Forest Service Forest Inventory Analysis Program as land that is at least 10 percent stocked by trees >1' in diameter, be at least 1 acre in size, at least 120 feet wide.
[2] Stocking is the percentage of the optimal # of trees in a stand.
[3] US Forest Service Forest Inventory and Analysis program, 2015 data.

Negative Ecological and Economic Impacts

The spread of cedar into forests and grasslands has a number of negative impacts:

- Loss of native grassland habitat for grassland nesting birds and other wildlife species associated with grasslands.
- Reduced grazing land productivity due to reduced grass health, availability, vigor and species diversity.
- Increased risk of catastrophic loss of life and property and large economic losses due to uncharacteristic wildfire [e.g., suppression costs, loss of physical infrastructure, human health impacts (fire, smoke), damage to soils, flooding, reduced air quality]
- Altered forest structure and function of existing deciduous and pine forest communities.
- Reduced biological diversity in both grasslands and forests, with potentially negative impacts to sensitive species and/or Threatened or Endangered(T&E) species
- Loss or degradation of native riparian forest communities (e.g. cottonwood gallery forests) important to many wildlife species, game and non-game, and sensitive species such as bald eagles.
- Reduced water availability due to increased water use and interception by cedar as compared to upland grasses and forbs.
- Changes in stream channel morphology and altered natural hydrology.
- High costs to landowners for cedar removal and disposal using mechanical methods followed by prescribed fire.

The Dilemma

Cedar is severely impacting our grassland, forest, water and wildlife resources on a very large scale. It is expensive to mechanically clear cedar that has encroached into grasslands or under existing forests. Using prescribed fire, grasslands are best managed with low populations of cedar of small size. Grasslands with heavy cedar fuel loads and large trees can be challenging to burn safely, and remaining cedar skeletons still need to be mechanically removed post-fire. Forests (especially ponderosa pine forests) with cedar in the understory often cannot be safely burned at all until the cedar understory is mechanically removed. Current average costs for mechanical removal range from $120/acre to $1,000/acre depending on tree density, size, plant community, soil type and topography. At an average cost of $600/acre, it would cost nearly $23 million/year to mechanically clear 38,000 acres of cedar forest annually just to stay even with expansion that was observed during 2005-2010. Hundreds of millions of dollars would be needed to manage 333,000 acres of existing cedar forest. Mechanical removal should also be followed by prescribed fire to eliminate small seedlings and seed. While prescribed fire should play an important and cost-effective role in cedar management, topography, fuel loads, limited safe burning weather windows and liability can all limit its overall use on a large scale. While subsidy programs can have significant impacts, securing $23 million/year or more for cedar clearance programs is not likely to be realistic, and may not be the best use for scarce funds.

Given limited financial resources and other barriers, a multifaceted approach to manage cedar is urgently needed to expand mechanical removal and prescribed fire programs, and to develop new and novel market-driven utilization approaches. Creating economic markets for cedar wood and other materials would promote and financially support its removal for various products, while at the same time promote conservation of important wildlife habitat such as native grasslands and cottonwood riparian forests.

Opportunities: Positive Benefits of a Growing Renewable Wood Resource

Nebraska's cedar trees (1" diameter or larger) currently contain more than 8.9 million tons of wood . Approximately 50% of this biomass is contained in trees <9" in diameter. As these existing trees grow, cedar wood volume will rapidly increase, substantially augmented by the addition of millions of new trees in coming years.

Establishing markets for cedar wood would create a number of benefits, including:

- Establish a sustainable economic driver for cedar management that simultaneously achieves economic, conservation and restoration goals.
- Generate income from salable, value-added products for multiple markets such as timber products, bioenergy, mulch, animal bedding, biochar, chemicals, specialty products, etc. Cedar lumber is the one of the most valuable woods produced in Nebraska, second only to walnut.
- Cedar-based businesses would foster local economic development, job creation and reduced energy costs.
- Increase productivity of grazing lands, with increased rancher income.
- Reduced GHG emissions from facilities shifting from fossil fuels to cedar biomass.
- Increased burning of cedar in boilers instead of in open slash piles, reducing GHG emissions (including methane) by 50%.

[4] Cedar populations in grasslands that have not yet reached the minimum numbers and density to qualify as forest are not tracked by any agency or organization in Nebraska.
[5] US Forest Service Forest Inventory and Analysis program, 2015 data (modified to represent weight of green wood).
[6] US Forest Service Forest Inventory and Analysis program, 2015 data.

Market Potential

Based on existing woodchip market prices, cedar woodchips delivered to a boiler for thermal applications are valued at between $45 and $65 per ton. At these prices for relatively low value woodchip fuel, the current standing cedar biomass resource of 8.9 million tons5 currently growing in Nebraska is worth between $400 and $580 million. Being a renewable resource, cedar forests produce approximately 345,000 tons6 of new wood every year, nearly all of which grows on private land . Annual growth in cedar statewide could sustainably and indefinitely generate between $16 and $22 million in wood chip sales every year, should markets be developed for this resource.

Higher-value markets such as sawlogs, fence posts, and wood shavings are also significant opportunities. Nebraska's cedar forests contain approximately 3.6 million tons5 of sawlogs and 2.4 million tons5 of post sized material, with the remaining 2.9 million tons5 comprised of low-value trees and tree tops and limbs removed from trees turned into sawlogs and other products. With the current market prices of sawlogs ($60-$120/ton) and post-size materials ($45-$80/ton), the sawtimber and post-timber component of the state's cedar population has a value of $324-624 million. The remaining 2.9 million tons5 still have the opportunity to be sold in wood chip markets (biomass, mulch, etc.), with a value of $130-190 million. This "higher value" model of cedar utilization increases the total value of the state's cedar resource to $455-813 million, statewide.

Current Efforts That Address the Spread of Cedar

- **Financial assistance programs for cedar mechanical removal**. A number of federal and state agencies and NGOs [NRCS, Nebraska Forest Service (NFS), National Wild Turkey Federation (NWTF), NE Game and Parks Commission (G&PC), among others] provide landowners statewide with several million dollars annually in cost-share funds, as well as on-the-ground technical assistance to mechanically remove, pile, and chip or burn cedar debris on grasslands and in forests.
- **Financial assistance programs for prescribed burning** of cedar grasslands, and for burning cedar slash piles in forests. Several federal and state agencies and NGOs (NRCS, NFS, TNC, Pheasants Forever, G&PC, and NWTF provide cost-share funds, training and/or technical assistance in the use of prescribed fire, burning thousands of acres/year.
- **Forest management assistance**. The NFS and NRCS provide landowners with cost-share funds to thin existing pine and cedar forests to maximize forest health, resilience, productivity and value.
- **Market and Business Development**. Several financial assistance programs (grants, low-cost loans, etc.), as well as technical assistance are available from federal and state agencies to support the development or expansion of businesses or organizations that process or use cedar, including USDA Rural Development, Nebraska Department of Economic Development, Nebraska Department of Environmental Quality (equipment grants), Small Business Administration and the NFS.
- **Outreach and Education**. Many organizations work to inform and educate the public, landowners and decision makers on cedar issues and opportunities via publications, newsletters, electronic/social media, etc.

Addressing the Cedar Challenge: A Road Map for Action

Members of the Nebraska Conservation Roundtable identified the following necessary actions that together comprise a comprehensive strategy that addresses the expansion of cedar:

- Better define the problem and identify priority geographic areas for action
    - Conduct intensive aerial and on-the-ground inventories, especially of grasslands and rangeland
    - Geospatially map:
    - Cedar occurrence, density, height, age, etc.,
    - Land ownership patterns (absentee/rental vs owner-operated rangeland)
    - Compare to previous surveys where available to identify areas with greatest rates of spread
    - Grassland productivity (current and without cedar)
    - Conduct geospatial analysis to determine areas where interventions will show the greatest impacts (e.g., on highest productivity grasslands) and where interventions will show greatest relative chance for success (e.g., areas with low to moderate density cedar)
    - Develop criteria for determining priority areas (economic benefits, wildlife benefits, reduce risk to wildfire, etc.)
    - Delineate priority areas and develop targeted programs
- Facilitate development of new cedar products, markets and businesses that provide sustainable, long-term economic incentives and market drivers for cedar removal, processing, marketing and management
    - Expand existing and establish new financial and technical assistance programs to increase the number and capacity of cedar harvesting and processing entrepreneurs

- Expand business recruitment and economic development efforts to attract new enterprises to Nebraska to utilize the cedar resources
- Facilitate development of efficient and cost-effective tree-to-user processing and supply chains
- Expand existing and establish new financial and technical assistance and outreach programs to increase the number of users (private and public) of cedar products.
- Initiate/expand financial assistance for development of new cedar products with large volume, large-scale potential (e.g., bioenergy, mulch, animal bedding, biochar, chemicals, timber products, specialty products, goat meat, etc.)
- Work with the state's forest products industry to identify and address business development barriers

- Identify alternative species for windbreaks and educate landowners about those alternatives
- Expand cedar mechanical and prescribed fire removal and management cost-share and technical assistance programs
  - Target technical and financial assistance to specific groups, especially resident and absentee landowners.
  - Identify lower risk prescribed fire approaches
- Develop, test and promote innovative approaches that support cedar removal on grasslands such as integrating goats into grazing systems.
  - Conduct targeted research
  - Map the cedar genome with particular emphasis on identifying markers that determine male and female trees
  - Develop genetic tests at the seedling stage to detect tree gender to enable rogueing of female trees in the nursery.
  - From existing cedar stands, identify individual male trees with superior characteristics with potential for clonal production
  - Develop vegetative propagation and tissue culture techniques for the mass production of male trees with superior characteristics
  - Develop conservation planting designs that would allow for elimination of female cedar trees upon detection while preserving the function of the planting.
- Conduct policy and legislative analysis
  - Examine federal and state policies and current state statutes to identify conflicting statutes or regulations, barriers for cedar management, and changes that would improve large-scale management.
  - Make recommendations and facilitate influencing efforts to secure needed legislative and/or regulatory changes.
- Conduct extensive education and outreach activities
  - Target consistent messaging to specific groups: e.g., resident and absentee landowners, businesses and entrepreneurs, policy makers, agency personnel and decision makers.
    - Develop educational and outreach materials that document the scope, severity of current and future expansion, and priority areas for action
      - Develop BMPs and technical guides on:
        - cedar forest management,
        - managing grasslands with cedar,
        - using prescribed fire for cedar reduction and management
        - methods for cedar mechanical, chemical and other control measures.
- Identify new potential partners for joint action and coalition building such as the NE Invasive Species Council, NE Eastern Redcedar Task Force, and the Prescribed Fire Council.

Organizations and Agencies supporting the Eastern Redcedar Issue Paper:

Nebraska Wildlife Federation

Nebraska Ornithologists' Union

Crane Trust

Ducks Unlimited

Sierra Club

U.S. Fish and Wildlife Service – Partners for Fish and Wildlife Program

Sandhills Task Force

The Nature Conservancy

Nebraska Game and Parks Commission

Nebraska Cooperative Fish and Wildlife Research Unit

Nebraska Forest Service

National Wild Turkey Federation

Nebraska Sportsmen's Foundation

Nebraska Land Trust

Playa Lakes Joint Venture

Audubon Nebraska

Nebraska Natural Resources Conservation Service

Nebraska Big Game Society

Nebraska Pheasants Forever

Big Game Conservation Association

2016-55136 1/23/17MC

Good afternoon, I'm Craig Derickson with the U.S. Department of Agriculture. I am the State Conservationist for the Natural Resources Conservation Service. Our agency has over 300 employees across Nebraska in 77 field offices. These field offices work directly with Nebraska's farmers and ranchers to conserve and enhance natural resources on privately owned land.

Our conservation programs are created and directed through the Farm Bill. They are strictly voluntary. Our customers come to our field offices when they have a concern about soil erosion, water quality, wildlife, or other natural resource issues. Our staff provides one-on-one assistance crafting conservation plans to meet each farm or ranch operation's needs.

One of those needs is the issue being discussed today – the control of eastern red cedar trees. As a life-long conservationist, I am encouraged that this conversation is occurring, and I am honored to have the opportunity to participate in this discussion.

Since the mission of the Natural Resources Conservation Service is "Helping People Help the Land," the ways in which we provide that help can vary from eastern Nebraska to western Nebraska, from corn/soybean farms to cattle ranching operations. Some of these operations are seeking ways to plant cedar trees to provide protection from wind for their livestock, crops or farmstead, while other operations are seeking ways to remove cedar trees from their grazing land.

The conservation programs the Natural Resources Conservation Service offers have the flexibility to provide assistance to both scenarios.

The 1996 Farm Bill created the Environmental Quality Incentives Program – commonly referred to as "EQIP." It is our most comprehensive and flexible program. It provides financial assistance to farmers and ranchers to address a wide variety of natural resource concerns – including soil erosion prevention, wildlife habitat creation, rangeland management, grazing land improvement, and more.

Since 1997 (This is the first year we have data collected for EQIP after it was created in the '96 Farm Bill) over 100,000 producers in Nebraska have received over $340 million through EQIP. Out of this amount, over $19 million – or 5.8% of the total EQIP dollars spent – have been used to either plant eastern red cedars, primarily in windbreaks; or to remove eastern red cedars from grazing land.

Let's take a closer look at these two contrasting conservation practices.

Planting Eastern Red Cedar Trees

Since 1997, the Natural Resources Conservation Service has offered funding through EQIP to plant windbreaks on privately owned farming and ranching operations. Eastern red cedar trees are used in most of the windbreaks planted, in combination with other species. Since 1997, over $2 million of EQIP funding was used to help over 1,900 producers install over 6 million feet of windbreaks.

Removing Eastern Red Cedar Trees

Since 1997, the Natural Resources Conservation Service has offered funding through EQIP to remove eastern red cedar trees on privately owned farming and ranching operations. The two primary conservation practices used to remove cedar trees are brush management and prescribed burning. Let me provide more details about these conservation practices:

1. Brush management provides funding for landowners to remove woody plants, including eastern red cedars, on all privately-owned land except cropland. The woody vegetation is removed by physically cutting them down, applying herbicide, or a combination of both depending on site conditions. The amount of funding available to conduct brush management through EQIP greatly varies from around $15-$196/acre. The amount of funding available to perform brush management through EQIP depends on the number of acres to be treated, where the area needing treatment is located (i.e. next to a stream, wetland, or uplands), the steepness of the terrain, and the level of infestation of the woody species. For example, a site with rough terrain next to a stream and a high rate of infestation would be much more expensive to manage than a small, level pasture with just a few cedars. Sites requiring the most difficult methods of brush management receive the highest level of funding. The funding provided through EQIP helps make what is often an expensive management practice more attainable and feasible to landowners. Since 1997, through brush management, over $15 million was paid to over 4,000 producers to removed eastern red cedars from over 225,000 acres.

- Prescribed burns are planned, highly-managed fires deliberately set by a "burn team." This controlled fire permanently kills cedar trees, removing them from the landscape helping to increase forage capacity for livestock and wildlife. Land eligible for EQIP funding includes: privately owned grassland, wildlife land or forestland. The amount of funding available to conduct a prescribe burn through EQIP varies from around $6-$16/acre, depending on the number of acres to be burned, how rough the terrain, and the amount of fuel load present. The cost of conducting a prescribed burn is corelated to the level of risk associated with the burn – the higher the risk, the higher the cost. For example, a large, steep pasture mostly covered by cedar trees would receive a higher amount of funding through EQIP than a small, level pasture with just a few cedar trees. Since 1997, through prescribed burning – over $1.5 million was paid to over 600 producers to burn over 170,000 acres. In addition to the funding EQIP provides landowners to carry out this practice, we also provide the planning required to conduct a safe burn. Obviously, this management practice comes with potential risk. The planning assistance given by the Natural Resources Conservation Service gives producers not only the financial feasibility, but also the peace-of-mind needed to carry out this highly-effective practice.

The Natural Resources Conservation Service has other conservation programs that also provide funding to manage eastern red cedar trees. The Working Lands for Wildlife program provides funding to help manage eastern red cedar trees with the goal of restoring and enhancing habitat for the greater prairie chicken in the Sandhills. However, EQIP is the conservation program that provides Nebraska the most financial and technical assistance towards the management of eastern red cedar trees.

Future Considerations for Managing Eastern Red Cedars

I've given you an overview of what our agency is currently doing regarding the planting and removal of eastern red cedar trees. The Natural Resources Conservation Service in Nebraska is currently considering potential changes in how we provide funding to projects involving eastern red cedar trees. Factors currently under consideration include:

1. Areas that are vulnerable to the spread of eastern red cedar would be considered a low priority for receiving EQIP funding to plant eastern red cedar trees in windbreaks.

2. Develop viable alternatives to planting eastern red cedar trees.

The Natural Resources Conservation Service will consider feedback from a variety of conservation partner agencies and organizations prior to changing EQIP policies. We have a strong and trusted conservation partnership here in Nebraska. This can only be an asset as we move through this issue.

I look forward to further discussions regarding this important subject. I am enthusiastic to offer any further information or assistance to this effort. And I thank you again for the opportunity to speak to you all today. Thank you.

USDA United States Department of Agriculture

SANDHILLS PROJECT

WORKING LANDS FOR WILDLIFE

A HOSTILE TAKEOVER

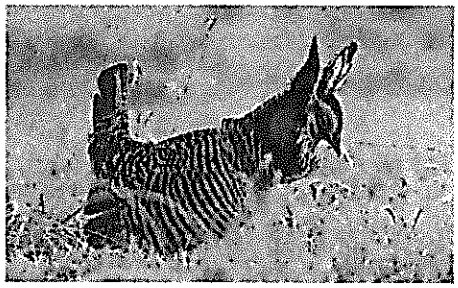
The Sandhills landscape of Nebraska is speckled with lakes, wetlands, wet meadows, spring-fed streams - and unfortunately - too many eastern red cedar trees.

The 19,300-square-mile grass-covered sand dune formation in north-central Nebraska serves as an oasis for wildlife, including the greater prairie-chicken and American burying beetle. The Sandhills are also critically important to waterfowl, who nest in the region.

The conversion of rangelands to cultivated crops and the spread of invasives like red cedar trees are causing habitat loss and fragmentation throughout the Sandhills. To reverse the loss and fragmentation of habitat, NRCS is working with agricultural producers to install grazing management practices to improve rangeland health and wildlife habitat.

LANDOWNERS ARE PART OF THE SOLUTION

Landowners in Nebraska are helping restore the Sandhill landscape by improving the health of rangelands using prescribed grazing and removing invading cedar trees.



Photos by Aaron Price, USDA

Sandhills Stats

Location: North-Central Nebraska

Habitat Type: Grassland, wetlands, wet-meadows

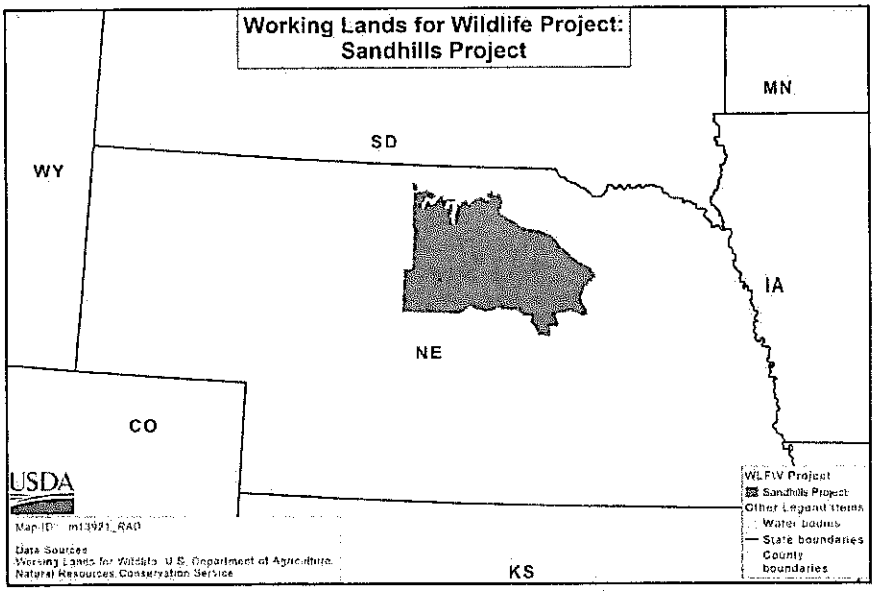
Target Species: Greater Prairie Chicken and American Burying Beetle

Other Species: Western Prairie Fringed Orchid, Dicksissel, Eastern Meadowlark, Field Sparrow, Grasshopper Sparrow, Swainson's Hawk, Monarch Butterfly, Upland Sandpiper, Western Meadowlark, Sharp-tailed Grouse and Regal Fritillary Butterfly

Partners: Landowners, Sandhills Task Force, Nebraska Cattlemen, Rainwater Basin Joint Venture, Nebraska Game and Parks, U.S. Fish and Wildlife Service, Pheasants Forever

SANDHILLS PROJECT

Through grazing management, mechanical removal and prescribed burning, producers can manage this threat to the landscape as cedar trees shade out other plants, which degrades the quality of forage for livestock and habitat for wildlife.



Land within the WLFW Sandhills Project area is eligible for funding from NRCS to remove cedar trees, install grazing land enhancement practices, and improve wildlife habitat.

OWN OR MANAGE LAND? YOU CAN HELP

Landowners can improve the health of rangelands by working with the USDA Natural Resources Conservation Service (NRCS) to implement a variety of conservation activities, or practices, that benefit the landscape and many of the game and non-game species that depend on it.

Technical assistance from NRCS is free to producers. The agency's staff of experts and conservation partners work side-by-side with producers to develop a conservation plan. Each plan focuses on implementing conservation practices to improve ranching operations while improving rangelands. These plans provide a roadmap for how to use a system of conservation practices to meet natural resource and production goals.

Financial assistance helps producers pay for the adoption of conservation systems. Common conservation practices include prescribed burning, prescribed grazing, conservation cover and brush management.

WORKING LANDS FOR WILDLIFE

These efforts are part of the Working Lands for Wildlife (WLFW) partnership, a collaborative approach to conserve habitat on working lands in the Sandhills. WLFW is providing technical and financial assistance through the Environmental Quality Incentives Program, a Farm Bill conservation program, the largest funding source for conservation on private lands.

When the health of the Sandhills landscape is improved, many species benefit, including greater prairie-chicken, American burying beetle, eastern and western meadowlark, grasshopper sparrow, Swainson's hawk, monarch butterfly, upland sandpiper, sharp-tailed grouse and regal fritillary butterfly.

READY TO GET STARTED?

If you're interested in technical and financial assistance from NRCS, please contact your local USDA Service Center. An NRCS conservationist in your community will help you develop a conservation plan customized to your land, and if you're interested, apply for financial assistance through Farm Bill conservation programs.

WORKING LANDS FOR WILDLIFE

Learn more:

nrcs.usda.gov/wildlife

Nebraska

USDA NRCS
United States Department of Agriculture
Natural Resources Conservation Service

EQIP

Environmental Quality Incentives Program

Overview

The Environmental Quality Incentives Program (EQIP) provides financial and technical assistance to agricultural producers in order to address natural resource concerns and deliver environmental benefits such as improved water and air quality, conserved ground and surface water, reduced soil erosion and sedimentation or improved or created wildlife habitat.

USDA's Natural Resources Conservation Service offers voluntary farm Bill conservation programs that benefit agricultural producers and the environment.

Helping People Help the Land

Benefits

Eligible program participants receive financial and technical assistance to implement conservation practices, or activities like conservation planning, that address natural resource concerns on their land. Payments are made to participants after conservation practices and activities identified in an EQIP plan of operations are implemented. Contracts can last up to ten years in duration.

Eligibility

Agricultural producers and owners of non-industrial private forestland and Tribes are eligible to apply for EQIP. Eligible land includes cropland, rangeland, pastureland, non-industrial private forestland and other farm or ranch lands.

Socially disadvantaged, beginning and limited resource farmers, Indian tribes and veterans are eligible for an increased payment rate and may receive advance payment of up to 50 percent to purchase materials and services needed to implement conservation practices included in their EQIP contract.

Applicants must:

- Control or own eligible land
- Comply with adjusted gross income limitation (AGI) provisions
- Be in compliance with the highly erodible land and wetland conservation requirements
- Develop an NRCS EQIP plan of operations

Additional restrictions and program requirements may apply.

How to apply
Visit your local USDA Service Center to apply or visit www.nrcs.usda.gov/getstarted.

NRCS will help eligible producers develop an EQIP plan of operations, which will become the basis of the EQIP contract.

EQIP applications will be ranked based on a number of factors, including the environmental benefits and cost effectiveness of the proposal.

More Information
For more information visit NRCS in your local USDA Service Center or www.ne.nrcs.usda.gov.

Find your local USDA Service Center
http://offices.usda.gov

What's New in EQIP

- The former Wildlife Habitat Incentive Program (WHIP) was folded into EQIP.
- Advance payment opportunities now exist for veteran agricultural producers.
- Advance payments for socially disadvantaged, beginning and limited resource farmers, Indian tribes and veterans were raised from 30 percent to 50 percent.
- Payment limitations are set at $450,000 with no ability to waive.

This pond provides water for livestock and habitat for wildlife.

www.ne.nrcs.usda.gov

Natural Resources Conservation Service

Good afternoon Senators, members of the Natural Resource Committee and Chairman Hughes, my name is Adam Smith, I am the Forest Products Program Leader for the Nebraska Forest Service and I am testifying on my own accord and not on behalf of the University of Nebraska.

Background/History

Eastern redcedar is a native tree of Nebraska, historically confined to deep ravines and north facing slopes that are protected from fire. Historically, frequent prairie fires controlled encroaching redcedars and rejuvenated the grasslands. However, suppression of these fires for decades has facilitated the conversion from grassland into undesirable shrubland, negatively impacting the bottom-line of agriculture, biodiversity, and our iconic vision of Nebraska's grasslands.

Management

The lack of natural fire has allowed redcedar in some areas to mature, creating a scenario in which the use of fire for control can be unsafe due to the potential increased fire intensity, increased risk to prescribed fire practitioners, and negative air quality impacts. However, the use of prescribed fire as a proactive management tool is still a cost-effective and efficient tool for managing the encroachment of small cedars.

Once trees mature, the best option for management shifts toward mechanical treatment; specifically cedar removal via chainsaw, skid-steer equipment or larger machinery. While mechanical management is effective, it is expensive and routine prescribed fire is still needed to maintain the area as grassland.

After mechanical management, landowners are often left with large brush piles, which are disposed of by burning. However, the burning of redcedar piles, or large, dense stands of trees, results in wasted economic opportunities and increases environmental impacts of management.

Traditional Wood Products

According to a survey completed in 2014 by the Nebraska Forest Service and US Forest Service, Nebraska wood products manufacturing facilities (such as sawmills) used redcedar wood to produce...

- 870,000 board feet of sawlog products
  - Such as lumber, paneling and fencing
- 8,600 cubic yards of animal bedding
  - Enough to cover Tom Osborne Field at Memorial Stadium in four (4) feet of material
- 61,000 cubic feet of fence posts
  - Equivalent to more than 105,000 four (4) inch fence posts
  - Enough posts to install a fence spanning from South Dakota to Kansas

Additionally, the Nebraska College of Technical Agriculture uses approximately 750 tons of redcedar chips each year as boiler fuel to heat 200,000 square feet of building space. The manufacture of these products supports rural economies and provides jobs.

Figure 1. Annual Redcedar Wood Product Production (in thousand cubic feet)

	TPO Survey Year			
Product Type	**2000**	**2006**	**2009**	**2014**
Saw logs	34	69	82	186
Shavings	279	703	296	231
Posts	<1	1	8	61
Other products	-	-	7	-
All products	314	773	393	478

Image 1-Animal bedding produced from redcedar wood by a Nebraska business.

Image 2-Redcedar logs staged for processing at a Nebraska sawmill.

Innovative Wood Products/Partnerships

Aside from the traditional wood products, the Nebraska Forest Service works with partners to identify new strategies to utilize redcedar wood and decrease its waste. We have partnered with the Middle Niobrara Natural Resource District and the Department of Biological Systems Engineering at UNL to investigate using redcedar woodchips combined with livestock manure (both critical waste management issues) as a soil amendment in the sandy soils in north-central Nebraska to improve soil health and soil moisture retention. During this project, we have demonstrated that woodchips combined with manure can decrease soil temperatures by 2°F and increase soil water by 30-40% in the top 12 inches of soil (approximately 0.5 inches of water). Researchers recently received a grant to expand this project statewide.

The Nebraska Forest Service has also worked with the University of Nebraska-Lincoln, College of Architecture to provide the opportunity for students to design and build a unique cabin at Cedar Point Biological Research Station in Ogallala. Students used locally-available redcedar to produce external building siding and internal finishings as demonstrations of opportunities to utilize redcedar wood. Across the state, entrepreneurs have also capitalized on redcedar wood, creating unique furniture pieces providing income for them and their families.

Image 3-Soil samples showing increased moisture.

Image 4-Cabin at Cedar Point Biological Station built with cedar products.

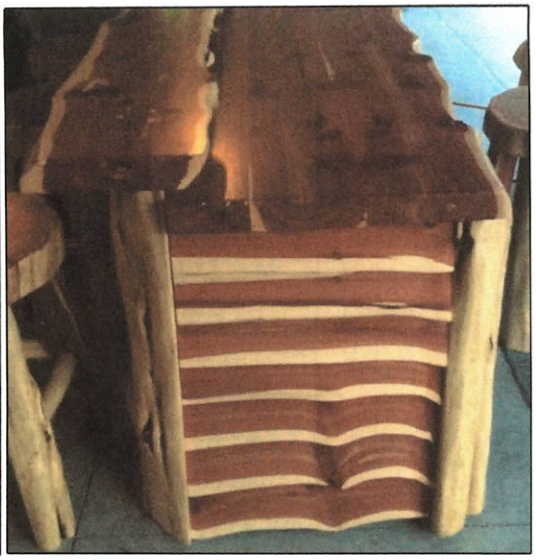


Image 5-Custom furniture built from cedar by a Nebraska business.

Environmental Benefits of Utilization

More often than not, redcedar management residue is piled and burned. However, the environmental impacts of pile burning can be significant. Using the online "Piled Fuels Biomass and Emission Calculator" available from the University of Washington, I was able to model the emissions from burning various sized piles of residue. For instance, a redcedar burn pile, measuring 10 feet tall and 20 feet in diameter would emit...

- ~100 pounds of particulate matter less than 2.5 micrometers (PM2.5)
    - small enough to inhale and cause health issues
    - can travel hundreds of miles from the source
- ~10 tons of carbon dioxide (CO_2)
    - Equivalent to the annual emissions from two passenger vehicles (according to EPA)

To put this into more context, if we were to burn all of the sawlogs (186,000 cubic feet) which were used to make wood products in 2014 (instead of turned into wood products), that burn would emit...

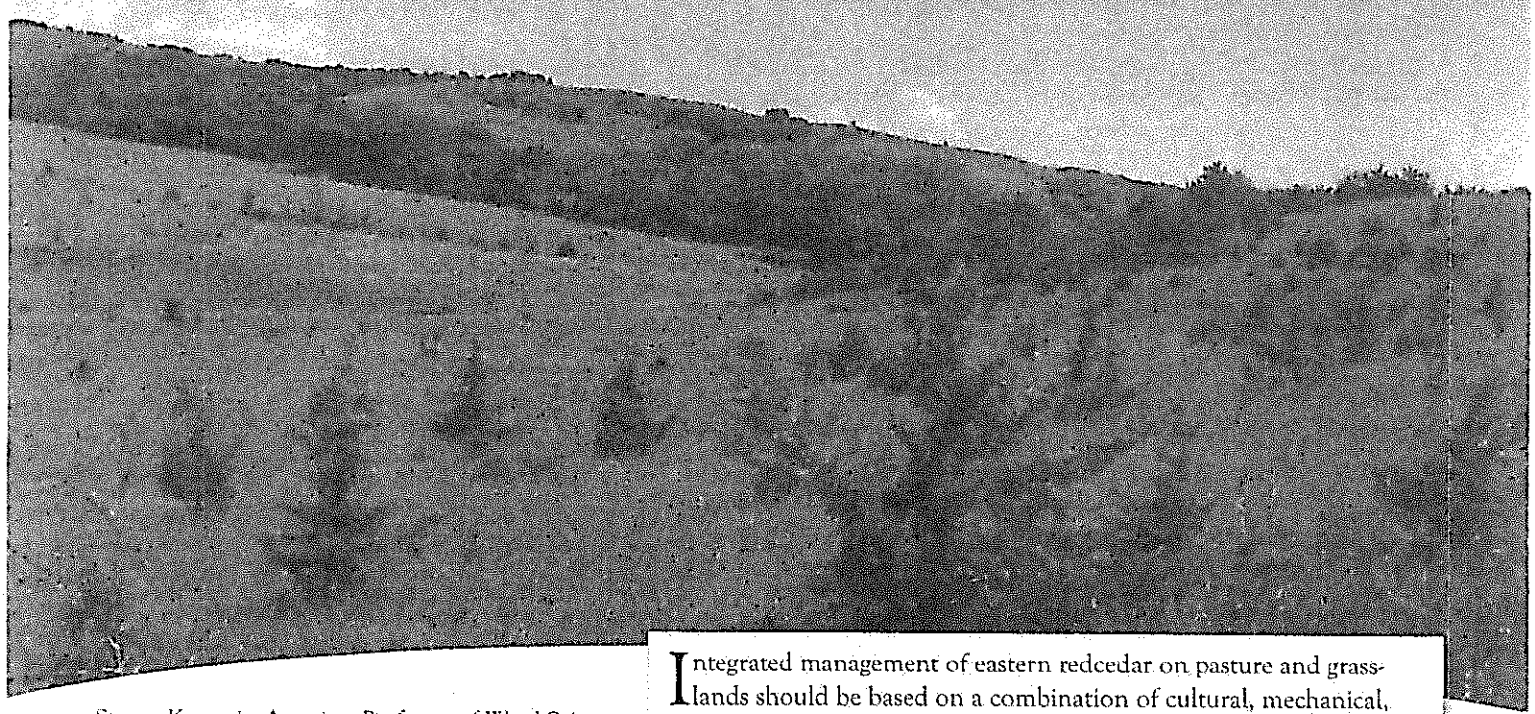
- ~19 tons of PM2.5
- ~4,600 tons of CO_2
    - Equal to the annual emissions of 920 passenger vehicles

Utilization of these sawlogs has stored these would-be emissions within the wood products themselves, reducing the environmental impacts of management while...

- increasing forest health
- restoring grazing capacity
- improving overall ecosystem health

University of Nebraska Lincoln EXTENSION
EC186

Integrated Management of Eastern Redcedar



Stevan Knezevic, Associate Professor of Weed Science
Steve Melvin, Extension Educator
Terry Gompert, Extension Educator
Steve Gramlich, Extension Educator

IANR

Integrated management of eastern redcedar on pasture and grasslands should be based on a combination of cultural, mechanical, biological and chemical tools to keep this tree from continuing to spread while protecting grassland production and profits. Tree height should be used as a determining factor for control options. Burning, cutting, digging, mowing, use of goats and broadcast herbicide application are effective on trees up to 2 feet tall. Cutting and individual tree herbicide treatments work well on eastern redcedar 2-10 feet tall. Trees over 10 feet tall are most effectively and economically controlled by cutting. The bottom line is "control trees while they are small."

History and Biology

Eastern redcedar *Juniperus virginiana* L.) *(Figure 1)* is one of 13 juniper species native to the United States. It is the most widespread tree-sized conifer and is native to every state east of the 100th meridian. Throughout this vast range, eastern redcedar grows on many soils and under varying climatic conditions. This adaptability has enhanced eastern redcedar's recent spread into areas where it was formerly rare or absent. Eastern redcedar is a dioecious species, which means individual trees are either male or female. Starting in the sixth or seventh year of growth, female trees produce small, berrylike fruits that are eaten by many birds and some small mammals, which indirectly helps spread the seed via droppings. Digestion actually improves germination.

First accounts of Nebraska vegetation mention eastern redcedar as a native tree species, primarily along the steep valley of the Niobrara River in northern Nebraska, as a minor component in deciduous forests in eastern Nebraska, and as a dominant species on canyon sides in the rugged Loess Hills region of central Nebraska *(Figure 2)*. Today, native stands of eastern redcedar can be found on most grasslands throughout central and eastern Nebraska and in much of the Midwest.

Since Europeans settled in the region, many factors have changed, allowing this minor native tree to become a serious grassland pest. Early records from the Loess Hills note that eastern redcedars were confined to the steepest canyons, usually on north-facing slopes where moisture levels were highest. The role of wildfire in confining the trees was obvious — trees near the edges of these stands displayed repeated fire damage. The species' adaptability and hardiness made it a favorite of pioneer tree planters. Millions of eastern redcedar trees have been planted in the Midwest for windbreaks, landscaping, and wildlife habitats. These plantings accelerated with the conservation programs of the 1930s.

Figure 1. Eastern redcedar *(Juniperus virginiana* L.*)*

Figure 2. Redcedar is a dominant species on canyons of central Nebraska.

Impact of Eastern Redcedar

Eastern redcedar is a problem on grasslands primarily because it reduces forage production. Developing trees alter the microclimate, which encourages a shift from desirable warm-season native grasses to introduced cool-season grasses such as Kentucky bluegrass *(Poa pratensis* L.*)*. Heavy infestations make livestock handling more difficult. All these adverse effects can be reflected in lower rental rates or sale prices for infested grassland. Established infestations usually get worse over time due to overproduction of seeds and established trees get bigger, thus shading grass even more. On many sites, complete coverage by eastern redcedar can be expected, resulting in total loss of grass production unless controlled. Control measures should be initiated as soon as possible, both to improve effectiveness and reduce total control costs.

Integrated Management of Eastern Redcedar

Integrated management has been commonly described as "a multi-disciplinary approach utilizing the application of numerous alternative control measures." In practical terms, it means developing a management program based on the best combination of methods for a particular site, which could include mechanical, biological and/or chemical practices.

Eastern redcedar infestations in Nebraska and surrounding states have developed over several decades. Management of these infestations is best viewed as a long-term or on-going effort, both to reduce the initial infestations and prevent them from redeveloping to economically damaging levels. Emphasis should be on management of the infestation, rather than eradication. Eradication is not economical and probably not physically possible in most cases. Instead, it should be recognized that some remaining larger trees, which are the most difficult and expensive to kill, do little damage. In fact, at low levels, eastern redcedars can be viewed as a potential resource, providing livestock shelter, wildlife habitat, timber products, and aesthetic values. Most

important, long-term selective management is considerably less expensive than a more intensive, short-term approach.

If the goal is to reduce overall number of trees and stop further spreading (e.g. management of wildlife habitat), it is recommended to cut female trees only. Female trees are the ones that produce berry-like fruits with seeds. This would allow "male trees" to grow and provide much needed cover for wildlife or land beautification, while reducing further spreading.

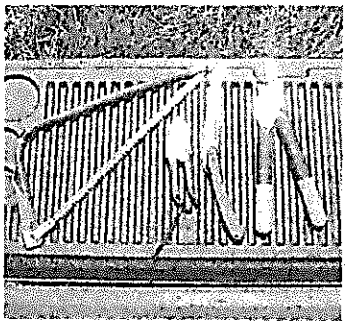


Figure 3. Variety of hand tools that are effective on short trees.

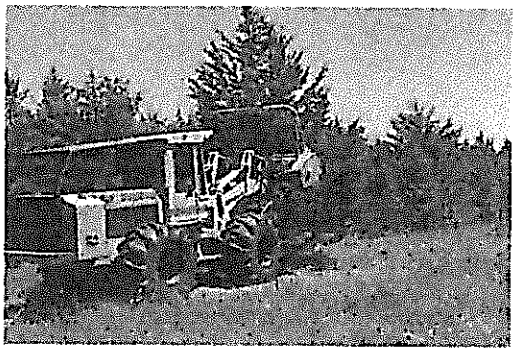


Figure 4. Mechanical means of controlling larger trees.

Manual and Mechanical Control

Manual and mechanical control involves methods such as digging, cutting and mowing trees. It is very effective for small areas, and it is most efficient on trees up to 2 feet tall.

Cutting is an effective method of control because eastern redcedar is a non-sprouter. Trees cut below the lowest branches will not regrow. A variety of handheld or motor-powered cutting tools can be used. Handheld tools (shears, saws, spade, shovel, heavy hoe) *(Figure 3)* are effective on small trees (less than 3 feet tall), while larger trees require a chain saw or vehicle-mounted shears. The equipment varies from tractor-pulled PTO-driven shredders to hydraulic drive devices that mount on skid steer loaders. Most of the shredders can easily handle up to 3-4 inch stem diameter trees, while some can cut trees up to 15 inches in diameter *(Figure 4)*. Tractor-mounted shears may not be able to safely operate on steep slopes. Sawing larger trees with a chainsaw can be potentially dangerous because all lower branches must be removed before cutting the main trunk. Otherwise, the operator can be injured when the tree falls.

An alternative and relatively new tool for cutting trees up to 3 inches in stem diameter is commonly known as a "cedar eater" *(Figure 5)*. It is a simple device containing two stationary blades within the fork-like frame. The whole unit can be mounted in the front of an ATV or a small tractor. The operator drives the unit into the tree and the blades cut the tree off, leaving just a flat-cut stump *(Figure 6)*. This can be a very effective method on those pastures with many trees varying in height from 1 to 6 feet tall *(Figure 7)*.

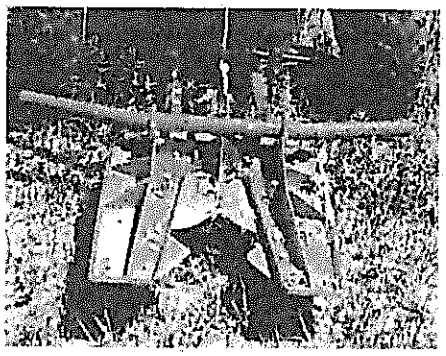


Figure 5. An ATV-mounted "cedar eater".

Figure 6. Remains of stump cut by cedar eater.

Figure 7. Grassland with many trees varying in height from 1 to 6 feet tall.

In general, cutting is a method that can be time consuming and labor intensive. Cutting alone also fails to remove all of the problem because fallen trees continue to occupy space. Oklahoma research found that the durable skeletons of fallen trees occupy 70% of the space of living trees. Such areas can be lost to production for years because livestock are reluctant to graze among dry and sharp branches. Thus, all cut trees should be gathered and burned, or permanently removed from the grassland.

Prescribed Burning

This method is inexpensive and very effective against smaller trees. Its effectiveness declines as tree size increases, but there are cases of successful burning of tall trees *(Figure 11)*. Adequate fine fuel (usually last year's dead grass) is necessary for satisfactory results. Safety also is a concern since many managers lack experience with fire and the equipment required to conduct fires.

The controlled use of fire is a large subject in itself. It is beyond the scope

Figure 11. Tall eastern redcedar trees controlled with fire.

of this publication to provide detailed instruction on conducting prescribed fires. For future information on the use of fire in general and on how to safely conduct fires, check with your local Extension office. A fire plan should be prepared and a prescribed burning permit obtained from the local fire jurisdiction, as required by state law. Specialized fire equipment can be purchased. Two sources are the Ben Meadows Company, 3589 Broad St., Chamblee, GA 30341; and Forestry Suppliers, Inc, Box 8397, Jackson, MS 39284-8397.

Regarding eastern redcedar specifically, prescribed fire is important both to initially reduce infestations and to maintain trees at economically tolerable levels. Research indicates that prescribed fires used primarily to control eastern redcedar should be conducted about April 1. Foliage is drier then and ignition of large trees is more likely. Fires should be conducted under conditions which are as warm and dry as is consistent with safety. Lower wind speeds, from 5 to 10 mph, will increase the duration of high temperatures and damage to larger trees. On the other hand, higher winds increase flame length and the potential for ignition of trees. In some cases fire alone may be adequate. In other cases supplemental treatment may be necessary. Fortunately, a number of treatment options are available to fit different circumstances.

Several variables should be weighed when considering options. These include location within the state, difficulty of burning the area in question, age and density of trees, the density of surviving trees that can be tolerated, kind of grassland vegetation, and the availability of labor or capital.

Location

Eastern Nebraska lies within the tallgrass prairie region, while central Nebraska, including the Loess Hills, is in the mixed prairie region. The tallgrass region potentially produces greater fine-fuel loads, and thus more intense fires and higher eastern redcedar mortality. Fire can be used more frequently here with less risk of adverse effects to other vegetation, which can occur when drought follows spring fire. This means that fire alone on a short rotation, perhaps even annually, may suffice in the east. In the mixed prairie region, fine-fuel loads tend to be lower and control from fire alone may be less, while arid post-fire conditions also are more likely. In central Nebraska fire should be used more conservatively, at intervals of several years. This makes it more likely that limited supplemental treatments will be necessary to achieve management goals.

Difficulty of Burning Individual Land Units

Lighting a prescribed fire often carries some risk of it escaping. Eastern Nebraska pastures more often are isolated by roads, cultivated lands, and other firebreaks that will confine the fire and minimize risk. This means that fire may be safely used more often and under more favorable burning conditions. In central Nebraska, pastures often are located within large blocks of rangeland, making escape more likely and serious. This suggests the need for more planning and care on how to conduct the fire safely. It also argues for a more sparing use of fire and reduces the chance that fire alone will suffice.

In some cases, the difficulty and risks of burning in areas of extensive grasslands can be greatly reduced by conducting "landscape-scale" fires, rather than burning pastures individually. Under the landscape-scale concept, the fire boundary is extended until adequate existing firebreaks are encountered. These may be roads, watercourses, cultivated lands, stands of broadleaf trees, relatively non-flammable canyon bottoms, or areas of short or green vegetation. Such large areas frequently contain the holdings of multiple landowners. Obviously, all landowners and managers within the area must be in agreement about the proposed burn.

Age and Initial Density of Trees

Eastern Nebraska infestations tend to be younger and more dispersed. This will improve control levels achieved by fire alone. In the rugged Loess Hills, where eastern redcedar is native, infestations include dense stands, usually on north-facing slopes, and larger trees. These stands are less susceptible to fire and may require supplemental treatment. In fact, some dense stands may be better left alone because little vegetation remains under the canopy and the danger of soil erosion is great on steep slopes if trees are removed. Management efforts may be better concentrated on developing stands that are easier to attack and threaten future productivity much more.

Density of Surviving Trees that Can be Tolerated

The number of surviving trees that can be tolerated depends on the owners' preference. Low numbers of surviving trees will have minimum effect on future productivity. Most surviving trees will be the largest and oldest in the population. These may have a near-term value as fence posts and would pay for their own removal. Low numbers of such trees also furnish livestock shelter and improve habitat for popular game animals such as deer and wild turkey.

Kind of Existing Vegetation

Most research on prescribed fire in grasslands relates to warm-season native grasses, either in rangeland or planted pastures. Much less is known about the use of fire on cool-season grasslands. For planted cool-season pastures, fires would have to be conducted as much as six to eight weeks earlier than on warm-season grasses, probably no later than mid-March to minimize damage to the grass.

The situation on degraded, cool-season dominated range is more complex. Fires conducted early will encourage the cool-season grasses at the expense of the remnant warm-season grasses. Fires conducted around May 1, at the optimum time to favor warm-season grass growth, will damage the cool-season grasses. While that is often desirable, a manager may have come to depend on early production from a cool-season range. Much of this production will be lost if fire is used. Total production also may be temporarily reduced if the remnant warm-season grasses are too scarce or weakened to take advantage of the suppression of the cool-season grasses.

Use of fire should be carefully considered on all lands. Ideally, fire should be incorporated as part of a long-term pasture-management plan designed both to reduce eastern redcedar infestations and improve range condition while maintaining or improving productivity.

Chemical Control

Herbicides also can be considered for control of this tree species as an important part of the integrated management program. Depending on the application method and chemical type, the use of herbicides can be time consuming and expensive, especially when used on denser tree infestations or large tracts of land. Effectiveness also is variable depending on the tree size and label directions and/or restrictions. Therefore, always read and follow herbicide label directions. Herbicide information on control of troublesome plant species, including eastern redcedar, is updated annually in the *Guide for Weed Management in Nebraska* (EC130). In general, herbicides for eastern redcedar control can be used for broadcast application or individual tree spraying.

Table 1. Percent eastern redcedar control and grass injury levels (burning) at about 100 days after treatment as influenced by the tree height (feet) when herbicide treatments were broadcast applied.

	Dose	Tree Height (ft)				Grass Injury
Treatments[a]	pt/acre	0 to 1	1 to 2	2 to 4	4 to 6	
1. Surmount	4	84	70	52	12	35
2. Surmount	5	95	81	46	20	55
3. Grazon P & D	6	90	59	51	16	15
4. Grazon P & D	8	95	79	60	18	20
5. Tordon 22K	2	85	65	33	25	20

[a]Treatments 1 and 2 were mixtures of picloram + fluroxypyr each at 0.66 lbs ae/gal.
Treatments 3 and 4 were picloram at 0.54 lbs ae/gal + 2,4-D at 2.0 lbs ae/gal.
Treatment 5 was picloram at 2.0 lbs ae/gal.

Broadcast Treatments

Broadcast application is the most common method of applying herbicides in agricultural settings. The key message for the efficacy of broadcast treatments in eastern redcedar control is: "the shorter the tree, the better the control."

Since tree height was the most important factor influencing the level of chemical control (tree injury) with broadcast treatments, the herbicide efficacy data from a Nebraska study was categorized by tree height (*Table 1*). Recommended herbicides for trees that are up to 2 feet tall include: Surmount, Grazon P&D, and Tordon (*Table 1*). However, the same herbicides will not provide satisfactory broadcast control of trees taller than 2 feet, indicating the importance of tree height. Surmount at the rate of 5 pints per acre can also cause short-term grass injury in the form of leaf yellowing and top growth burning (*Table 1*). Estimated herbicide costs are updated annually in the *Guide for Weed Management in Nebraska* (EC130).

Individual Tree Treatments

Individual tree treatments can be applied directly to the tree foliage or to the soil around the tree base. Soil treatments can minimize the amount of herbicide used and the exposure to non-target species. However, soil treatments may not be effective unless applied before rainfall, preferably in spring or fall. Rainwater is needed to move the herbicide into the root zone, allowing uptake by a tree. Recommended herbicides for soil application around a tree base include Tordon 22K at the rate of 1 cc (ml) per every foot of tree height, and Velpar-L at 4 (cc) ml and Spike 20P at 1 cc (ml) per every inch of tree diameter. Cost of Tordon is about $85 per gallon, Velpar is about $65 per gallon and Spike 20P is about $9 per pound of product.

Individual tree foliage also can be treated with various herbicides. Based on a study conducted in northeastern Nebraska, recommended herbicides for control of 2-10 feet tall trees include Surmount at 1.5 percent volume per volume (v/v), Grazon P+D at 2.0 percent (v/v) and Tordon 22K at 1.0 percent v/v (*Table 2*).

To help you determine the volume per volume basis, note that the 1 percent v/v equals 1 gallon of the product per 100 gallons of water. For smaller backpack

Table 2. Percent of eastern redcedar and grass injury (burning) 100 days after treatments were applied to individual trees.

Treatment[a]	Dose (v/v)[b] (%)	Tree Injury (%)	Grass Injury (%)
1. Surmount	1.0	75	39
2. Surmount	1.5	89	48
3. Grazon P & D	2.0	90	50
4. Tordon 22	1.0	94	60
5. Roundup Ultra	1.0	5	55
6. Roundup Ultra	2.0	31	91

[a]Treatment 1 and 2 were mixtures of picloram + fluroxypyr each at 0.66 lbs ae/gal.
Treatment 3 was picloram at 0.54 lbs ae/gal + 2,4-D at 2.0 lbs ae/gal.
Treatment 4 was picloram at 2.0 lbs ae/gal.
Treatments 5 and 6 were glyphosate at 3.7 ae/gal
[b]Dose was a herbicide/water solution on a volume/volume basis.

Table 3. Effectiveness and costs of eastern redcedar control treatments as measured one year after treatment.

Treatment	Mortality By Height Class					To Apply Supplemental Treatments	
	0-3 ft	3-6.5 ft	6.5-10 ft (%)	>10 ft	Total[a]	Time (hours/acre)	Costs ($/acre)[b]
Fire alone	94	71	63	29	81	0.00	8
Fire+Tordon	98	95	93	60	95	0.25	262
Fire+Cutting	95	99	100	94	96	1.25	222
Tordon Alone	82	83	60	66	79	0.50	37
Cutting Alone	84	97	97	95	88	2.50	25

[a]Weighted means, based on different numbers of trees in each height class.
[b]Costs include the estimated $8 per acre fire cost.

sprayers use an equivalent of 1.3 ounces of product per every gallon of water. Apply about 1.5 ounces of the herbicide spray solution for every foot of tree height. Walk around the tree and just spray enough solution to get a glisten (shine) on the canopy surface. Solution dripping off the canopy indicates a rate that is too high and a likely waste of time and money. As an example, it was calculated that 1 gallon of spray solution could cover 15 individual trees that are 6 feet tall at a pressure of 20 psi and a single nozzle type XR8002.

Grass injury in the form of temporary yellowing and burning of top growth was evident among all treatments, especially for Tordon 22K. Roundup and other glyphosate-based products are not recommended for use in pasture settings due to poor activity on eastern redcedar and high injury level to the grass *(Table 2)*. Cost of Grazon P+D and Tordon 22 K can range from $11 to $16 per treatment.

Practical Hint for Chemical Conrtol

Use of selective herbicide treatments should be based on tree height. Broadcast treatments are effective only on short trees (up to 2 feet tall), while medium height trees (2 to 10 feet) can be controlled with individual tree treatments. For broadcast treatments use 6-8 pints of Grazon P&D or 4-5 pints of Surmount in 20 gallons of water per acre. To prepare 1 gallon of spray solution for individual tree canopy treatments, use 1.3 oz of Tordon, or 2.6 oz of Grazon P&D or 2 oz of Surmount. For larger spray tanks adjust herbicide rates accordingly.

Biological Control

Biological control is the use of natural enemies to reduce weed populations to economically acceptable levels. In the case of eastern redcedar control, goats can be used as a helpful bio-control agent *(Figure 8)* for trees that are up to 3-4 feet tall *(Figure 9)* as part of an integrated control approach. Most eastern redcedar trees less than 24 inches tall can be killed by goats in a paddock grazing system within the first year. The control level was reduced by 50 percent on 4-8 foot tall trees, however the goats managed to defoliate bottom branches and strip bark from branches and trunks up to three inches in diameter *(Figure 10)*. That size tree may take three to five years of browsing to kill.

Generally, goats are browsers with diets consisting of about 70% of non-grassy species, which indicates that they should not compete much with cattle for grass. Goats prefer non-grassy species, but they would eat grass if no other species were available. This also suggests that goats in general can help in controlling many plant species that cattle do not eat, including various noxious weeds (eg. leafy spurge, thistles).

Important factors in managing goats include the use of appropriate stocking rates, quality fencing and protection from predators. In essence, the number of goats needs to be adjusted to the amount of plant material needing control. Younger animals will not eat eastern redcedar as well as older ones. Precise stocking rates for cedar control have not been established by research in Nebraska nor elsewhere. The bottom line is that goats must be fenced in the area where unwanted plants are to be controlled. Thus, per acre stocking rate should be at least 10 goats/acre of infested land. This stocking rate with moderate eastern redcedar infestation should result in significant damage to the trees within 30 days. Higher stocking rates would be better, but will require moving the fence more often. Trees and other perennial plants have high energy reserves in their root systems and repeated defoliation over several years is required to control them. Eastern redcedar trees, however, will not resprout and if the goats remove most

Figure 8. Goats in action.

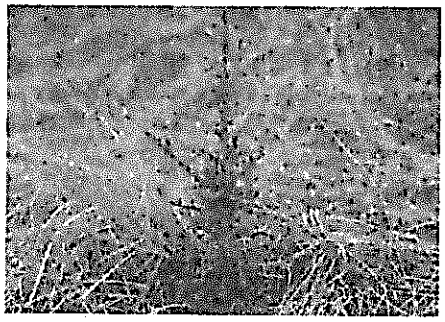


Figure 9. Goat-damaged 2-foot tall tree.

Figure 10. Goat-damaged eastern redcedar tree trunk and branches.

of the needles and/or bark, the tree will eventually die.

Close monitoring of the feed supply and the body condition of the animals is required for this method to be sustained long term. Forcing goats to eat too much of the eastern redcedar forage alone without balancing their diet would result in poor performance and even death of the animals, if taken to extremes. Also, the does (nannies) need to be in fairly good body condition in the fall to survive cold winters in Nebraska. Goats consuming a high level of eastern cedar, especially in winter, should be supplemented with high protein feed. For example, feeding 1.5 lb of good quality alfalfa hay (about 50 percent of daily intake) per 125 lb doe per day would provide good protein base. However, the body condition should be monitored and the feed adjusted accordingly.

Fencing options for goats include net wire and electric fences. One example is the use of one electrified offset steel wire (12-16 inches above ground) inside a barbed wire fence. Also, two to three strand polywire temporary fences have worked well for making smaller enclosures or paddocks.

Other issues that need to be addressed before using goats include predator control (e.g. coyotes) and perhaps learning how to raise goats for meat production. A good place to start is at the ATTRA National Sustainable Agriculture Information Service web site. The Web page "Goats: Sustainable Production Overview, Livestock Production Guide" at *www.attra.org/attra-pub/goatoverview.html* has information on numerous topics relating to meat goat production.

Costs and Effectiveness of Eastern Redcedar Treatments

Nebraska research has provided detailed information on the results and costs that can be expected when a variety of eastern redcedar control measures are applied under realistic conditions. The values in *Table 3* were generated on a site in the Loess Hills in Custer County. The eastern redcedar population on the site had developed since about 1960 and had reached a density of about 250 trees per acre. Trees were mostly less than six feet tall, indicating an expanding infestation, and were growing mostly as single trees or in small groups. Tordon 22K was applied at a rate of 4 cc (ml) per foot of tree height. It was apparent that there were some misses, and some trees were treated twice.

When herbicides are used, some form of marking should be used to prevent this. Sprinkling a few kernels of popped popcorn by each tree as it is treated is fast and inexpensive. The cutting treatments used hand tools and chain saws. Supplemental treatments were applied one to two months after the fires. Actual costs and effectiveness achieved would depend on initial tree density and fire intensity.

The main points in *Table 3* are:

1. The total costs and effectiveness for trees less than 10 feet tall are about equal for fire plus Tordon 22K and fire plus cutting.
2. Burning first reduced the time requirement by half for both Tordon 22K and cutting treatments.
3. Burning first reduced total costs by nearly half for both treatments. It should be noted that supplemental treatment is a one-time expense that can be spread over many years. This is true only if fire is used periodically to prevent reinfestation.

These costs do not include charges for changes in grazing management. For example, if grazing is reduced by 0.25 animal unit month (AUM) per acre in the year before fire to accumulate fine fuels, and an AUM's value is $24, then an additional $6 per acre should be charged to the fire cost. However, this cost likely will be recovered in reduced supplemental treatment costs if an effective fire is achieved.

The Nebraska research also indicated that treatment strategies can be modified to further reduce costs. It was reported that:

1. Some trees that at first appear to survive the prescribed fire will die the following year.
2. Surviving large trees, which make up a small percentage of an expanding population, will make a negligible contribution to future production losses unless they are female trees.
3. Herbicide rates, estimated costs of fire plus herbicide application based on these findings are reported in *Table 4*.

Availability of Labor vs. Capital

Nebraska research indicates that the costs and effectiveness of cutting and her-

bicide application are similar for trees less than 10 feet tall. However, the sources of those costs are different. Labor accounts for most of chain sawing costs. Shearing costs include purchase or rental costs of the shears plus considerable labor, or payment to a contractor. For any herbicide application, the purchase price of the herbicide accounts for most of the cost. Cutting and herbicide application both are rational choices, but managers should choose based on their own circumstances.

Summary

Since there are many different scenarios under which eastern redcedar trees grow, there is no single best weed control method for all circumstances. However, if the methods are implemented in a systematic manner, significant advances in eastern redcedar control can be achieved. There are many ways to start developing an IWM program. The easiest start will be to try one or two techniques and then add more practices as time goes on or field conditions change. Cost of control methods can also vary so choose the operation that best fits your budget.

We recommend using tree height as a determining factor for control options. There are many control options for trees that are up to 2 feet tall, including: cutting, pulling, digging, mowing, burning, use of goats and broadcast herbicide application. Trees that are 2-10 feet tall can be controlled effectively by cutting and individual tree herbicide treatments of soil or foliage. Trees that are over 10 feet in height are most effectively and economically controlled by cutting. Remember, to save time and labor expenses control redcedar trees while they are small.

Table 4. Estimated costs per acre of fire followed by Tordon 22K application under combinations of delaying treatment after fire, reducing the rate by half, and selective treatment by tree height. Costs include the estimated $8 per acre fire cost.

Treatment Option	Treatment Date	Herbicide Rate	Trees Treated	Cost
	(time after fire)	(ml/3 ft)		($/acre)
1	3 weeks	4	All	26
2	1 year	4	All	20
3	3 weeks	2	All	18
4	1 year	2	All	15
5	3 weeks	4	<10 ft	19
6	1 year	4	<10 ft	15
7	3 weeks	2	<10 ft	15
8	1 year	2	<10 ft	13

The assumptions regarding delaying treatment for one year after fire and selectively treating only smaller trees also can be made for cutting and could be expected to reduce these costs as well. A further refinement would be to focus supplemental control on seed-producing females to reduce reinfestation.

IANR

Extension is a Division of the Institute of Agriculture and Natural Resources at the University of Nebraska–Lincoln cooperating with the Counties and the United States Department of Agriculture.

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www.nefirecouncil.org - 40881 S Cottonwood Rd - Curtis, NE 69025 - 308-386-6456

Natural Resources Committee
Senator Dan Hughes, Chairman
P.O. Box 94604
Lincoln, NE 68509

Dear Natural Resources Committee,

We would like to submit this letter to the official record for LR 387 – the legislative study aimed at learning more about eastern red cedar. Nebraska Prescribed Fire Council Board Member, Sue Kirkpatrick, will be present at the hearing to read our testimony.

The Nebraska Prescribed Fire Council is a coalition of landowners and prescribed fire practitioners with over 750 members across the state and growing. The council aims to promote the safe and responsible use of prescribed fire and act as an advocate for those who currently use or want to use prescribed fire to manage their land. These objectives are realized through a series of partnerships and programs designed to help educate the public on the importance of fire, the implementation of adequate private land workshops and training, and through the practice of using safe prescribed fire techniques.

We are here today to bring to your attention the need for an increase in the use of prescribed fire across our landscape to combat the threat of the spread of eastern red cedar trees across our great state. Our membership has many reasons why they use fire on their land, from increasing forage to conserving wildlife; but the one thing virtually every member uses fire for is to control invasive woody species, especially cedar. Our members recognize the threat of cedar and also recognize the easiest and most cost-effective method of control: fire. The cedar tree is a fire-sensitive species, easily controlled through the use of fire, especially when small. It is, in fact, so fire-sensitive that the plant was considered rare prior to pioneer settlement. The reason the cedar tree was rare was because for thousands of years, periodic fires had swept across every corner of our state transforming it into one of the most iconic and beloved landscapes in the world...the Great Plains.

If you travel across our state in the months of March and April, you may have realized in recent years that there seem to be more and more smoke plumes dotting the landscape. These prescribed fires conducted by many of our members are becoming more and more frequent. Over the past few decades we have seen a significant increase in the use of prescribed fire. However, even with the increase, between state and federal agencies, private landowner groups also known as "prescribed burn associations," contractors, NRD's, and others using prescribed fire, we average less than 50,000 acres a year in Nebraska. According to historical fire cycles, this represents only a fraction of what we should be burning on an annual basis in order to maintain our prairies, wetlands, and forests.

Prescribed fire is such an incredible tool! The question might be posed, "Why aren't we using it more?" There are many reasons as to why the use of fire is riot more widespread. There are policy barriers that limit cedar control through prescribed burning. Future policy changes could further restrict landowner ability to manage their rangelands, and we feel that landowners should be a part of the decision-making process. Landowners who, by the way, have a proven high safety record comparable to any state or federal agency. The Nebraska Prescribed Fire Council is looking forward to working with the Natural Resources Committee, state senators, and state and local stakeholders in the future to identify and overcome the challenges and barriers to getting more fire on the ground.

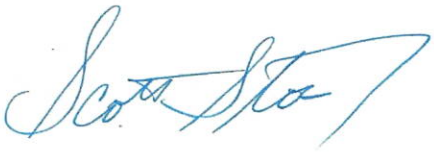
Senators, the time is now to be putting more fire on the landscape. The time is now for more landowners to act. The time is now for local, state, and federal agencies to act; before it is too late. Our organization does not want to be here in another 25 to 50 years, in front of another panel of senators being asked questions as to why we weren't burning more and why the barriers were not broken down before it was too late. Let us begin now, today, moving forward together, because this is a problem for all Nebraskans.

Will we be able to tell our children, grandchildren and future Nebraskans what we did to prevent the last parcels of prairie from being swallowed up by the eastern red cedar? Or will we have to tell them that we failed to take this opportunity to support and increase the use of

prescribed fire? What will our legacy be? As a citizen and board member of the Nebraska Prescribed Fire Council, I ask for your help to ensure the future of Nebraska's landscape.

Sincerely,

Scott Stout



President, Nebraska Prescribed Fire Council

Member, Loess Canyon Rangeland Alliance

Rancher & Landowner

Sandhills Task Force
"Where People and Land are One"

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Ben Bailey, Lakeside
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August 30, 2018

Natural Resources Committee
Senator Dan Hughes, Chairman
P.O. Box 94604
Lincoln, NE 68509

Dear Natural Resources Committee,

We would like to submit this letter to the official record for LR 387 – the legislative study passed in effort to learn more about eastern red cedar. I will also be in attendance to read our testimony at the hearing.

The Sandhills Task Force was formed 25 years ago with a goal of enhancing the Sandhill wetland-grassland ecosystem in a way that sustains profitable private ranching, wildlife and vegetative diversity, and associated water supplies. We have accomplished that through partnering with Sandhill ranchers and conservation organizations and agencies to implement practices and management plans that address resource concerns which include eastern red cedar invasion and many other issues. We also host meetings, tours, and trainings to help educate ranchers and the general public about the Sandhills, resource concerns, successful ranching practices, wildlife and birds, and rangeland management. In recent years, the majority of our projects address cedar invasion and the main topic of our outreach efforts revolve around controlling cedars.

The Sandhills of Nebraska comprises one of the largest contiguous tracts of grassland remaining in the United States. We believe that eastern red cedar invasion is a major threat to the Sandhills ecosystem and rangelands throughout Nebraska. Rangelands cover 50% of Nebraska as a whole and cedars are invading these rangelands at an alarming rate. Ranchers and landowners depend on grazing forage as their main source of income on those acres and it requires careful management to create a profit. When cedars invade pastureland, they displace all other species in their canopy because nothing can grow under them and cattle do not graze cedar trees, so the invasion has a direct negative impact on available forage. Once cedars invade and nothing is done to control the invasion, ranchers can either decrease the number of cattle or shorten the time that they are in the pasture, or they can keep stocking rates the same as they were before the invasion which leads to overgrazing. Overgrazing allows the rancher to maintain their income for a couple years, but it mines the rangeland resource which in

the long-run will reduce the total forage production, reduce the wildlife habitat, increase erosion from wind and water, and reduce the ability for the land to withstand drought.

My husband and I are ranchers and I've had the opportunity to work with many other ranchers all across the Sandhills to help them deal with their cedar invasion as well as their grazing management, so I am comfortable putting numbers to the cedar invasion impact on ranchers. Sandhills rangeland that produces 1800 pounds of forage annually has been receiving a grazing lease of $30 per acre. The property taxes are around $6 per acre in Lincoln County for upland pasture. The remaining money is used to pay the mortgage with a little left over to cover labor costs, overhead, and a small profit. If cedars have 10% canopy and the rancher reduces their stocking rate appropriately, the income would be reduced by $3 - $5 per acre which, in most situations, makes it so you can not make any money grazing cattle. What's more disturbing is the cedars will not remain at 10% canopy. Left untreated, they will exponentially increase their coverage.

Cedar invasion reduces income for ranches, but it also causes problems with accessing the property, checking cattle for illness, gathering and moving cattle, erosion, lack of plant diversity, and impaired wildlife and bird habitat.

Ranchers have relied on established cedar windbreaks to protect livestock for decades. When cedars are in the right spot, they provide excellent protection. The need for livestock protection has not gone away, but we need to be mindful of what options exist. There are alternatives to a cedar windbreaks and conservationists across the state need to be well versed in what they are. If a rancher decides to plant cedars, it would be my hope that they clearly understand that windbreak will require maintenance in the future.

Thank you for taking the time to learn about how cedars are impacting Nebraska. The Sandhills Task Force is actively waging war against their invasion and we are willing to help you ensure that property rights are not negatively impacted by policy that may be proposed in the future.

Sincerely,

Shelly Kelly

Shelly Kelly
Program Director

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Lincoln, NE 68508

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Nebraska's Natural Resources Districts
www.nrdnet.org
Protecting Lives • Protecting Property • Protecting the Future

August 31, 2018

Senator Hughes and Members of the Natural Resources Committee:

My name is Dean Edson, Executive Director of the Nebraska Association of Resources Districts presenting comments today on LR 397, the Eastern Red Cedar issue.

I want to thank Senator Hughes and members of the committee for taking time to learn more about this issue.

I am only going to provide a summary of policies on Eastern Red Cedar from the 23 natural resources districts (NRDs). Following me, you will hear from individual NRDs on their specific policies and unique management approaches.

Each NRD sets a policy that works for the local area. There are areas of the state where it is a problem and other areas that it is not.

The focus is on proper management. Education and resource materials are provided to landowners through various venues. Some districts hire foresters and/or work directly with the regional Nebraska Forest Service to provide educational materials and management practices.

Policies will range from cost-sharing for planting cedar to no cost share. Some will provide cost share for removal, either manual or through prescribed burn. It just depends on the needs and desires of the local landowners.

The most important part of management is the duty of the landowner to actively be involved in management. The local NRD cannot take that responsibility.

In closing, we ask the committee to continue to allow the NRDs to provide management options to landowners, whether that be cost share for planting or removal.

Respectfully,

Dean E. Edson

LR 387

Curtis Gotschall
87142 470 Ave
Stuart NE. 68780
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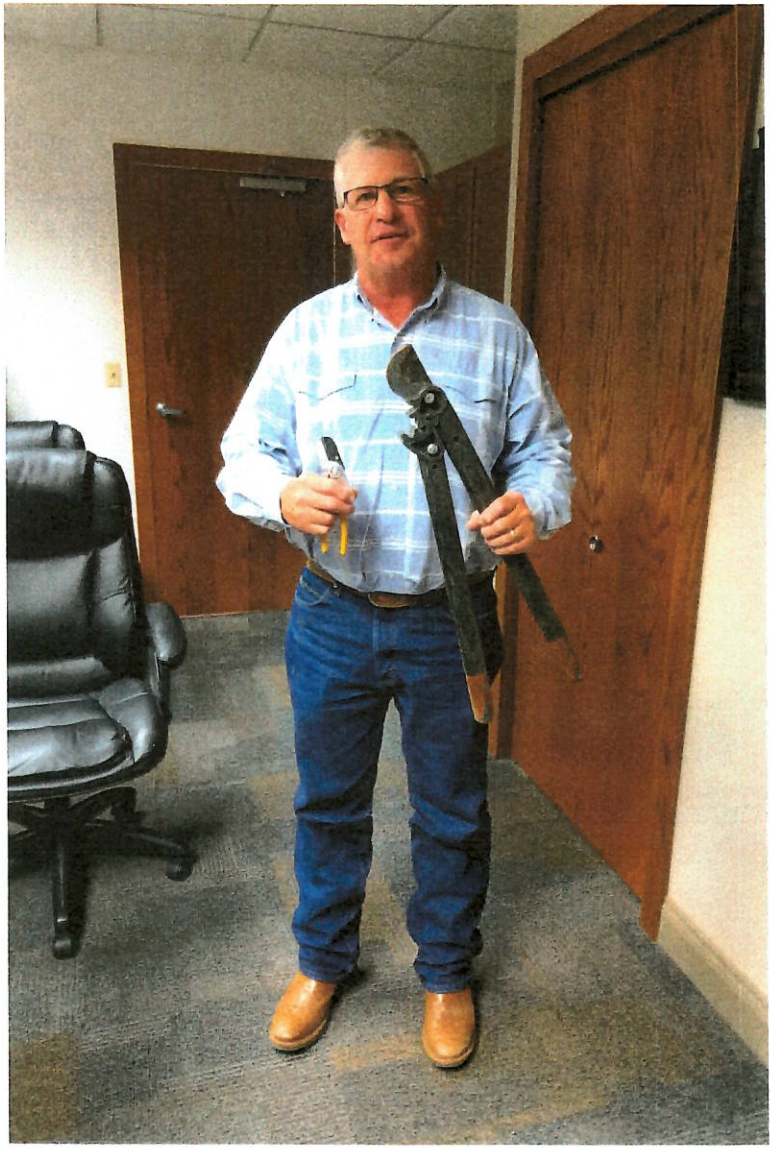
Upper Elkhorn NRD



Upper Elkhorn Natural Resources District

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9

August 31, 2018

Natural Resources Committee: Chairman Senator Dan Hughes, Senator Joni Albrecht, Senator Bruce Bostelman, Senator Suzanne Geist, Senator Rick Kolowski, Senator John McCollister, Senator Dan Quick and Senator Lynne Walz

Testimony presented by: Dennis Schueth General Manager of Upper Elkhorn NRD

LR387
Chairman Hughes and other Committee Members;

On behalf of the Upper Elkhorn Board of Directors I would like to inform the committee about our thoughts on the eastern red cedar (ERC) issue. The Upper Elkhorn NRD believes that the ERC plays a valuable role in a well-planned windbreak. I am including charts of UENRD tree sales for your review. Average tree seedlings ordered during this time period is approximately 85,000 trees and approximately 38,500 (or 45%) of the trees ordered are ERC. The last five year average of machine/hand plants of ERC is approximately 25,000.

Total tree sales have been on a downward trend in the Upper Elkhorn NRD since 2002. The majority of the trees that are planted are for various windbreaks such as livestock, field and home protection or wildlife habitat plantings. Approximately 70% of the real estate in the Upper Elkhorn NRD is rangeland or pastureland and livestock production is a vital part of the economy for the district. To be a successful livestock producer in Nebraska, windbreaks are a necessity against Nebraska's cold-windy- snowy winters.

ERC is the tree of choice by the livestock producers in our NRD for many reasons; survivability is usually in the 80 to 90% rate after planting, adaptable to various soil types, winter hardy and grows fast for a quick shelterbelt establishment. If this species is not managed properly by the landowner these characteristics can be troublesome.

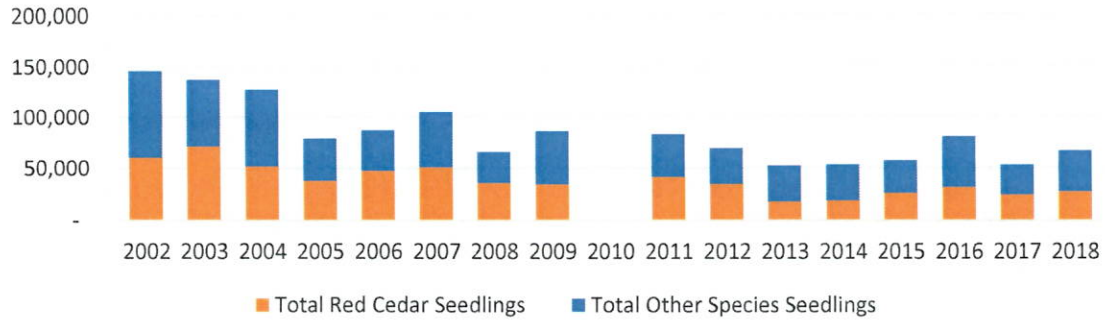
The Upper Elkhorn NRD will assist producers in their windbreak design and discuss the positives and negatives of the tree species for a particular windbreak. Due to the characteristics of the ERC, the majority of the producers prefer to have them as part of their multi-species or maybe two row windbreak. There is no other tree that the district can offer that is as durable as the ERC.

The Upper Elkhorn NRD does provide costshare to producers on all tree species and that does include the ERC. The Upper Elkhorn NRD will not costshare on the removal of volunteer cedar trees. The board feels it is the responsibility of the landowner to bear that cost. If that landowner allowed ERC to become a problem, why should taxpayers have to pay for their poor management?

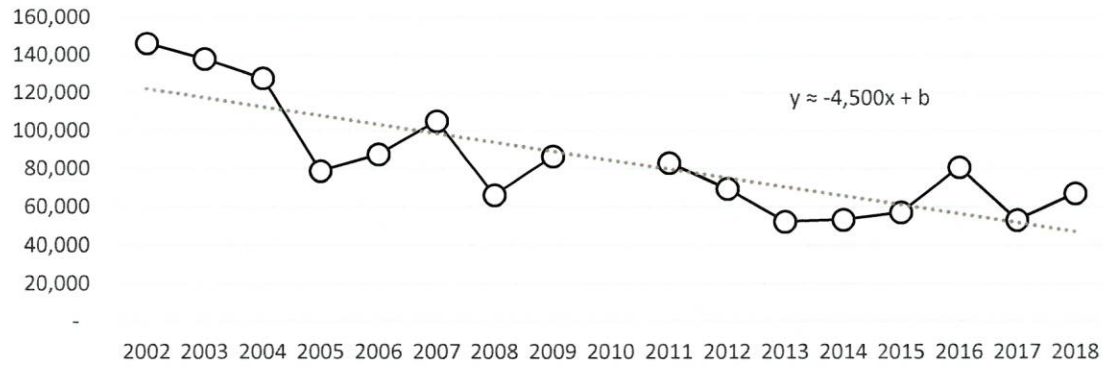
Potted Ponderosa Pine is being promoted as an option to replace the ERC. Ponderosa pine does not have the characteristics as the ERC. End cost to the producer is going to be higher, handling and storage of potted trees is more difficult for the district. For some reason that ERC is not a viable tree species anymore and we substitute them with potted Ponderosa Pine, the district will have to figure out another way to get trees to the job site and probably have to expand our tree cooler at a cost to taxpayers.

Stating all of this, the Upper Elkhorn NRD hopes that the ERC will continue to be a viable tree species to be offered for various windbreaks. Information and Education plays an important role when designing and planting a windbreak. Just as equally important is getting landowners to eliminate volunteer ERC early on. Economically it is a lot cheaper to manage them when they are small then when they are 2 feet or larger in size. ERC that are not in a designed windbreak did not get to be 10 feet tall in one year, it probably took 8-10 years of no landowner management to get to that size.

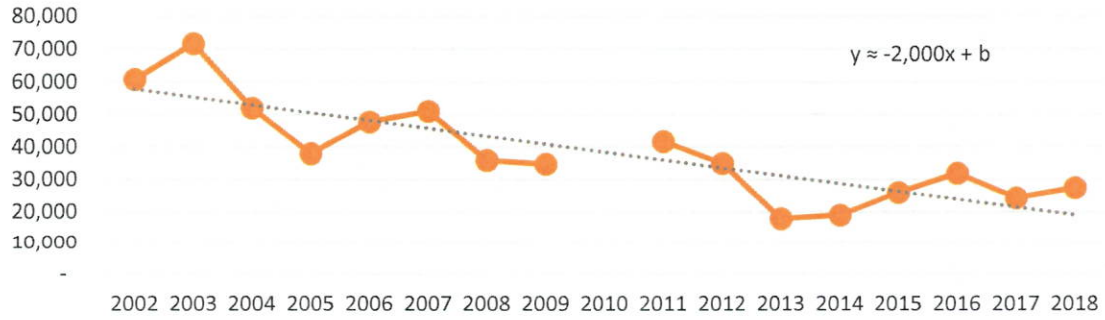
Upper Elkhorn NRD Tree Sales



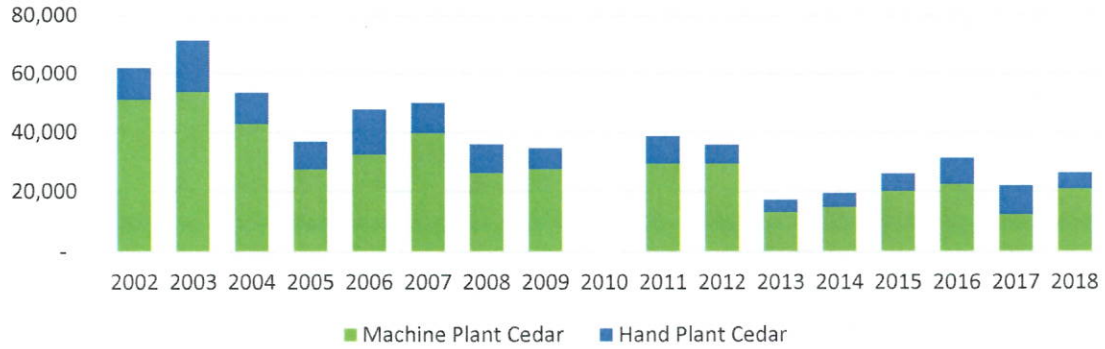
Total Seedlings Ordered



Total Red Cedars Ordered



Machine vs. Hand Plant Red Cedars



LOWER NIOBRARA
NATURAL RESOURCES DISTRICT

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August 31, 2018

Senator Dan Hughes, Chairman
Natural Resources Committee
Room1210

RE: LR 387

Senator Hughes and Members of the Natural Resource Committee

Thank you for the opportunity to share some thoughts on Eastern Red Cedar (ERC) from the Lower Niobrara NRD. Yes, there are places were ERC should not be planted and Yes there are places were ERC are a real problem. To be honest with ourselves we have to ask why are they a problem, is it because they are introduced species to this area like leafy spurge or purple loosestrife. That answer is NO. They are native to this area of the US and have been here since creation.

Ok, with knowing this tree is native and have been here since long before this country was settled by us non-native people, we have to ask ourselves why now are ERC such a problem? The native Americans must have known how to manage ERC because if the number of acres of ERC spread are correct this entire area would already be a forest. We just need to look back in history and the accounts of the pioneers. Grass was six feet tall and dry and fires were either caused by nature or the Native Americans would burn across the prairie so there would be new growth for the bison. These fires keep the ERC at bay.

I have had producers tell me at one time he did not consider ERC as the problem. He seen them in the pasture but did not equate that to the loss of pasture production because of ERC encroaching. He would just buy or rent another pasture to meet his needs. Today this is not an option and he is now spending thousands of dollars to clear ERC. He now realizes if he would have spent a little time and a few dollars then, he could have saved himself thousands of dollars and a lot of time now. With this all said the current ERC problem comes down to one word "MANAGEMENT" or the lack there of. If you ask someone who just received thousands of dollars of cost-share to remove ERC, "how much are you going to budget to maintain this area" the answers is usually "what".

The Lower Niobrara still offers ERC. Our numbers of trees planted continue to go down and of the 30,000 trees we sell each year less than a ¼ are ERC. We promote the right tree for the right place and encourage our customer to diversify their windbreaks. We support the efforts to fine a suitable replacement for ERC and will utilize when one is found.

I also provided the Committee with a white paper from the National Forest Service at Halsey which outlines their efforts.

Thank you for your time and I will be happy to answer any questions.

Terry Julesgard
LNNRD General Manager

Upper Loup
Natural Resources District

39252 Highway 2 Thedford, NE 69166
Phone 308-645-2250 Fax 308-645-2308
www.upperloupnrd.org
ulnrd@upperloupnrd.org

Protecting Lives, Protecting Property, Protecting the Future

August 20, 2018

RE: LR 387

Dear Senator Hughs,

This letter is to show our support in the legislature investigating the eastern red cedar (ERC) and the factors and impacts it is having statewide.

The Upper Loup Natural Resources District (ULNRD) is located in the Sandhills of Nebraska and contains 4,275,000 acres which is over 90% grassland. There is no doubt that the eastern redcedar is a tough and hardy native tree species, that is expanding across much of the state, in part due to its adaptability to a wide range of conditions. Due to its hardiness and adaptability it has been one of the few species that does well in the Sand hills.

Since the mid-seventies the cedar is one of the few tree species that will actually do well in our sandy soils and provide the needed windbreak protection to producer livestock. To date there has been no quantifiable loss of wildlife, critical habitat or economic loss due to the ERC within our ULNRD boundaries. We understand that this is not the case across the state. Because of this, our Directors believe the cedar concerns would be best managed locally. Our State is so diverse and we feel that there is not a one size fits all when it comes to the ERC issues.

Locally, the Upper Loup has taken several proactive steps in regards to ERC control. For instance, we offer cost-share for a variety of brush management practices to producers such as biological, mechanical, chemical and prescribed burns. We no longer provide cost-share to producers on purchasing or planting cedars. Because many of our producers still like the species because it does do well in our soils we will still sell them, but just not provide cost-share or planting services. We also a partnered with a local RC&D to purchase a tree shear to be used to help remove and manage cedars.

Sincerely,

Anna Baum

Anna Baum, General Manager Upper Loup NRD

Nebraska National Forests and Grasslands
Bessey Nursery
Eastern Red Cedar White Paper

Back Ground:

Eastern Red Cedar (*Juniperus virginiana*) is a native tree to the United States. Its native range is from Canada to Florida and from the Central US, Nebraska to the East Coast. It is a highly valued windbreak species since it is drought resistant, very few pests successfully attack it, and survival rate is very high in most years. The Bessey Nursery has produced Eastern Red Cedar since the start of the nursery in 1902 and it has been a staple species for the nursery and most conservation districts of the plains states. At a high point, Bessey Nursery was producing 1.5 to 2 million Eastern Red Cedar for the Nebraska Forest Service and Nebraska Natural Resource Districts of Nebraska. Today the nursery sells about 305,000 annually.

Total ERC Sold in 2018	
Nebraska	131,625
South Dakota	76,175
Kansas	25,025
North Dakota	500
Wyoming	50
Total	**233,375**

Historic Sales:

- All historic numbers are from the Bessey Nursery Annual Report
- Reports are from 1979 to the present
- Largest distribution years were 1979 and 1980
- Additional research will be required to find prior year reports
- By percentage at the high point ERC made up 65% of all sales
- Today it only makes up 15% of all sales

Nursery Tests:

- The Kansas NRCS Plant Material Center tried to produce Modoc Cypress (*Cupressus bakeri*), which had shown promise for them in Kansas. However, seed was hard to get and they did not survive in Nebraska.
- One Seeded Juniper (*Juniperus monosperma*) did very well in the nursery field; however, it did not transplant well.
- Multiple other species were tested and none performed well.

- In 2012, we tested the Male Eastern Red Cedar (*Juniperus virginiana* "Burkii"), see some information at http://hort.ifas.ufl.edu/database/documents/pdf/tree_fact_sheets/junvirb.pdf. We were not able to contact any of the individuals listed on the document. We ordered 300 plants from a nursery in Georgia and when they arrived over half of the plants had fruit on them. The Nursery Manager in Georgia told us that they were the male selection. Almost all of the test plants died within the first 2 years, due to winter hardiness.
- The Bessey Nursery started cuttings from male trees in 2012 and 2013. They would callus but very few ever produced roots, resulting in only a 1% success rate. A private tissue culture lab was contacted for an estimate on tissue culture. The cost was $5000 just to get the plants into tissue culture and they would need fresh cuttings to do so. Nevertheless, tissue culture has potential.
- In 2014, Ryan Armbrust with the Kansas Forest Service took on the challenge of improving the success of cuttings. This may be a viable option into the future if it can be replicated consistently.
- In 2015, the nursery started growing container test trees for the Nebraska State Forest Service to try to increase survival rates of our native Ponderosa Pine. Multiple container sizes were tested. The limiting factor for Bessey is the lack of Greenhouse space however to help facilitate testing some USFS requests were moved to another nursery.
- Nebraska Forest Service is planting and testing 180,000 Ponderosa Pine, 10,000 Limber Pine, and 10,000 Southwestern White Pine seedlings in 2018 and 2019.
- Grafting is a viable option, the same is done with the Taylor Juniper.

Alternative Species: Please contact your local NRD, Nebraska Forest Service, Nebraska Statewide Arboretum, or Garden center for additional options.

Rocky Mountain Juniper	Juniperus scopulorum
Ponderosa Pine	Pinus ponderosa
Jack Pine	Pinus banksiana
South Western White Pine	Pinus strobiformis

http://www.nrdtrees.org/trees_list.php

Testimony by Russell Callan General Manager Lower Loup NRD 8/31/2018

Hello Senator Hughes and committee members! My name is Russell Callan (Spell) I am the General Manager of the Lower Loup Natural Resources District. I appreciate the opportunity to testify today. As you know the Lower Loup NRD has been planting conservation trees since its creation in 1972. The conservation tree program is a very important tool used in soil conservation, livestock and farmstead windbreaks, wildlife habitat, and general quality of life.

One of the components of the program has been the planting of Easter Red Cedar trees for their valuable contribution to windbreak functionality. The design and planting of windbreaks is based on several factors including, what is the intended use of the windbreak, where is the windbreak located as it relates to soil types, land use, rainfall, and species of tree that preforms will in that region. And let us not forget to consider the species of tree that the landowner wants in their windbreak.

The Eastern Red Cedar is a native species that has limited diseases and has been growing well in this environment far longer than any of us have been here. However; Ill use the analogy that a Cedar in the windbreak is a great assist, but a cedar in the wrong place is a weed. With that being said, the determination of whether or not that cedar is in the wrong place is in the eye of the beholder, and depends on the intended purpose of the tree, and the intended purpose of the piece of property that has the cedar trees growing on it. That intended purpose can range from production of forestry products, wildlife and hunting opportunities, and a combination of all of that in conjunction with livestock production. What we do know is that in certain areas cedars can spread and if left unmanaged may mature to an unacceptable level. We also know that a cedar windbreak located in the correct spot is an asset. There are multiple tools out there to help us manage and control the spread of cedars. The method of control, and level of control is again based on the intended purpose of the trees and the property and should be the decision of that landowner. I would be glad to answer any questions.

14

The Nature Conservancy

August 31, 2018
Senator Dan Hughes, Chairperson
Natural Resources Committee
Nebraska Legislature

Re: LR387 Interim study to examine issues relating to the spread of Eastern Redcedar

Mr. Chairperson and Respected Members of this committee—

On behalf of the 4,330-member households of the Nature Conservancy in Nebraska (TNC), I am offering written testimony in support of the activities of LR387. It is my hope that with the information gathered through the committee's analysis, the legislature will move quickly from assessment and understanding to action to help mitigate the ecological and social costs eastern red cedar (ERC) expansion poses to Nebraskans.

Priority actions needed to combat eastern red cedar expansion include:

- Identification and matching of priority areas with expanded cost-sharing and technical assistance programs. This is a wicked problem no single agency is equipped to address. Existing funding streams are inadequate to the task, as indicated by the estimated $15 million required to clear 25,000 acres annually to maintain existing grassland, simply to stay even. Coordinated action among partners is necessary to ensure highest need areas are cleared first.
- Support sustained prevention, fighting (wild)fire with (prescribed) fire. Prescribed burns are the most cost-effective way to remove cedar, and areas cleared of red cedar by previous prescribed fire treatments abate the spread of wildfire. Consider prevention also by addressing the propagation and spread of eastern red cedar at the point of sale.

For those unfamiliar with our organization, The Nature Conservancy is a leading conservation organization working around the world to protect ecologically important lands and waters for nature and people. We have worked in Nebraska for nearly 50 years, and we currently own and manage over 66,000 acres of land in the form of nature preserves and working ranches.

All aspects of the ERC issue—increased threat of wildfire, reduced livestock production and revenue, declines in overall biodiversity, lost Public Schools revenue, and reduced streamflow—touch down on the Conservancy's own Niobrara Valley Preserve, a 56,000-acre grasslands and woodlands complex along the Niobrara River, none more so damaging than the decline in overall biodiversity and productivity of the land, with impacts to grassland birds, most beetle species, including the Federally Endangered American burying beetle, and small mammal species. Unfortunately, it was a

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nature.org/nebraska

catastrophic wildfire in 2012 that gave us an unexpected toehold in removing cedar from our woodlands.

The 2012 Fairfield wildfire burned 46 square miles of the preserve—an area half the size of the City of Lincoln—resulting in $3.2 million in negative impacts overall for the state, and significant lost income to TNC from grazing leases and 60 miles of replaced fence line. Nonetheless, a good demonstration opportunity came out of the fire: areas where spring burns were conducted did not burn the way untreated areas did, and in fact, those segments lessened the spread of wildfire.

Already a conservation management priority, the 2012 fire catalyzed renewed focus on cedar clearing. Between 2014 and 2017, TNC leveraged $750K in federal, state, and private funding, not including staff costs, to support cedar control on the preserve, mechanically clearing upwards of 1,400 acres.

Cleared acres are maintained primarily though prescribed fire. Prescribed fire is also the most cost-effective means to address new cedar growth. Since 2012, TNC has significantly expanded its Fire Training Exchange to meet shared wildlife resource and landowner and rancher objectives on the preserve and adjacent public and private lands. With support from the Nebraska Environmental Trust, the Nebraska Forest Service, the Nebraska Game and Parks, and Pheasants Forever, the preserve recently added a burn boss to expand our role in the region, targeting 7,500 acres annually on non-TNC lands. Cedar clearing through this program will be achieved at $30 - $40 an acre.

While we have been able to garner crucial resources from a multitude of partners to make significant strides, much work remains. Mechanical clearing targets include an additional 12,000 upland acres and 1,600 riparian acres to restore our grasslands and woodlands, respectively. At an average cost of $600 an acre, this represents an estimated $8.2 million investment to address the problem on preserve alone.

The gap filled through the efforts described above are temporary, contingent on continued funding and increasingly higher stakes. The burn boss position is funded for only two years, and funding support for the fire training exchange and mechanical clearing is by no means certain or ongoing. Without corollary policy development in prevention, expanded use of prescribed fire, and further investments in cost-sharing, these efforts may not add up in the long term.

Now is the time to connect the dots of all the cedar control efforts currently underway with conservation agencies and landowners across the state. Individual efforts are simply not accruing fast enough or at a large enough scale to address the problem. Comprehensive, statewide coordination is needed to get to scale and more efficiently deploy the resources of public and private actors.

Thank you for your consideration of our testimony.

Sincerely,

Rich Walters, Director of Stewardship
Katie Torpy Carroll, External Affairs Coordinator

Good afternoon Senators, members of the Natural Resource Committee and Chairmen Hughes. My name is John Erixson, I am Director of the Nebraska Forest Service (NFS) and the Nebraska State Forester. I am speaking on my own accord and not on the behalf of the University of Nebraska and I will be testifying in a neutral position.

Eastern Red Cedar (ERC) is a native tree to Nebraska. By definition "native" determines it cannot be labeled as an invasive species. Eastern Red Cedar is a species we have seen increase in population in several portions of the state. In 1972, approximately 25,000 acres were considered ERC forests in Nebraska. Today, inventory data shows slightly over 330,000 acres of red cedar forests.

Figure 1: Acres of Eastern Red Cedar by Forest Type and Total Acres by Year (2009-2017)

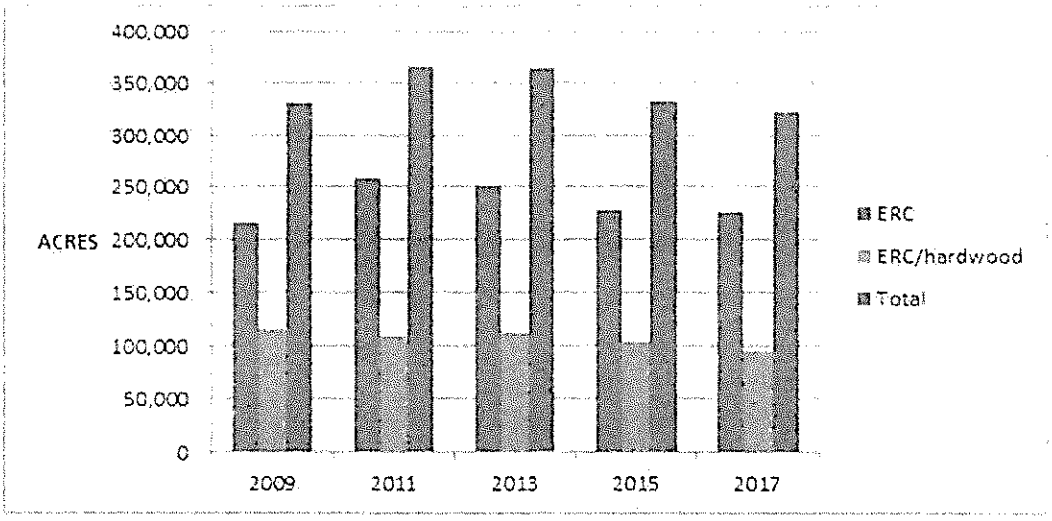


Figure 1: ERC acres over time by forest type (Data Source: USDA Forest Service Forest Inventory Analysis 2018)

A breakdown of the ERC population in the state shows we have approximately 245,000 acres of persistent ERC forests (Figure 3 and 4). These areas have been and remain forest for the past few forest inventory cycles, which occur every five years.

Since 2012, we've seen an overall reduction in existing cedar forests by more than 90,000 acres; however during that same timeframe, we have also seen 60,000 acres of new cedar forests established. So while we are seeing new acres established, Nebraska's landowners, organizations, and natural resource agencies are having an impact in the form of a net loss over that last five years. We still have a long way to go.

Net Change in Classification by Land Use

- Other Forest increased by 5,594 acres (28,754 acres treated – no longer ERC dominated, 34,348 acres new ERC established)
- Non-Forest decrease by 19,975 acres (19,975 acres treated – no longer ERC dominated, zero acres of new ERC established)
- Agricultural land decreased by 19,925 (36,216 acres treated – no longer ERC dominated, 16,291 acres of new ERC established)

- Range land Increased by 1,063 acres (7,846 acres treated – no longer ERC dominated, 8,909 acres of new ERC established)

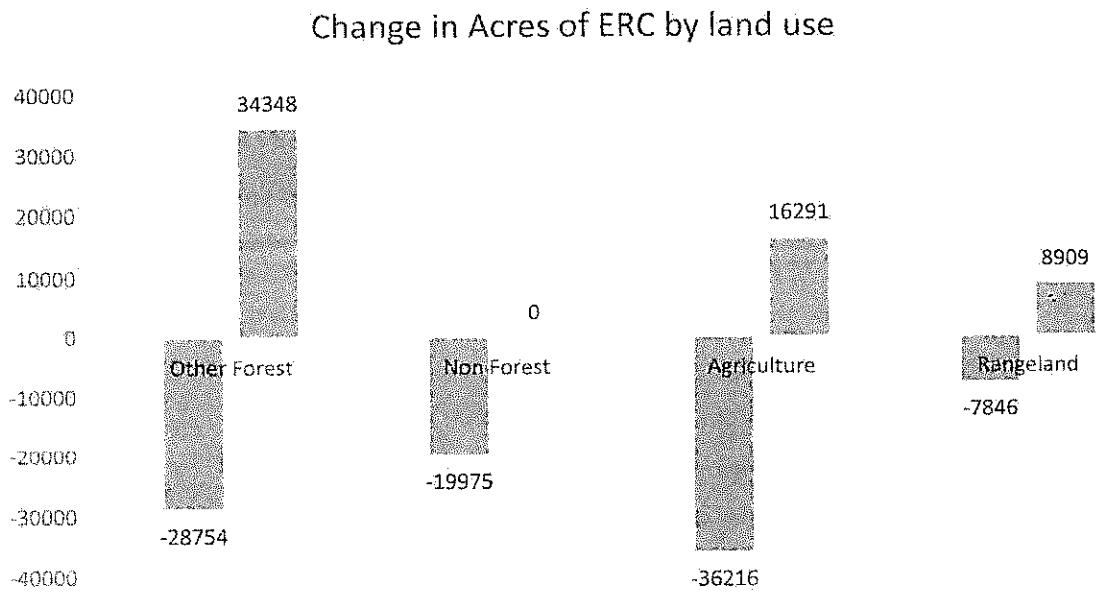


Figure 2: Table shows acres treated in blue from ERC back to traditional land use; orange shows new acres dominated by ERC since 2011 (Data Source: USDA Forest Service Forest Inventory Analysis 2018)

The uncontrolled spread of Eastern Red Cedar into grasslands has several negative impacts from an ecological and environmental standpoint, as well as from an economic standpoint. Cedar often grows as wide as it grows tall, occupying space and outcompeting other native vegetation. This results in less grass being available for grazing animals and for nesting wildlife. Across Nebraska, it is easy to find examples of areas where rangelands once spanned the horizon, but now ERC dominates the landscape.

In our forests, ERC often grows in the shade of both deciduous and pine trees, resulting in changing the function of these forests. When ERC occupies the understory of these stands our forests change. In many of our forests we no longer see small pine or cottonwoods regenerate. Without this regeneration of our desired plant community, in both cases, ERC will become the dominant species and we will lose these forests.

ERC must also be recognized for the benefits, in the form of windbreaks and forest products for wood manufacturers. In western Nebraska, west of the 100th meridian, ERC is one of the few tree species that survives, and is still today a tool land managers use for windbreaks. In my recent travels in Kimball County, ERC is a common windbreak species. Many, perhaps most, new windbreaks have one to three rows of ERC. In my discussions with local managers, ERC is used primarily because it is the only or best tool in the tool box: survives well, grows fast and does not spread naturally west of the 100th meridian. ERC, provides landowners the shelter they need from the wind around farmsteads, and protects livestock from the elements.

The Nebraska Forest Service is currently sampling windbreaks and shelterbelts in Nebraska as part of a greater effort to characterize all windbreaks and shelterbelts across the Great Plains. This includes a census of all windbreaks and shelterbelts found in ND, SD, NE, and KS. As part of this effort, NFS has randomly sampled 1102 windbreaks/shelterbelts across the state, with some in each of our 93 counties. In this sample, 70% of the windbreaks have a significant component of ERC or ERC would be considered the dominant species. ERC is an important tree species for Nebraska for this reason.

The Nebraska Forest Service provides cost share to landowners to assist with the management of forest lands. As part of the effort, landowners work with NFS staff and other natural resource professionals to remove encroaching cedar from hardwood/pine forests, manage ERC stands for future forest products, remove ERC for fuels to reduce wildfire risk, and to improve rangelands.

In conclusion, ERC is an important tree for Nebraska that must be managed. As natural resource professionals, we have a responsibility to utilize all of the tools available to manage this expanding native species in our landscape. This must include prescribed burning, mechanical treatments, and harvesting timber for economic gain.

Thank you for your time, I would be happy to answer any questions.

Additional Information

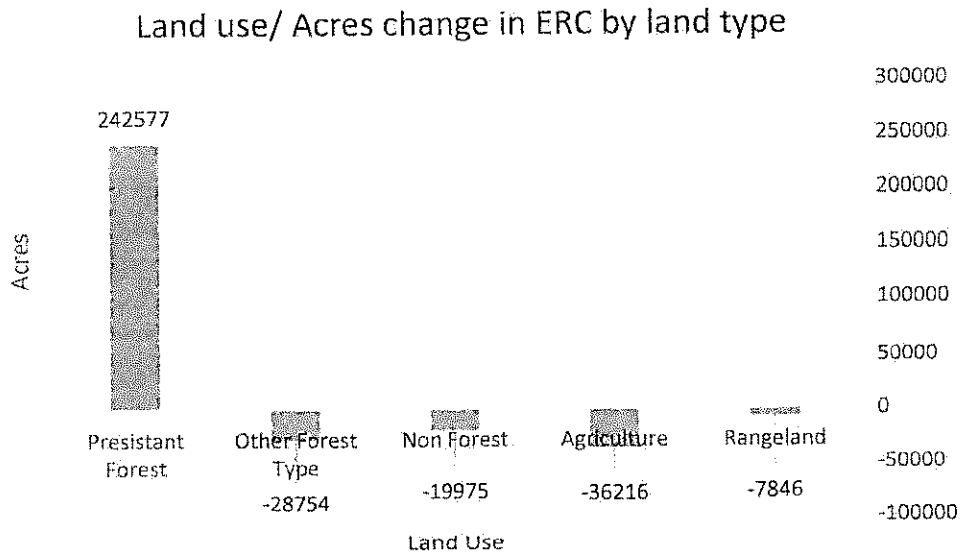


Figure 3: *shows data from the USDA Forest Service FIA plots in Nebraska. Data indicates ERC forested acres have remained persistent at 242,577 acres, while 92,791 acres have changed back to traditional uses.*

While this trend is good, this is only part of the story. Figure 3 shows the change in other acres of land to ERC forests or lands dominated by ERC. Change from conventional or traditional uses, net gain is 59,547 acres.

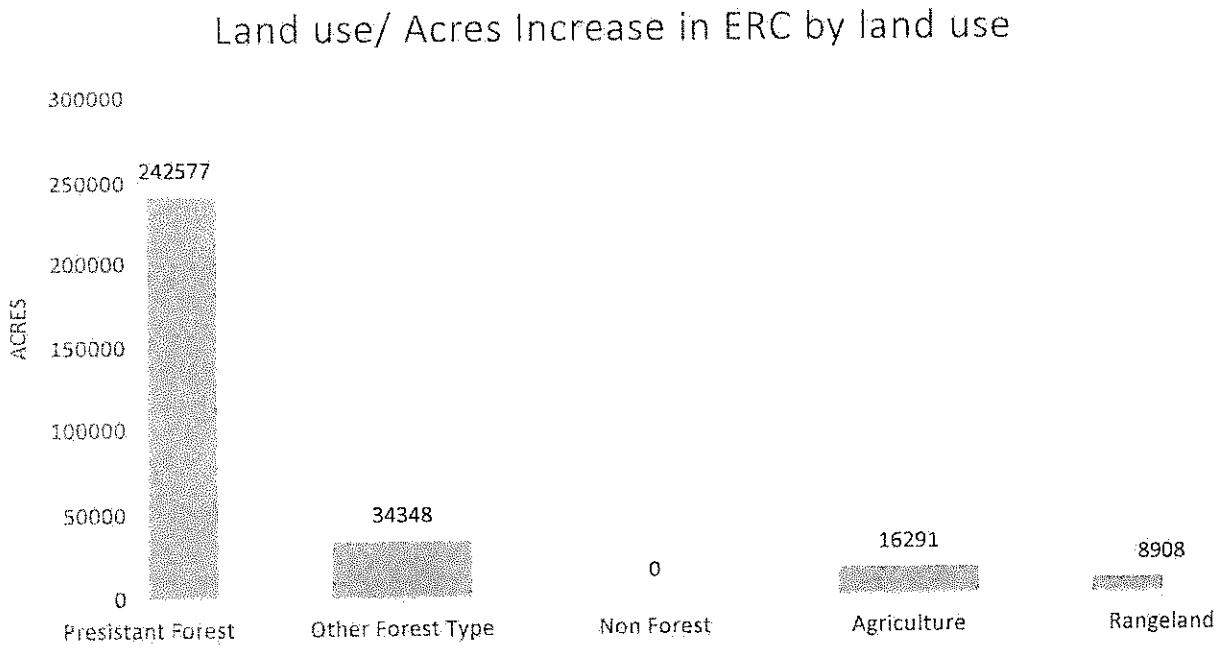


Figure 4: Net gain in ERC Acres by Land Use (note Figure 2 and 3 represent different acres) (Data Source: USDA Forest Service Forest Inventory Analysis)

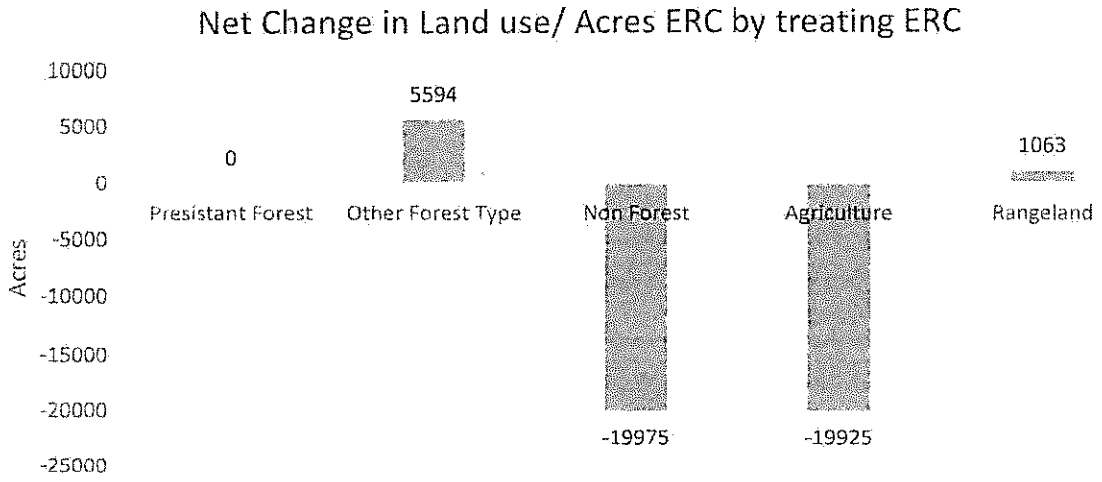


Figure 5: Net gain or loss by land use to ERC over all acre decrease is 33,000 acres (Data Source: USDA Forest Service Forest Inventory Analysis)

Note: Persistent Forest is land dominated by ERC from one inventory to the next, Other Forest is Deciduous or Pine Forest with significant ERC component, Non Forest is land with tree not meeting the definition of forest, agriculture is land traditionally used or current used for crop production, range is traditional grass lands and prairie.

An **invasive species** is an organism that causes ecological or economic harm in a new environment where it is not native. **Invasive species** can harm both the natural resources in an ecosystem as well as threaten human use of these resources. (NOAA 2018)

Invasive species are plants, animals, or pathogens that are non-native (or alien) to the ecosystem under consideration and whose introduction causes or is likely to cause harm. (USDA 2018)

Good afternoon Senators, members of the Natural Resource Committee and Chairman Hughes, my name is Matthew Holte, I serve as the Fire Operations Team Leader for the Nebraska Forest Service, and I am testifying on my own accord and not on behalf of the University of Nebraska.

I have over 20 years of experience in wildland fire and prescribed burning with the USFS and BLM. Prescribed fire can be an exceptional tool for managing the vegetation on the landscape when used correctly, and under appropriate conditions (i.e. wind, temperature, fuel moistures, and humidity). Utilizing prescribed fire in eastern red cedar stands, particularly mature stands is tricky. One of the unique fire behavior aspects of ERC is that it is a species that unless they are abnormally dry they can be used as a fire break if the conditions are right. When moisture is abundant in the soil and available to the trees, they often have a live fuel moisture in excess of 86%, which is above the point of ignition. Meaning fire managers can use ERC to stop the spread of wildfire.

This poses a significant challenge for prescribed fire managers when try to utilize fire as a tool for managing these larger, mature cedars. In order to run a fire through the larger trees, a burn boss typically relies on drier conditions or higher winds, higher temperatures, and lower humidities. This approach to burning is counterintuitive for wildland fire managers as these conditions are often the same that you would expect during wildfire conditions, where full suppression of a fire would be expected.

In contrast, using prescribed fire to manage smaller, young (1'-4' tall) cedars is a very viable and effective tool. In stands where a significant grass or fine fuel component is present, cedar is killed by fire due to the heat of the flames and individual trees torching. This type of burning is typically a cleaner approach, where many of the skeletons are consumed in the fire. The fire is carried from one tree to the next through the grass, and the heat from the fire kills and consumes the cedar tree.

In stands with larger trees or stands with many trees per acre (more than 500, limited fine fuels), another approach for prescribed burning is to do prep work before burning. Slashing a unit (laying 10-25% of the trees on the ground months prior to burning) or using other mechanical treatments prior to a prescribed burn is an effective method to increase the fuel load on the ground to carry a fire. This method provides more ground fuel to carry the fire to consume the unwanted tree while allowing for lower intensity fire and a more manageable burn.

BehavePlus is a Fire Modeling System used by Prescribed Fire managers and Burn bosses to predict how fire will act under a set of conditions. This modeling system can help provide a reasonable estimate of expected fire behavior given the particular fuel type, weather condition and terrain. BehavePlus helps the burn bosses develop the prescription for their burn or the limits of when you should burn. You are able to run multiple scenarios using various condition to understand the likely outcome prior to ignition. The burn boss utilizes this tool to set the perimeters where the burn should be controllable under all conditions. For instance maximum and minimum wind speed, humidity and temperatures are identified, rate of spread under these condition are understood prior to ignition.

TIME LAG	FUEL SIZE	DETERMINATION
1–hour	<0.25 inch diameter	Fine flashy fuels that respond quickly to weather changes. Computed from observation time temperature, humidity, and cloudiness.
10–hour	0.25 to 1 inch diameter	Computed from observation time temperature, humidity, and cloudiness. Can also be an observed value, from a standard set of fuel sticks that are weighed as part of the fire weather observation.
100–hour	1 to 3 inches diameter	Computed from 24–hour average conditions composed of day length, hours of rain, and daily temperature/humidity ranges.
1000–hour	3 to 8 inches diameter	Computed from a 7–day average conditions composed of day length, hours of rain, and daily temperature/humidity ranges.

Low Risk

In the first attached BehavePlus run, the model depicts burning under good conditions. As you can see on the low end with a 10% one hour fuel moisture (i.e. grass fuel moisture), we should expect the fire to grow at a rate of 21.6 chains (one chain is equivalent to 66 feet) per hour or 1,425 feet per hour. According to the BehavePlus run and using the charts from the Fireline handbook (fig. 1), we know that we will have flame lengths from 1' to almost 4' high and that without equipment we are able to fight fire right next to the head of a fire with flame lengths up to four feet. This burn would quickly overwhelm a firefighter or burner with only hand tools.

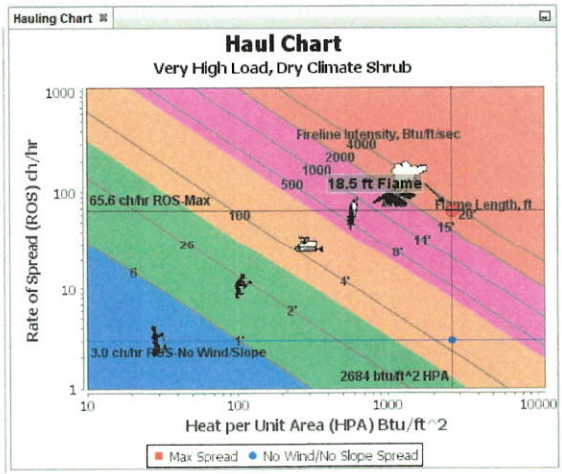


Figure 1: Haul Chart – shows expected all flame lengths

Ideally this burn would be conducted with one hour fuel moistures between 16% and 18%. The next chart in the scenario one hour fuel moistures should be between 12-18%. If you add in the variable of winds up to 15mph, this burn would be manageable.

Moderate Risk

In the second attached BehavePlus run, I kept the one hour fuel moisture constant at 10%, but also dropped the 10 hour fuel moistures to between 5% and 10 %, this is a branch up to 1 inch in diameter. I also increased the winds to 25 mph. This created a drastic increase in the rate of spread to over 10,000 feet per hour. With flame lengths of 8.5' and 12.8' equipment such as bulldozers, fire engines, or even aviation are need to control this burn.

High Risk

In the final run I kept the one hour fuel moisture at 10%, increased 10 hour fuel moistures to 10-20% and kept the winds at 25mph. This results in a rate of spread at almost 4,000 feet per hour with flame lengths from 3.8' to 8.5', a burn that is manageable with the help of equipment, but is still very unsafe for firefighters.

	Low #1	Moderate #3	High #2	Extreme #4
Fuel Model	Brush	Brush	Brush	Brush
1-Hour	10%-20%	10%	10%	5%
10-Hour	15%	10%-15%	5-10%	10%
Wind	15 mph	25 mph	25 mph	30 mph
Flame Length	1.0'-3.6'	3.6'-8.5'	3.6'-12.8'	23.0'
Rate of Spread	198'-1,425.6' ft./hr	1,425.6-5,689.2 ft./hr	1,432.2-10,645.8 ft./hr	26,327.4 ft./hr

Prescribed Fire and Training

Table 1 includes some a list of prescribed fires, along with the incurred cost to suppress the burns that escaped and were eventually converted to a wildfire. The State of Nebraska is in a unique situation, as none of the State agencies have a true suppression or prescribed fire force. Burn associations have developed to perform the burn themselves, use contractors, or rely on Volunteer Fire Departments.

There is roughly 200 hours of classroom training needed to become a qualified burnboss using the national standards. It also requires individuals to work on a position taskbook and to have competency at several other positions before initiating the Prescribed Burnboss taskbook, so it is difficult to become or to find qualified burn bosses to conduct these burn operations. In Nebraska, we have only have one National Wildfire Coordinating Group qualified burn boss, within the state agencies, which is myself.

Secondly asking the Volunteer Fire Departments to assist seems reasonable, however...

- Many of their insurance policies do not allow it
- most of the volunteers have day jobs and are not able to assist
- prescribed fire is not an emergency and with the limited staffing it could result in a delayed response for a life-threatening emergency elsewhere

Finally burning without qualification and experience is a huge risk, if something were to ever go wrong, whether it be loss of property or loss of life, the first place that an investigation would center would be over the qualifications of that burn boss, they are responsible for every person, action, and decision that happens on that burn, not to mention the additional cost of suppressing the fire. Prescribed fire is a valuable tool in addressing red cedar encroachment. However, improper use and lack of training can and

Additional Information

Prescribed Fire Burn Boss Type 2 (RXB2) (Position Category: Wildland Fire)

REQUIRED TRAINING

- Annual Fireline Safety Refresher (RT-130)
- Smoke Management Techniques (RX-410)
- Introduction to Wildland Fire Behavior Calculations (S-390)

REQUIRED EXPERIENCE Satisfactory performance as a Firing Boss,

- Single Resource (FIRB) + Satisfactory performance as an Incident Commander Type 4 (ICT4) + Completion and Certification of PTB as a Prescribed Fire Burn Boss Type 2 (RXB2) on a prescribed fire

OTHER TRAINING WHICH SUPPORTS DEVELOPMENT OF KNOWLEDGE AND SKILLS

- Fireline Leadership (L-380)
- Introduction to Fire Effects (RX-310)
- Prescribed Fire Burn Plan Preparation (RX-341)
- Prescribed Fire Implementation (RX-301)

Persons Qualified Summary

Position Code	Hazard Type	Position Description
RXB2	RX	Prescribed Fire Burn Boss 2

Persons Job Qualified

Total Persons Qualified =	1
Total Persons Invalid Refresher Training =	1
Total Persons Invalid Fitness =	0
Total Persons Qualification Expired =	0
Total Persons Missing Position Priority =	0

Persons Trainee Qualified

Total Persons Trainee Qualified =	0
Total Persons Invalid Refresher Training =	0
Total Persons Invalid Fitness =	0
Total Persons Qualification Expired =	0
Total Persons Missing Position Priority =	0

Persons Skill Qualified

Total Persons Skill Qualified =	0
Total Persons Invalid Refresher Training =	0
Total Persons Invalid Fitness =	0
Total Persons Qualification Expired =	0
Total Persons Missing Position Priority =	0

Inputs: SURFACE

Description		ERC #1
Fuel/Vegetation, Surface/Understory		
Fuel Model		5
Fuel Moisture		
1-h Fuel Moisture	%	10, 12, 14, 16, 18, 20
10-h Fuel Moisture	%	15
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	100, 104, 108, 112, 116, 120
Weather		
Midflame Wind Speed (upslope)	mi/h	15
Terrain		
Slope Steepness	%	0

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].
Fire spread is in the HEADING direction only [SURFACE].
Wind is blowing upslope [SURFACE].
Wind and spread directions are degrees clockwise from upslope [SURFACE].
Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Output Variables

Surface Fire Rate of Spread (ch/h) [SURFACE]
Surface Fire Flame Length (ft) [SURFACE]

Notes

ERC #1

Head Fire

Surface Fire Rate of Spread (ch/h)

1-h Fuel Moisture %	Live Woody Fuel Moisture %					
	100	104	108	112	116	120
10	21.6	21.0	20.5	20.0	19.5	19.0
12	19.8	19.3	18.8	18.3	17.9	17.4
14	16.2	15.7	15.3	14.9	14.6	14.2
16	10.1	9.9	9.6	9.4	9.1	8.9
18	3.4	3.3	3.2	3.1	3.0	3.0
20	0.0	0.0	0.0	0.0	0.0	0.0

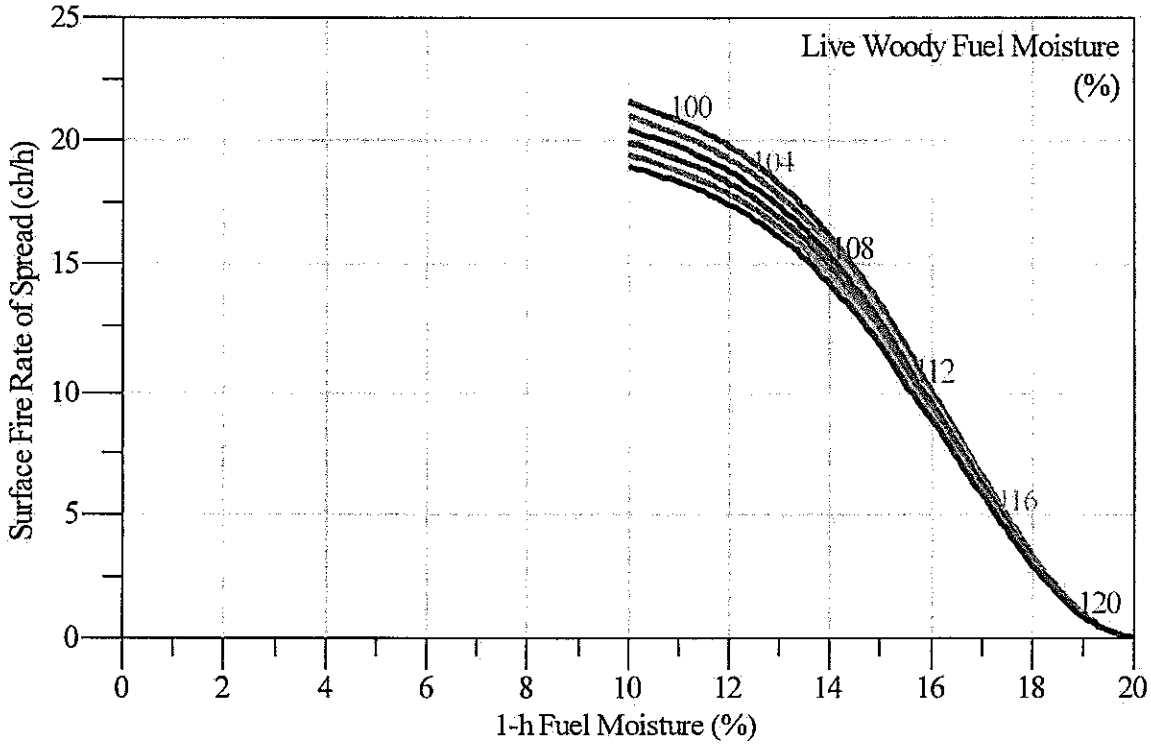
ERC #1

Head Fire

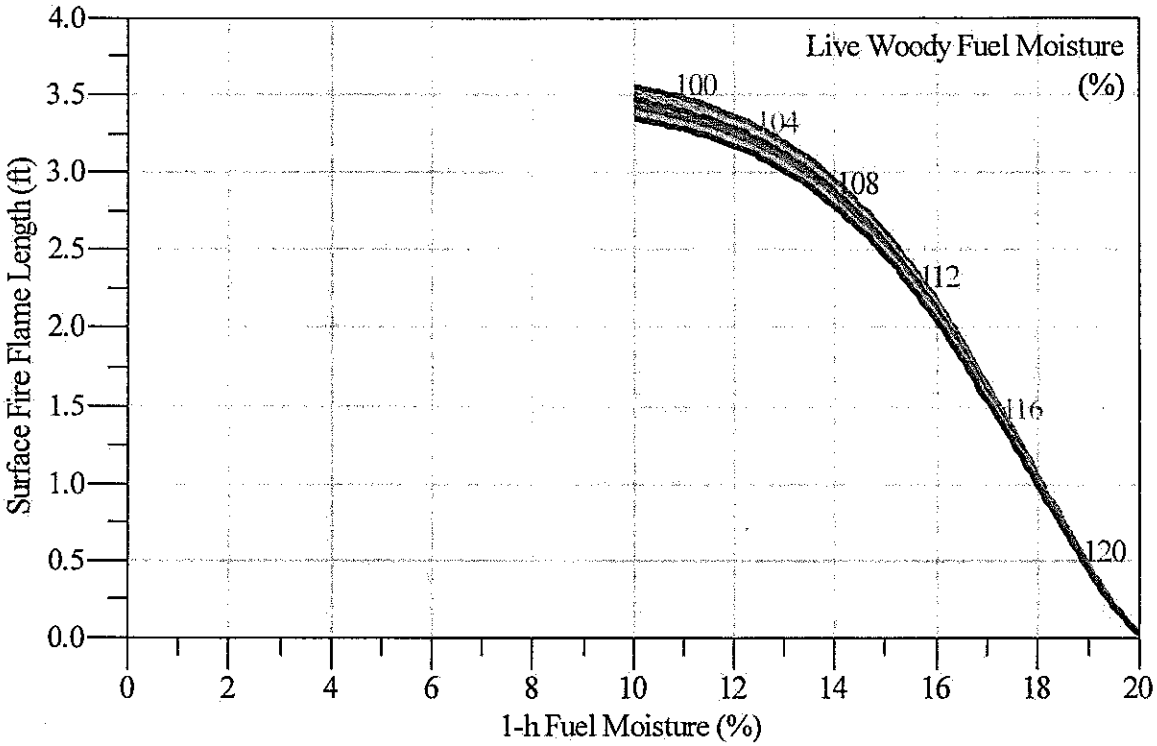
Surface Fire Flame Length (ft)

1-h Fuel Moisture %	Live Woody Fuel Moisture %					
	100	104	108	112	116	120
10	3.6	3.5	3.5	3.4	3.4	3.3
12	3.4	3.3	3.3	3.2	3.2	3.2
14	2.9	2.9	2.9	2.8	2.8	2.8
16	2.2	2.1	2.1	2.1	2.1	2.1
18	1.1	1.0	1.0	1.0	1.0	1.0
20	0.0	0.0	0.0	0.0	0.0	0.0

ERC #1
Head Fire



ERC #1
Head Fire



Discrete Variable Codes Used

ERC #1

Fuel Model		
5	5	Brush

Inputs: SURFACE

Description		ERC #2
Fuel/Vegetation, Surface/Understory		
Fuel Model		5
Fuel Moisture		
1-h Fuel Moisture	%	10
10-h Fuel Moisture	%	5, 6, 7, 8, 9, 10
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	80,100
Weather		
Midflame Wind Speed (upslope)	mi/h	25
Terrain		
Slope Steepness	%	0

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Output Variables

Surface Fire Rate of Spread (ch/h) [SURFACE]

Surface Fire Flame Length (ft) [SURFACE]

Notes

ERC #2

Head Fire

Surface Fire Rate of Spread (ch/h)

10-h Fuel Moisture %	Live Woody Fuel Moisture %	
	80	100
5	161.3	21.8
6	147.2	21.8
7	132.4	21.7
8	117.3	21.7
9	101.8	21.7
10	86.2	21.7

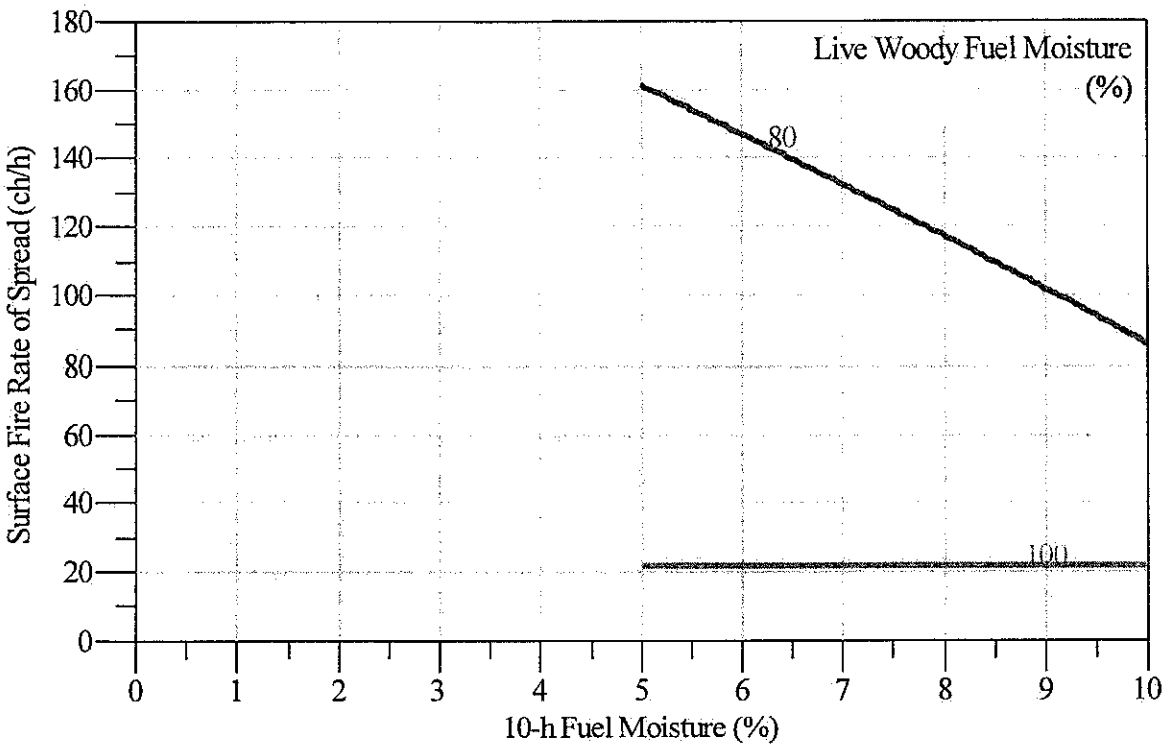
ERC #2

Head Fire

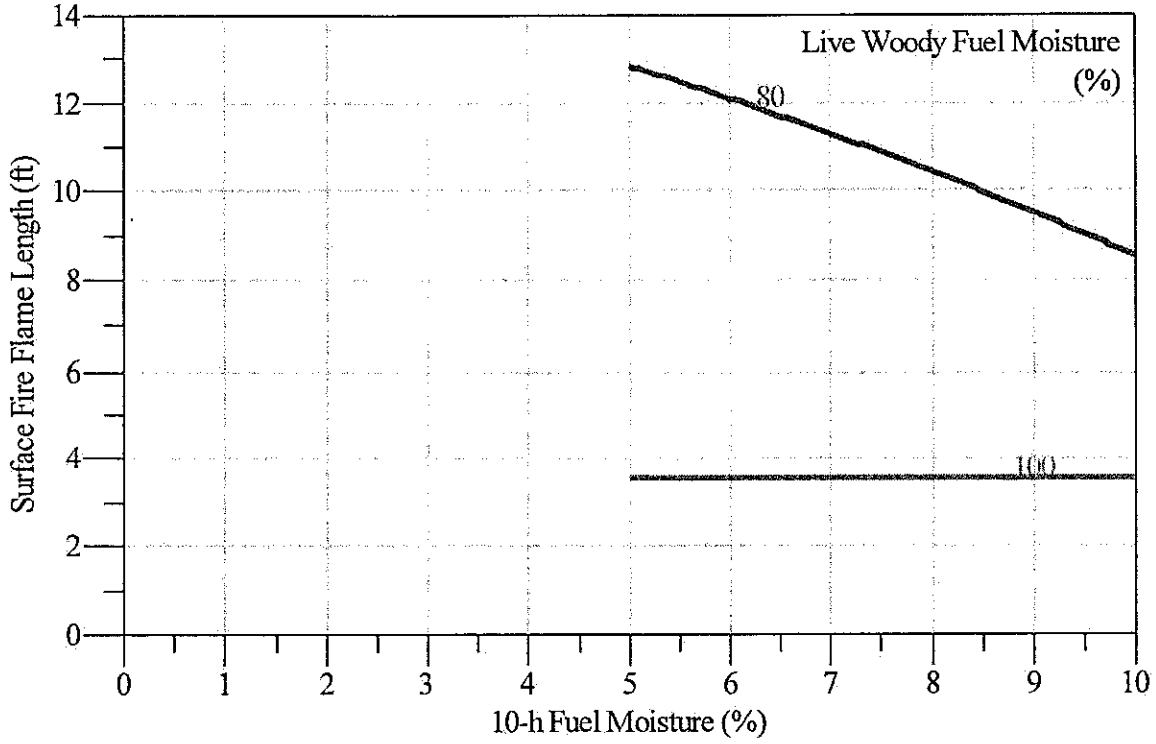
Surface Fire Flame Length (ft)

10-h Fuel Moisture %	Live Woody Fuel Moisture %	
	80	100
5	12.8	3.6
6	12.1	3.6
7	11.3	3.6
8	10.4	3.6
9	9.5	3.6
10	8.5	3.6

ERC #2
Head Fire



ERC #2
Head Fire



Discrete Variable Codes Used
ERC #2

Fuel Model		
5	5	Brush

Inputs: SURFACE

Description		ERC #3

Fuel/Vegetation, Surface/Understory

Fuel Model		5

Fuel Moisture

1-h Fuel Moisture	%	10
10-h Fuel Moisture	%	10, 11, 12, 13, 14, 15
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	80,100

Weather

Midflame Wind Speed (upslope)	mi/h	25

Terrain

Slope Steepness	%	0

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Output Variables

Surface Fire Rate of Spread (ch/h) [SURFACE]

Surface Fire Flame Length (ft) [SURFACE]

Notes

ERC #3

Head Fire

Surface Fire Rate of Spread (ch/h)

10-h Fuel Moisture %	Live Woody Fuel Moisture % 80	100
10	86.2	21.7
11	70.7	21.7
12	55.6	21.7
13	41.4	21.7
14	28.4	21.6
15	25.1	21.6

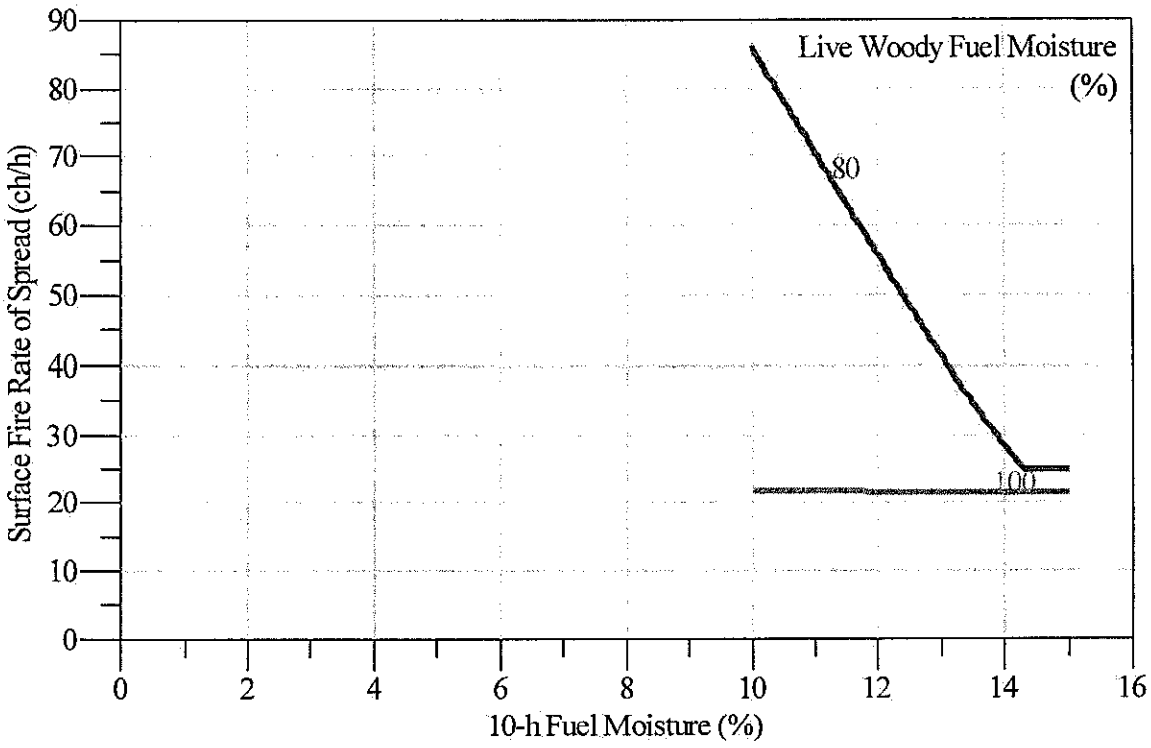
ERC #3

Head Fire

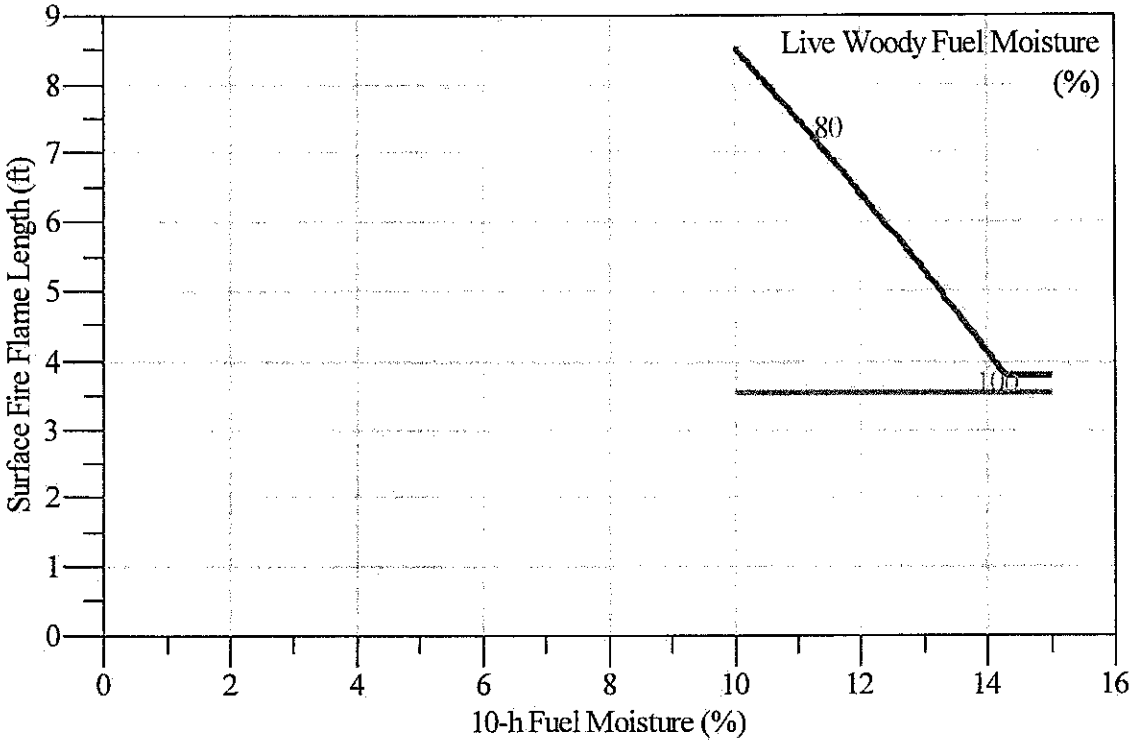
Surface Fire Flame Length (ft)

10-h Fuel Moisture %	Live Woody Fuel Moisture %	
	80	100
10	8.5	3.6
11	7.5	3.6
12	6.4	3.6
13	5.3	3.6
14	4.1	3.6
15	3.8	3.6

ERC #3
Head Fire



ERC #3
Head Fire



Discrete Variable Codes Used
ERC #3

Fuel Model		
5	5	Brush

Inputs: SURFACE

Description		ERC #4
Fuel/Vegetation, Surface/Understory		
Fuel Model		5
Fuel Moisture		
1-h Fuel Moisture	%	5
10-h Fuel Moisture	%	10
100-h Fuel Moisture	%	
Live Herbaceous Fuel Moisture	%	
Live Woody Fuel Moisture	%	70
Weather		
Midflame Wind Speed (upslope)	mi/h	30
Terrain		
Slope Steepness	%	15

Run Option Notes

Maximum effective wind speed limit IS imposed [SURFACE].

Fire spread is in the HEADING direction only [SURFACE].

Wind is blowing upslope [SURFACE].

Wind and spread directions are degrees clockwise from upslope [SURFACE].

Direction of the wind vector is the direction the wind is pushing the fire [SURFACE].

Output Variables

Surface Fire Rate of Spread (ch/h) [SURFACE]

Surface Fire Flame Length (ft) [SURFACE]

Notes

ERC #4

Head Fire

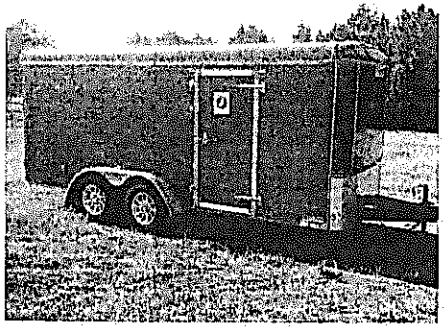
Surface Fire Rate of Spread	398.9	ch/h
Surface Fire Flame Length	23.0	ft

Discrete Variable Codes Used
ERC #4

Fuel Model		
5	5	Brush

LCRA Background

The LCRA was sparked by a vision of cooperative efforts for prescribed burning and land management activities, similar to branding cattle. In 2002, a handful of concerned ranchers and conservation professionals banded together to form the LCRA. Since then, the LCRA has grown to many members, built a large cache of prescribed burning equipment, and safely and effectively burned over 70,000 acres of land.



Conservation Partners

The Natural Resource Conservation Service, Pheasants Forever, Nebraska Game and Parks Commission, and the U.S. Fish and Wildlife Service are active in the LCRA and assist in planning and conducting prescribed burns. In addition, they offer programs to aid landowners in conservation practices.

Partner Contacts

Andy Moore– PF/NGPC, North Platte
Ph. 308-530-3671, andy.moore@nebraska.gov

Natural Resources Conservation Service
North Platte
Ph. 308-534-2360

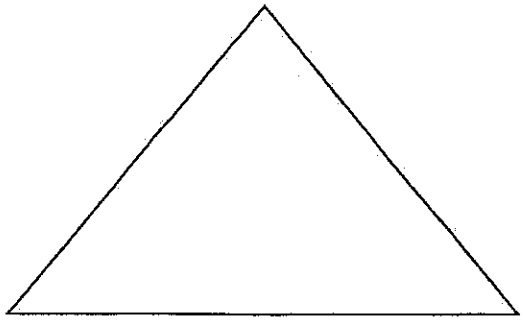
Check us out on the web at:
http://loesscanyonsburngroup.com/

Mission Statement

The LCRA seeks to conserve valuable rangeland resources while increasing range productivity and controlling invasive species. Through education, the LCRA hopes to teach the benefits of rangeland management, enabling landowners to use their resources more efficiently. The LCRA also strives to deepen landowner commitment to environmentally sound practices, including prescribed burning, prescribed grazing, and wildlife habitat management. The LCRA believes these practices will help protect the resources for future generations.

Quality Range Management in the Loess Canyons

Grazing management



Cedar removal **Prescribed fire**

The LCRA promotes a three-pronged approach to land management. Proper application of each practice will lead to healthy rangeland, benefiting ranchers as well as grassland-dependent native wildlife species.

Eastern Red Cedar Control

Removal of invasive eastern red cedar trees restores the landscape to its historic grassland condition, providing more grass for cattle and improved habitat for wildlife species.

Hello and thank you for the opportunity to provide some comments. My name is Frank Andelt. I am speaking as a landowner with property in Saline County, as a semi-retired farmer and retired wildlife biologist. I am also a member of the Tri-County Burn Association for about 10 years since that group formed. This is a group of about 50, mostly landowners that work together using prescribed burning to improve grasslands.

I support Legislative Resolution 387, as I recognize that eastern red cedars have become a big problem in many parts of Nebraska. In my specific case, I remember about 45 years ago travelling some 50 miles from our farm to dig ERC that were growing in a pasture in NW Lancaster Co. so we could plant them in a wildlife shelterbelt and windbreak on our farm. By digging the trees, we could get a quicker start than planting smaller seedlings. We had to travel that far because ERC were quite rare in most of Saline Co. except where they had been planted mostly in farmstead windbreaks.

Today, many pastures that were once almost devoid of woody vegetation are being overrun with ERC and other woody plants. It is a natural process for woody vegetation to invade and eventually replace grasslands, and it is another natural process, wildfires, that kept this area as tall-grass prairie before settlers turned that prairie into cropland. With the conversion of prairie to cropland and suppression of fire, ERC and other woody plants have been able to thrive once they gain a foothold.

On our farm, now days we are removing some of the ERC that we planted back in the 70's and 80's and in other cases, I have even been selectively removing female trees from some of our plantings to prevent their spread.

Here in southeastern Nebraska, ERC can be kept in check if landowners keep on top of the situation. Prescribed fire is the easiest and most effective method of removing ERC from grasslands if they are not allowed to get very large. If ERC are not controlled at an early stage, the cost of removal can easily exceed the value of the land on a per acre basis.

Some thoughts on possible solutions to the ERC problem:

1. Discontinue planting ERC in counties where they are the biggest problem until the time when the sex of seedling trees can be determined and only male trees planted.
2. Address liability issues that might be preventing landowners from making use of prescribed fire to control ERC.
3. Support efforts to identify alternative species to use in wildlife, windbreak, and other plantings. For example, I have found pfitzer-type junipers to be a good substitute in wildlife plantings.
4. Encourage efforts to find new uses for ERC that are being removed.

In summary, ERC have become a big problem in Nebraska, but we do have options to deal with them. Once again, thanks for the opportunity to provide comments.

State Capitol - Rm 1525 1 pm August 31 2018

Legislative Hearing - LR 387 Eastern Red Cedar

Testimony by Dennis Oelschlager

We own and manage a little over 500 acres in southeast Saline County, on the east edge of the Rainwater Basin. The land is a mostly pasture, dryland row crop, and wooded drainage areas. We have land enrolled in Conservation Reserve Programs. Our land adjoins an NRD flood control and recreational area.

We manage our land with an emphasis on conservation and wildlife habitat. We have a big problem and continuing management challenges with the spread of Eastern Red Cedar (ERC) in our area. Without constant control efforts, ERC will overtake idle areas and grow into and destroy fences. Control is a big problem along county roads where birds on wires are a constant source of Eastern Red Cedars seeds. History now available from Google Earth photos in our area shows clear farmland transformed to a thick ERC forest in less than 20 years.

When it became apparent that I was going to spend almost all of my free time cutting ERC out of our pasture and conservation reserve ground and still not keep up, I started learning about prescribed fire about 20 years ago. A big thank you to the Nebraska Game and Parks people who came out and provided hands on prescribed fire training.

In 2009 we organized a prescribed burn association - landowners and volunteers - neighbors helping neighbors - focused on helping with prescribed fire in Lancaster, Saline, and Seward counties -- TCPBA.. Burn projects have included many counties in addition to the 3 focus counties. The smoke from our many of our burn has been readily visible from the higher floors of the this building.

Our association in recent years has grown to include over 50 dues paying members. We have more than 100 people in our contact group for help on burns.

We have now helped landowners with prescribed fire for nine years - more than 4300 acres - and more than 150 burn areas. We have never had a fire escape that required a call for assistance.

Thanks to prescribed fire and our burn association, I personally went from not having enough time to keep up with Eastern Red Cedar, to having time to help others with planning and managing their prescribed burns. Of course the help we receive from other members when we do our prescribed burns is also a big benefit to us.

There are a lot of people in Nebraska who are part of a this growing community. People who recognize a the need to control ERC, as well as those who understand the benefits of prescribed fire.

I know I speak for them today when I say we appreciate the Natural Resources Committee and elected representatives who recognizing a need to consider public policy in support of efforts to control Eastern Red Cedar. I thank you for your time and service as our elected representatives, and for the opportunity to appear here today.

Photo Submitted by Vernon Hansen – Taken September 1965

Photo By Jeff Nichols – January 2011

1974

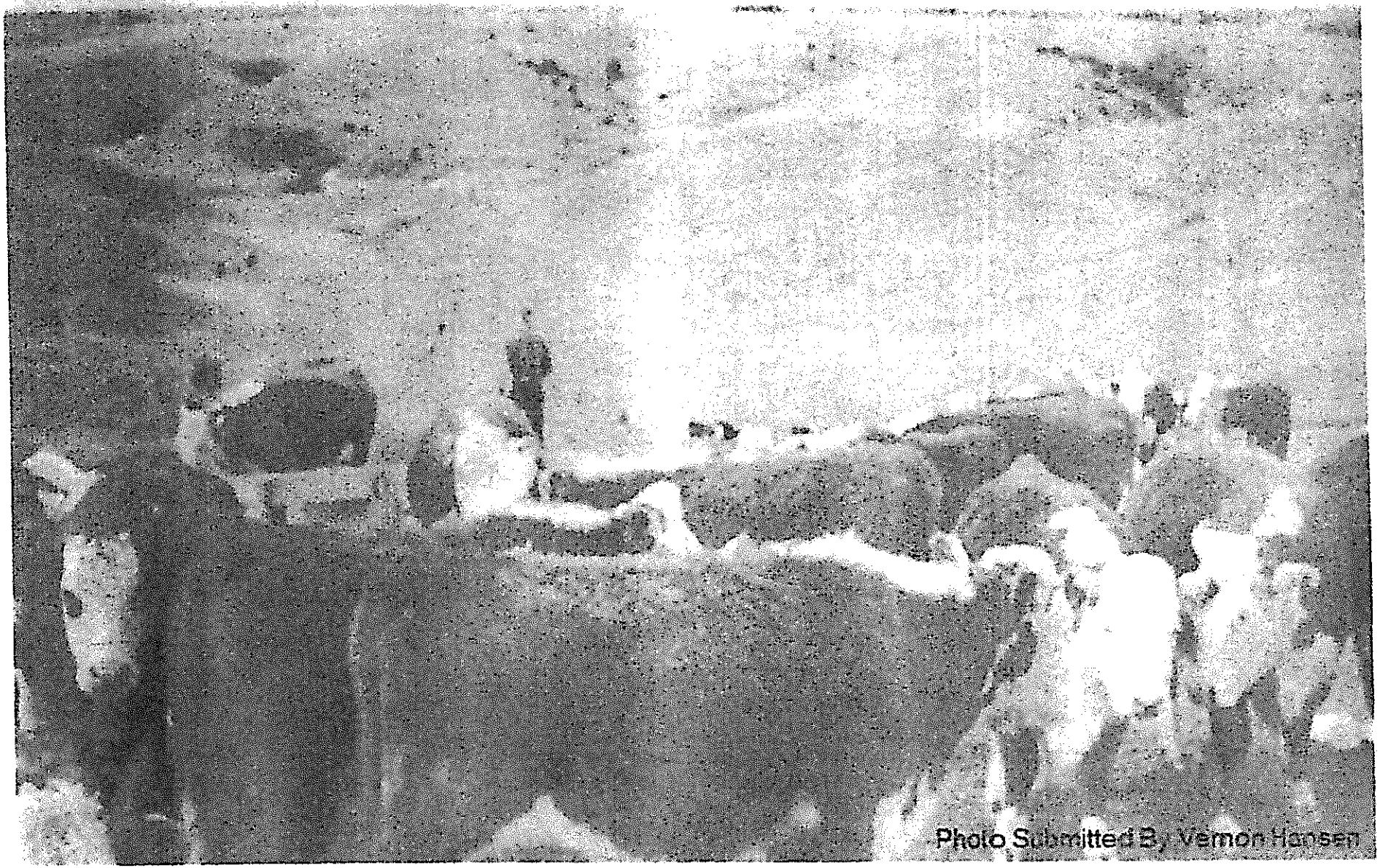


Photo Submitted By: Vernon Hansen

1996

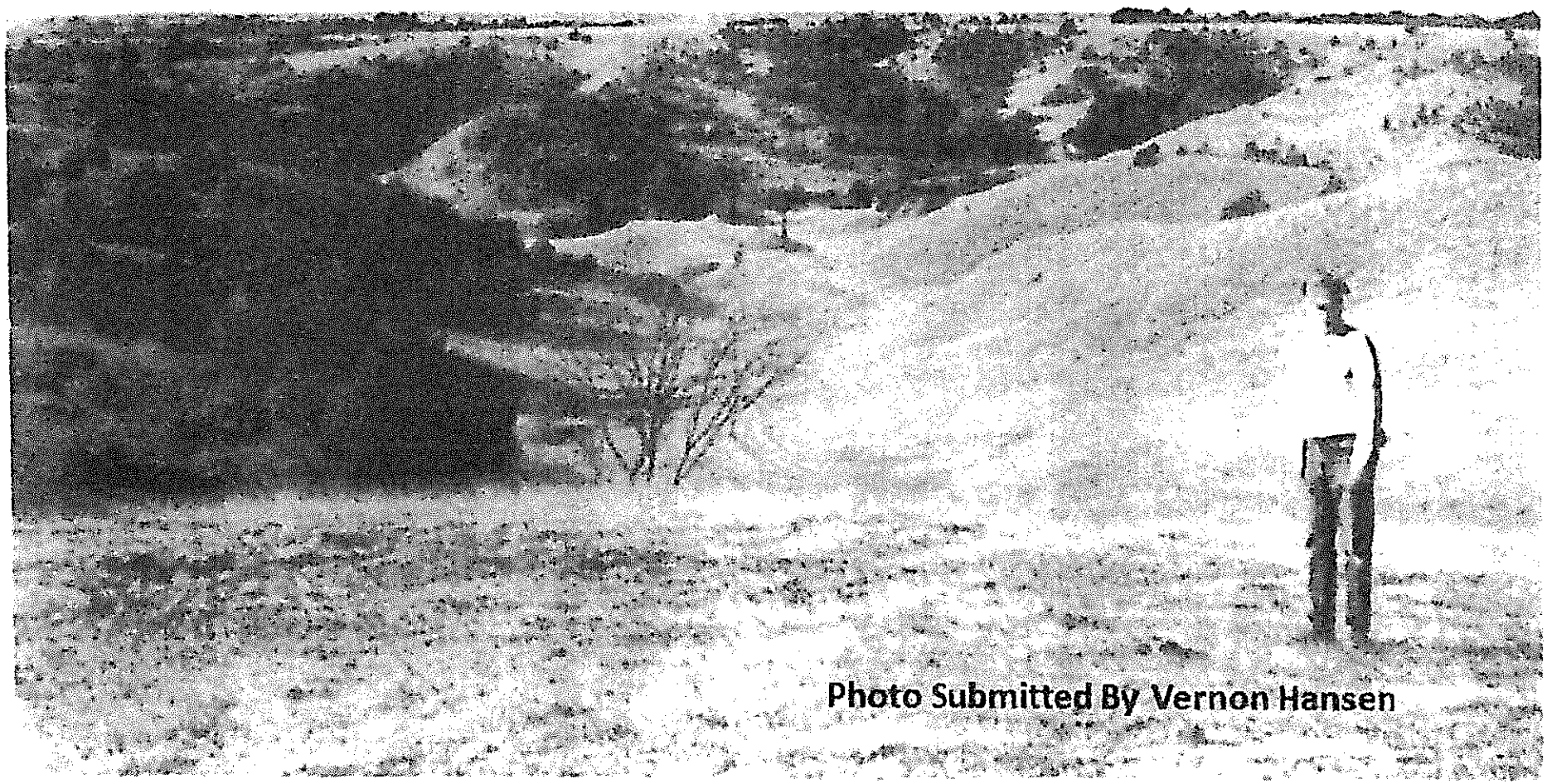


Photo Submitted By Vernon Hansen

2007

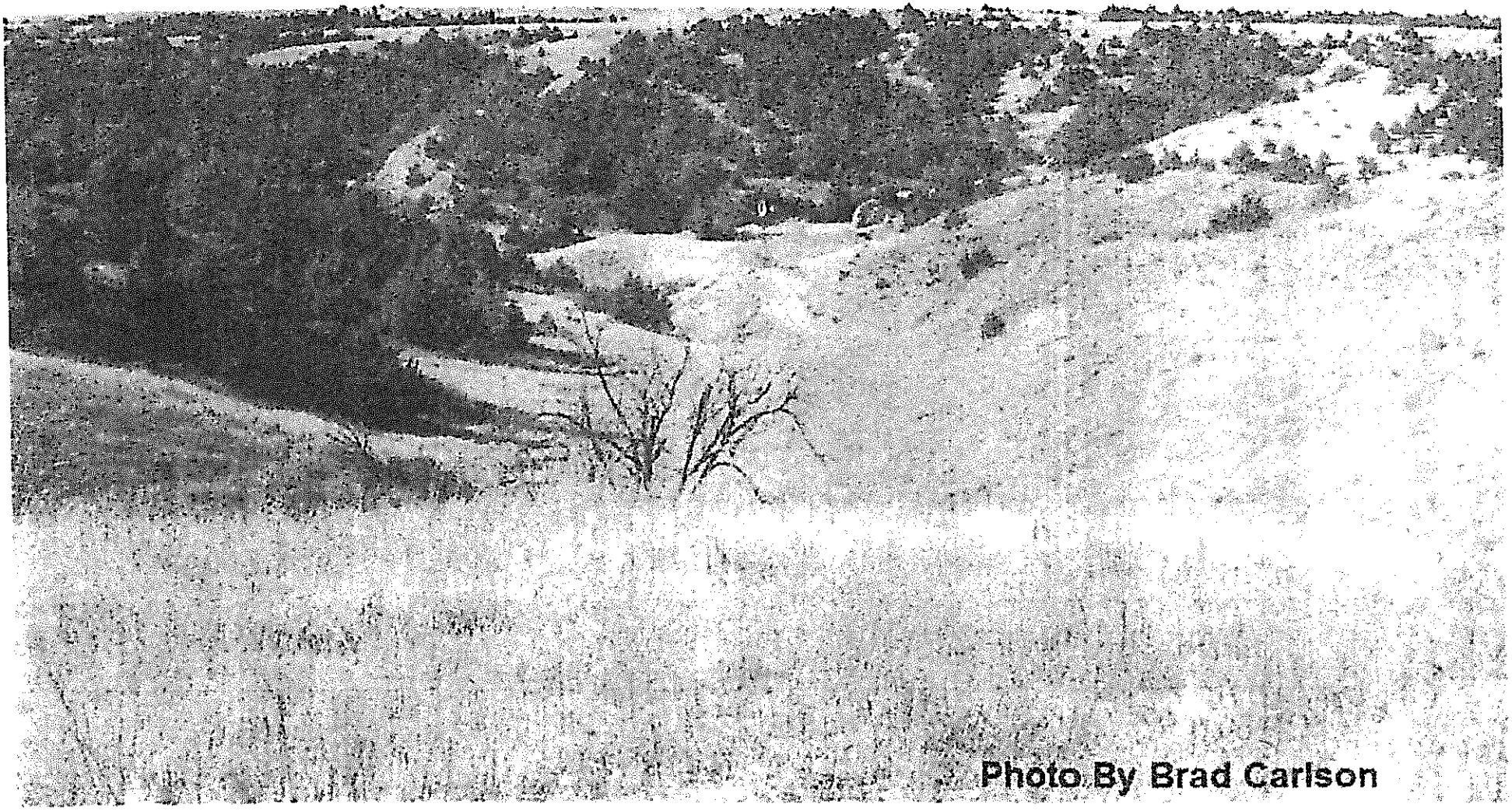


Photo By Brad Carlson

2017


Prescribed Burn Conducted By LCRA 3/14/2016
Photo By Jeff Nichols

Upper Niobrara White Natural Resources District

Serving Box Butte, Dawes, Sheridan and Sioux Counties

430 East Second Street * Chadron, Nebraska 69337 * Phone (308) 432-6190
Fax (308) 432-6187 * www.unwnrd.org

August 30, 2018

Senator Dan Hughes; Chairman
Natural Resources Committee
Room 1210; Nebraska State Capitol
P.O. Box 94604
Lincoln, NE 68509

RE: Legislative Resolution 387

Dear Senator Hughes;

The purpose of this letter is to provide information on the utilization and management of Eastern Red Cedar (ERC) in the Upper Niobrara White Natural Resources District (UNWNRD) in response to LR387. A concern of the UNWNRD is that unnecessary legislative action will be pursued to address a local management issue.

The UNWNRD has offered conservation trees and shrubs for 40+ years and records from 1995 show there have been 7.5 million trees planted throughout the district. Many of these are planted in windbreaks that provide protection for livestock, structures and reduce soil erosion in fields with secondary benefits for wildlife. The local climate is characterized by limited precipitation, extreme temperature changes and strong winds and trees have not traditionally been a part of the landscape without producer planted windbreaks. To ensure success, multiple species are included in the windbreaks one of these being the ERC. A diversified windbreak also provides year-round benefits with shade in the summer time and protection from storms the balance of the year. ERC has the ability to survive the conditions of Northwest Nebraska and provides one tool for an effective shelterbelt.

In October 2013, Winter Storm Atlas dumped up to 30 inches of snow in the area and produced 50-70 mile per hour winds. Several thousand cattle, sheep and bison perished due to the lack of cover on the open prairie. Many of the livestock that survived found shelter from the wind and snow behind planted windbreaks. This event demonstrated the need for windbreaks and shelterbelts and that each be planted with species that can survive and flourish in weather extremes.

Principally, ERC is a native species and the expansion may be natural succession. The UNWNRD does not dispute that ERC can be a challenge when not properly managed. The problem may be widespread; however, it is not statewide. The decision to utilize and manage ERC should remain at the local NRD and landowner level and not mandated by legislation. The expansion of ERC is not a species issue, it is a landowner management issue; where some are actively managing and others are not. Active management, when the trees are small, is more economic and feasible than it is to wait until the trees are mature.

The UNWNRD actively promotes the right tree, in the right location, and for intended purpose and will continue to do so. As well, staff is vigilant in advising landowners about proper management of all tree and shrub species to ensure little problems do not turn into larger ones.

Thank you for the opportunity to provide information on Eastern Red Cedar utilization in the UNWNRD and northwest Nebraska. Please let me know if you should have any questions about the Upper Niobrara White Natural Resource District's conservation tree program.

Sincerely,

Patrick O'Brien
General Manager

cc: Senator Tom Brewer, District 43
Senator Steve Erdman, District 47

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DNT

August 29, 2018

Senator Dan Hughes; Chairman
Natural Resources Committee
Room 1210; Nebraska State Capitol
P.O. Box 94604
Lincoln, NE 68509

Dear Senator Hughes:

The purpose of this letter is to provide information on the conservation value of eastern red cedar (ERC) in Nebraska. My concern is that unnecessary legislative action and/or regulations may target ERC in the future.

Since settlement of Nebraska, ERC has played a very important role for wind protection on farms and ranches. This especially applies to that part of Nebraska west of the 100th meridian, which is an imaginary line running north/south thru Cozad. Historically, the 100th meridian was well known for the fact that it was the dividing line between the wet (sub-humid) east & dry (semi-arid) west. It is a geographic boundary whereby annual rainfall is less than 20". In Nebraska's case, annual precipitation drops off drastically the further west you go from the 100th, whereby the far western Panhandle receives 12" or less.

In addition to lack of rain, high winds and low humidity create a triple threat for growing trees in this region. Consequently, farmers and ranchers depend heavily upon drought tolerant trees that flourish in this high, dry and windy place. One of our most time tested and proven performers has been ERC. Not only does it provide a much-needed buffer against western Nebraska's extreme weather, it rarely becomes a problem by colonizing pastures and rangeland. Stated simply, it is just too darned dry for ERC to seed in on its own!

In October 2013, Winter Storm Atlas carved its way thru Northwest Nebraska and onward into western South Dakota. Over 30 inches of wet snow was driven by 50-70 mile per hour winds. The aftermath of this devastating storm was beyond comprehension with 5,000 ranches sustaining major losses. Over 14,000 cattle, 1,300 sheep, 300 horses and 40 bison perished due to lack of wind protection on the open prairie. Total direct loss to the agricultural industry was $21,600,000! The few livestock that survived found shelter from the wind and snow behind planted windbreaks....of which ERC was the stronghold that refused to break under the wrath of Atlas. This catastrophe demonstrated a drastic need for windbreaks to protect rural economies, farm/ranch investments and a way of life on the unforgiving Great Plains.

My wife's family, the Spencers, ranch in Blaine County, Nebraska and are proud recipients of the AKSARBEN centurion award which recognizes 100 years of family ownership. Over those many decades, the family survived many storms....economic, and weather! Long-term management of the ranch was well grounded on the fact that we can determine our own destiny by focusing on the things that we can control. A big part of our success is that we always protect the heart of the ranch; i.e. the cow/calf herd. ERC windbreaks have been and will continue to be the core strategy behind protection of our ranch operation and its longevity.

Thank you for the opportunity to provide "real world input" on ERC and the important role it plays in Nebraska agriculture.

Sincerely,

Roger Suhr

cc: Senator Tom Brewer, District 43
Senator Steve Erdman, District 47

ROGER SUHR
321 MEARS ST.
CHADRON, NE 69337
308-432-4055

24
DNT

Kelsi Wehrman
PO Box 146
Nelson, NE 68961
402-621-0744

August 31, 2018

Pheasants Forever would like to submit our support of the LR 387 interim study. Pheasants Forever and Quail Forever have over 10,000 members in Nebraska made up of wildlife enthusiasts, private landowners, hunters, and conservationists. Since 1982, our dedicated volunteers, members and team of professional natural resources employees have implemented conservation programs at the local level. This is also made possible by working in partnership with Federal, State, and Local conservation agencies and organizations to provide technical and financial assistance and deliver voluntary based conservation programs that benefit farmers, ranchers and landowners. In addition, we also work with public land managers to help control the spread of Eastern Red Cedar to maximize conservation and wildlife benefits of our public lands. In recent years, our efforts have increased on both private and public lands to control the problematic tree. We recognize the benefits of Eastern Red Cedar plantings; however, with encroachment into our grasslands, it reduces and, in some cases, eliminates forage for livestock as well as reduces benefits for wildlife. The control methods are a combination of mechanical clearing and/or the use of prescribed fire through volunteer efforts and contractors. These programs include USDA Farm Bill conservation programs as well as the Grassland Incentives Program and Habitat Share with funding support provided by USDA, the Nebraska Game and Parks Commission and the Nebraska Environmental Trust. The primary concern of Pheasants Forever and Quail Forever with Eastern Red Cedar includes the nesting impacts of Ring-necked Pheasants, Bobwhite Quail, Greater Prairie Chicken, and a host of Grassland Songbirds. These birds need quality, open grasslands free of tall trees for adequate nesting success to maintain or grow our current populations. Without quality nesting areas, upland game birds will continue to be in decline which correlates with a decline in hunters and the upland hunting tradition. Nebraska has over 88,000 small game permit holders in the state which is a large factor playing into the total of $1.2 Billion being spent in our local communities across Nebraska with fuel, meals, lodging, and supply purchases. We ask you for your support in these efforts and we would be happy to provide any additional information if needed.

Kelsi Wehrman

Kelsi Wehrman
State Coordinator
Pheasants Forever, Inc.
kwehrman@pheasantsforever.org

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DNT

MIDDLE NIOBRARA Natural Resources District

August 31, 2018

Senator Dan Hughes – Chairman
Natural Resources Committee
Room 1210; Nebraska State Capitol
P.O. Box 68509
Lincoln, NE 68509

Senator Hughes and Members of the Natural Resources Committee,

My name is M I K E M U R P H Y and I am with the Middle Niobrara Natural Resources District (MNNRD). I would like to provide these thoughts for LR 387. MNNRD has been involved with resource management since 1972. It has been providing trees for conservation purposes to landowners to help provide wind protection, snow protection, wildlife habitat, soil erosion, and numerous other benefits that trees provide. Landowners in the Sandhills of Nebraska have tried lots of different tree species in our district. Eastern Red Cedar (ERC) and Rocky Mountain Juniper (RMJ) have been the most successful. They have been able to plant these tree species with great success because they can survive the harsh conditions. A recent example of this was during a March 2018 snowstorm. Many landowners cattle survived due to the fact that the cattle were tucked in behind a ERC grove. One of our landowners even made the comment that his cattle didn't even know that there was a blizzard happening. These weather events don't happen every day or every year, but when they do it is a reassuring fact that the benefit to cattle, wildlife, and humans is priceless.

In 2006 and 2012 the Central Niobrara area around Valentine, experienced major wildfires. These wildfires were the result of unmanaged forests. Nebraska being the home of Arbor Day, it has made its citizens believe that if a tree is green that it should not be cut. This is farthest from the truth. In order to manage for healthy trees and forests, property owners need to manage the forest, just as landowners manicure their yards, farmers farm their fields, and ranchers manage their grassland. In 2015, the MNNRD started providing assistance to landowners who were beginning to cut and remove trees to reduce the fire threat. As trees begun to get cut, they were piled and planned to be burned. It was these piled trees that were not getting burned that allowed us to create a by-product that could be used locally. The trees were turned into chips. The chips have been used to reduce erosion on trails and blowouts, improve soil health on farm fields and pastures, and most recently added to manure to create compost for use. Looking for ways to utilize ERC and all trees is part of the equation to manage natural resources. Forestry management is expensive, takes time, and labor intensive. It is something that property owners need to budget for every year just like other things that are budgeted for on their properties. One landowner may wish to have certain trees, while the neighbor may wish to not have any. I don't believe any of us want some policy telling each of us property and home owners how to manage our front and back yards.

Resource management will not be accomplished through policy, but through education that allows property owners to make informed decisions on how they want to manage their own property. Unfortunately, as we witnessed in 2006 and 2012 with the large-scale wildfires, mother nature is one thing that we can not control. We can all work together and let resource management happen locally on the landscape level through voluntary conservation management.

Sincerely,

Mike Murphy - MNNRD

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DNT

LEWIS & CLARK NRD NATURAL RESOURCES DISTRICT

608 N. Robinson
P.O. Box 518
Hartington, NE 68739
Office: (402) 254-6758
Fax: (402) 254-6759
Email: lcnrd@hartel.net

August 30, 2018

Honorable Senator Dan Hughes
Natural Resources Committee
Room #1210
PO Box 94604
Lincoln, NE 68509

Dear Senator Hughes and Members of the Natural Resources Committee,

Thank you for the opportunity to provide testimony on LR387, Interim Study to examine issues relating to the spread of Eastern Red Cedar trees.

The Lewis and Clark NRD (LCNRD) works with landowners in both planting and management of Eastern Red Cedar (ERC) in Cedar, Dixon, and Knox Counties. Each spring LCNRD assists landowners looking to establish field or farm windbreaks. The majority of those windbreaks include at least one row of Eastern Red Cedar.

ERC is a proven, native option for windbreak establishment in the northeast corner of the state. Landowners are generally aware of the risk that ERC could spread and require management in the future. However the survivability and reasonable time frame for becoming effective in protecting their property drive landowner tree selection.

LCNRD also provides assistance to landowners conducting ERC management practices in pastures through the NSWCP cost share program. In addition landowners utilize EQIP and other funding sources to manage ERC and other species through cutting and/or prescribed fire that impact overall grass productivity and/or pasture condition.

Thank you for the opportunity to provide testimony on this issue.

Sincerely,

Annette Sudbeck
General Manager

27
DNT

Upper Loup
Natural Resources District

39252 Highway 2 Thedford, NE 69166
Phone 308-645-2250 Fax 308-645-2308
www.upperloupnrd.org
ulnrd@upperloupnrd.org

Protecting Lives, Protecting Property, Protecting the Future

August 20, 2018

RE: LR 387

Dear Senator Hughs,

This letter is to show our support in the legislature investigating the eastern red cedar (ERC) and the factors and impacts it is having statewide.

The Upper Loup Natural Resources District (ULNRD) is located in the Sandhills of Nebraska and contains 4,275,000 acres which is over 90% grassland. There is no doubt that the eastern redcedar is a tough and hardy native tree species, that is expanding across much of the state, in part due to its adaptability to a wide range of conditions. Due to its hardiness and adaptability it has been one of the few species that does well in the Sand hills.

Since the mid-seventies the cedar is one of the few tree species that will actually do well in our sandy soils and provide the needed windbreak protection to producer livestock. To date there has been no quantifiable loss of wildlife, critical habitat or economic loss due to the ERC within our ULNRD boundaries. We understand that this is not the case across the state. Because of this, our Directors believe the cedar concerns would be best managed locally. Our State is so diverse and we feel that there is not a one size fits all when it comes to the ERC issues.

Locally, the Upper Loup has taken several proactive steps in regards to ERC control. For instance, we offer cost-share for a variety of brush management practices to producers such as biological, mechanical, chemical and prescribed burns. We no longer provide cost-share to producers on purchasing or planting cedars. Because many of our producers still like the species because it does do well in our soils we will still sell them, but just not provide cost-share or planting services. We also a partnered with a local RC&D to purchase a tree shear to be used to help remove and manage cedars.

Sincerely,

Anna Baum

Anna Baum, General Manager Upper Loup NRD

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August 30, 2018

Natural Resource Committee
Nebraska Legislature
Chairman Senator Dan Hughes

Senator Hughes,

On behalf of the Nebraska Sportsmen's Foundations Statewide membership base, conservation partners and the Board of Directors. I want to Thank you and the members of the Natural Resource Committee for taking the very important step to educate on a severe issue we have been working to overcome in Nebraska with LR387 and scheduled hearing regarding the Eastern Red Cedar invasion of our lands.

Please let this letter be submitted to the record showing the Nebraska Sportsmen's Foundation extremely strong support with moving forward to develop a state-wide management plan and education on the current and future threat of the ERC.

Eastern Red Cedar, a tough and hardy native tree species, is rapidly expanding across much of the state, in part due to its adaptability to a wide range of conditions, the lack of fire on the landscape (both prescribed fire and wildfire), changes in farm and grazing practices, drought, lack of grassland and forest management, changes in land ownership patterns, and conservation plantings as a seed source. Cedar has expanded more than any other species across much of the Midwest and Great Plains. Many Nebraskan's don't perceive redcedar encroachment as a significant threat until trees have overtaken an area and become too dangerous or expensive to remove. Now is the time for proactive cedar removal and management while it can still be addressed.

We feel LR 387 is a positive step in the right direction and SUPPROT.

Best Regards,

Scott Smathers
Executive Director
Nebraska Sportsmen's Foundation