Mid-Missouri River Prescribed Burn Association *News*

Winter 2019/2020

Focusing on cedar tree control and grassland health

Welcome

Anticipating 2020

Staying optimistic for good spring conditions

By Keith Hovorka, MMRPBA Chairman

For most of South Dakota, 2019 presented challenging conditions due to the weather – impacting farmers, ranchers and communities. For the Mid-Missouri River Prescribed Burn Association the wet weather conditions were frustrating, and prevented us from completing any cedar tree control burns. In spite of that, we remain optimistic as interest in the MMRPBA from the local four county region and from across the state continues to grow.

We are planning for 2020, and I'm pleased to report we continue to receive calls and are already meeting with several new landowner clients to discuss new prescribed burn plans in our area for the future.

In this newsletter, we have a lot of great information to share. We have funding to help shoulder the cost of deferred grazing after a prescribed burn (see page 2); we have information about the necessary partnership between landowner and renter as they plan and conduct a burn (see page 3); and we have updates on some of the prescribed fire impact research being conducted by SDSU (see page 9); with lots of other informative articles in between.

For members of the MMRPBA, I would like to make you aware that we are adding a "members only" section on the MMRPBA website. This will allow members to have access to meeting minutes, budgets, treasurer reports and prospective burn details, as well as a list of equipment available from various board members for burn projects. This special section will be assessable with a password login that will be shared with dues paying MMRPBA members.

Find our website at https://www.midmissouririverpba.com/ and consider following us on Facebook at https://www.facebook.com/MMRPBA. Information about becoming a member is available on our website, as well as on page 6 of this issue.

Finally, I invite you to attend the MMRPBA annual meeting on January 15, 2020 at the Community Hall in Bonesteel, SD. Should the weather impact our event, we've set a storm date of Jan. 22. This meeting is a great opportunity to visit with other landowners and learn more about the prescribed burning efforts of MMRPBA. I will see you there.

Mid-Missouri River Prescribed Burn Association News
Sponsored by the Mid-Missouri River Prescribed Burn Association and SDSU Extension
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Post-burn deferred grazing funding available

By Dave Steffen

The Mid-Missouri River Prescribed Burn Association has identified a funding source for deferring pastures after a cedar tree burn is completed. A payment of $20 per burned acre can be paid to producers who agree to defer grazing after completing a prescribed burn in the four county MMRPBA burn area.

Funding is being made possible from a State Conservation Commission Grant to the Brule-Buffalo Conservation District. To qualify for the $20 per acre payment, the producer must provide deferment from grazing for a minimum of 100 days after June 1st to allow the warm season, native grasses a chance to re-establish plant vigor. The deferment from grazing will allow the plant community the opportunity to build a ground cover and jump-start the secondary succession of plant growth on burned sites.

For more information and to request assistance in planning your burn, contact one of the MMRPBA Board members listed on the inside front cover of this issue. Funds are limited and the prescribed burn planning takes some time, so get started as soon as possible for the upcoming year. If you already have a prescribed burn plan developed and would like deferred grazing assistance, contact one of the directors to get the paperwork started.

About the Cover:

A team including SDSU Extension specialists, students and landowners scouted research sites near the Missouri River on the Mulehead Ranch early this past summer. Read more about the research efforts underway on Page X. Photo by SDSU's Xu Lan.

A prescribed burn was conducted on the Rich and Sara Grim's place in the spring of 2016. These photos show the re-establishment of healthy grasses after Easter Red Cedar is burned and why deferment of grazing is essential.

The trees and ground cover are burned off during the fire.

One week after the burn grass begins to emerge.

In May 2016, grass, flowers and other plants begin to establish themselves.

Several weeks after the burn a healthy stand of grass is found in the burned area.

The Mid-Missouri River Prescribed Burn Association is a non-profit 501(c)(3) formed to control cedar tree infestation and improve grassland health by conducting prescribed fires. MMRPBA's efforts will focus on land in Brule, Charles Mix, Gregory and Lyman Counties, with the goal to conduct 2,000 acres of prescribed burns each year for the next three years.

It takes a partnership:

Absentee owner and renter must work together for pasture renovation

By Greg Schmitz and Tom Hausmann

Editor's note: This article provides real-world perspective on prescribed burning from Hausmann, who is the absentee landowner, and Schmitz, a Bonesteel, S.D. rancher who leases his land. They are both board members with MMRPBA.

Properly maintained pastures require ongoing, cooperative and mutually beneficial processes planned and executed by owners and renters, especially if the owners are absentee. While non-operating land owners likely have a return on investment mindset, they also realize that they and their renters need to continually discuss, plan and engage in effective long-term proper pasture management procedures. This is particularly true if they both recognize that an increasing number of cedar trees are limiting the carrying capacity and devalue the property itself.

The first step in creating a solid working relationship between an owner and a renter is addressing the long-term goals of both parties. Trust and confidence in one another are fundamental to creating and maintaining this relationship.

Absentee landowner Tom Hausmann, has recognized the importance of controlling cedar tree encroachment on land he owns, and has worked with rancher Greg Schmitz, who leases his land, to conduct prescribed burns.

Of course, renters who are offered only annual or short-term leases are more apt to simply take another crop of grass and not worry about the long-term effects of poor management.

However, a longer-term lease helps the owner gain cooperation from the renter while providing some security for the renter to benefit his/her longer term plans also.

As MMRPA members with burn experience would agree, if cedar trees are a primary renovation concern, the process of ridding pastures of cedar trees is also long-term, taking up to two or three years for planning and execution just for the initial burn.

First, if the shearing/burning of cedar trees is a viable option in heavily populated cedar tree areas, the owner and renter need to discuss the risks and complications of such an action, especially if the areas are in rough terrain.

The renter needs to recognize the possible need for deferred grazing, the need to create or improve trails within the burn area, the marking of dangerous or difficult areas to travel within the burn area, and the likely clean up needs after the burn is completed – since a good share of this work may become his/her responsibility

Second, the owner and renter need to discuss and plan the actual process itself: descriptions of the specific areas to be burned, what local personnel might be able to help with the actual burn, access of safety equipment in case of an emergency, and the utilization of natural fire breaks like roads and waterways among other criteria.

In some cases, conferring with neighbors who also have a cedar tree problem and are interested in burning may simplify some of these considerations. Sometimes burning a larger landscape provides more natural firebreaks and solves access issues within the burn area and for safety equipment and other concerns.

Finally, both the owner and renter need to take advantage of the knowledge and experiences of the MMRPBA members. Ideally, both owners and renters would attend burn association meetings and get involved in conversations with others who are planning or have already implemented burns. The owner and renter need to participate in several burns, particularly in terrain similar to theirs. They need to observe up close how the ignition team works together and notice what preparations and equipment are on hand for fire suppression and other key functions in the process. They need to take notes and discuss how they can apply what they have experienced and learned.

Tom Hausmann, in brown vest, gives a briefing before the burn, while Greg Schmitz, in foreground in brown jacket, listens with the rest of the burn crew.

Pastures that have been neglected for some time definitely need such a common sense approach if the owner is interested in retaining the value of his or her investment. And, the renter will value such an approach for his or her own success.

As successful MMRPBA burns since 2017 have indicated, the shearing/burning of cedar trees have been effective and are practical methods of beginning or continuing the process of pasture improvement—through participation and involvement of both the owners and the renters.

It takes a good-sized crew for a successful prescribed burn. This crew gathered after the burn on Tom Hausmann's land, he (wearing the grey t-shirt) is in the front row kneeling, while Greg Schmitz, who rents the land that was burned, is standing directly behind him.

Understanding what is needed for a safe prescribed burn

By Brad Christensen
MMRPBA Training Officer

The two most common comments Mid-Missouri River Prescribed Burn Association (MMRPBA) members hear regarding why more landowners aren't conducting their own prescribed burns are: *"We don't know how" and "We're afraid."*

This is understandable since we've all seen news stories of huge wildfires that started as a prescribed burn and no one wants to be the individual in charge of the one that "gets away."

I am often asked if prescribed burns are a safe and effective land management tools and if a good burn plan is prepared and followed, then why are there escapes that turn into wildfires? The answer is simple, most escaped burns are the result of trying to burn when the weather is outside of the prescription or someone ignites more than they are supposed to.

Following the burn plan – and more important the "prescription" – is an absolute. You can't burn if the forecasted wind is going to get too strong, or it switches to the wrong direction, or the relative humidity is going to get too low at any time during the burn. An accurate current weather forecast is necessary before the burn can be ignited. And, if the burn will take more than a few hours, an updated forecast during the burn may be necessary. If at any time within the upcoming 24 hours there is a chance of unfavorable weather, the burn should be postponed.

It's difficult to have help all lined up to conduct a burn and at the last second get a forecast that shuts the burn down, but it's part of conducting safe, successful burns.

At a minimum a good burn plan has:

- what is going to be burned, including a legal description;
- what the objective of the burn is;
- what and where the control lines are;
- equipment and personnel needed to conduct the burn;
- what the needed weather is including wind direction, minimum and maximum wind speed, minimum and maximum relative humidity, and minimum and maximum temperature;
- where the smoke will go and who or what will be impacted;
- ignition sequence, how the burn is to be ignited;
- how the burn will be shut down if something is getting out of prescription;
- what is considered a slop over and what is considered an escape, and when to call 911 and who will do it.

Burns approved by the MMRPBA require the landowner or their agent to notify 911 when the burn is started and then *again* when the burn is out. This is so the dispatchers know not to send the fire department for every call from people driving by, seeing smoke, and calling 911.

Workshop opportunity

The MMRPBA board is considering hosting a field day workshop in spring 2020 if there is enough interest. The workshop would be a one-day training that would allow individuals to help with a prescribed burn. The day would consist of a short training class, a briefing, an actual small prescribed burn, and an after-action review to critique the burn. The trainees would get hands-on experience on putting down a wet line, using a drip torch, and mopping up the burn area. Like a prescribed burn, the workshop would be dependent on the weather.

If you are interested in attending a prescribed burn workshop next spring, weather permitting, please call Keith Hovorka at (605) 464-0377, Sean Kelly at (605) 840-2200 or Brad Christensen at (605) 830-0931.

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- what is considered a slop over and what is considered an escape, and when to call 911 and who will do it.

Mid-Missouri River Prescribed Burn Association

(Brule, Charles Mix, Gregory & Lyman Counties South of I-90)

Membership Application

Name: _____

Address: _____

City, State, Zip: _____

Home Phone: _____ **Cell Phone:** _____

Email Address: _____

If you own land that may be burned in the future, which county is it located in: _____

Category of membership requested: (Check one)

Individual Membership: (May vote, dues $25) _____

Organizational Membership: (1 vote/organization, dues $25) _____

Name of organization represented: _____

Associate Membership: (No vote, no dues) _____

I wish to become a member of the Mid-Missouri River Prescribed Burn Association and agree to pay the applicable $25.00 membership dues, certify that I have never been convicted of a felony or crime involving arson, sexual misconduct or extreme immorality and, agree to a background check.

Signature: _____ Date: _____

Return Application and Membership Fee To:

Sara Grim
35801 Old 1806th Road
Bonesteel, SD 57317

Make membership fee checks payable to: MMRPBA

Treatment recommendations

for Eastern red cedar and Rocky Mountain juniper

Pictures shown give comparison of during and after a burn at Justin and Sarah Bailey's in 2017 and then again in 2018. The after pictures show healthy stands of native warm season grasses and desirable hardwood trees and no cedar trees.

Submitted by Rod Voss,
NRCS Rangeland Management Specialist

Author's note: South Dakota NRCS Range Technical Note 10 provides an overview of species-specific treatment recommendations for evergreen coniferous trees Eastern red cedar and Rocky Mountain juniper. Following are excerpts from that document.

The Technical Note cites these native species are often associated with shallow soils with steep to rolling topography where they are a natural component of several ecological sites. Common in tree plantings across the state, seeds are transported primarily by wildlife. Suppression of fire has increased canopy and density of these species. As population and density increases, they will begin to move on to more productive, flatter landscapes which is when the loss of productive grasslands becomes an even greater concern. The preferred method of controlling cedar or juniper encroachment is CPS Prescribed Burning (338).

When To Burn

Prescribed burning is most effective in late winter and early spring when sap flow is low, and trees are in a dry state. Fire is also most effective when the trees are under five feet' tall, and less than three feet tall is still preferable. Burning prior to the time trees reach a height of three feet will provide excellent control and ensure adequate fine fuels around the base of trees to carry a fire to the trees.

Management of herbaceous fuels is critical to a successful burn. For tall trees over six feet tall and/or dense stands of tall trees where an understory of herbaceous fuels is absent, strategic location of cutting and stuffing of mechanically cut trees is critical to the success of a prescribed burn. Fires on taller trees can be effective when done in conjunction with mechanical cutting

and stuffing of trees under and against tall trees allowing for a continuity of fuel into the upper canopy of the taller trees.

Prior to the planned burn to effectively utilize fire, the fuel load can be managed by providing rest from grazing for the entire year or at a minimum, deferred from grazing after June 1. Increasing the fuel load (herbaceous) increases the effectiveness of the burn on trees up to five feet tall. Fuel loads more than 2,000 pounds per acre is suggested. An effective method of managing a unit with a diversity of short to mature tall cedars includes a four to five-year plan.

Timeline For Prescribed Burns

Though not intended to be a complete description of implementing an Eastern red cedar control plan, the following timeline will assist in the development of a control plan where mature tall trees and young trees exist.

- **Summer/Fall Prior to Year 1** – Develop an outline of the prescribed burn plan, determining objectives, management unit, fire break options, preferred wind directions, adjacent fuel concerns. Determine need and placement of stacks during mechanical treatments to target tall trees. It is critical that placement of stacks consider the risks associated with embers that may distribute well beyond 500 feet downwind.
- **Spring and Summer Year 1** – Finish the prescribed burn plan. Trees more than 4-6 feet are mechanically cut at the base and stacked high under the live tall trees according to the prescribed burn plan locations as determined. Stacking several cut trees under the tallest live trees as soon as possible after cutting will limit the number of seeds dispersed in the moving process as well as retain more needles on the tree which will be a beneficial fuel for igniting the taller trees. Stacking should occur one to nine months in advance of the prescribed fire. The area will be rested from grazing or at a minimum provide a total deferment after June 1 to encourage the best possible herbaceous fuel load.
- **Fall Year 1** – Ensure proper fire breaks are installed.
- **Year 2** – Apply prescribed burn in late winter or early spring when weather permits according to the burn prescription. Post fire management should defer grazing for a minimum of 60% of the growing season, and ensure that desirable species are not grazed beyond 50% by weight.
- **Year 3** – Provide grazing management to ensure desirable species are not grazed beyond 50% by weight. Targeting invasive cool season grasses at this time may further benefit the desirable native plant community. Change the timing of grazing to differ from Year 2. Defer grazing for a minimum of 60% of the growing season.
- **Year 4** – Provide grazing management to ensure desirable species are not grazed beyond 50% by weight. Change the timing of grazing to differ from Year 3. Evaluate the unit to determine if a flush of young seedlings is re-establishing and whether an additional prescribed burn is needed in Years 5 or 6.
- **Year 5** – Continue with prescribed grazing and continue to evaluate the need for additional control of young seedlings less than 3 feet tall. Annual evaluations will be necessary.

What About Delays?

Complexities with the prescribed burning associated with weather and fuels may result in the need to postpone the fire from Year 2 to Year 3 or later. This is acceptable and often necessary to accomplish a safe burn within the prescription of the burn plan. Burning a few years after a mechanical treatment will also permit most of the seeds of cut cedar to germinate thereby creating a desirable control opportunity on the seedlings.

Once the control of the eastern red cedar has been achieved, continuing a grazing management plan coupled with prescribed burning every 3 to 6 years will maintain a healthy and diverse stand of native plants.

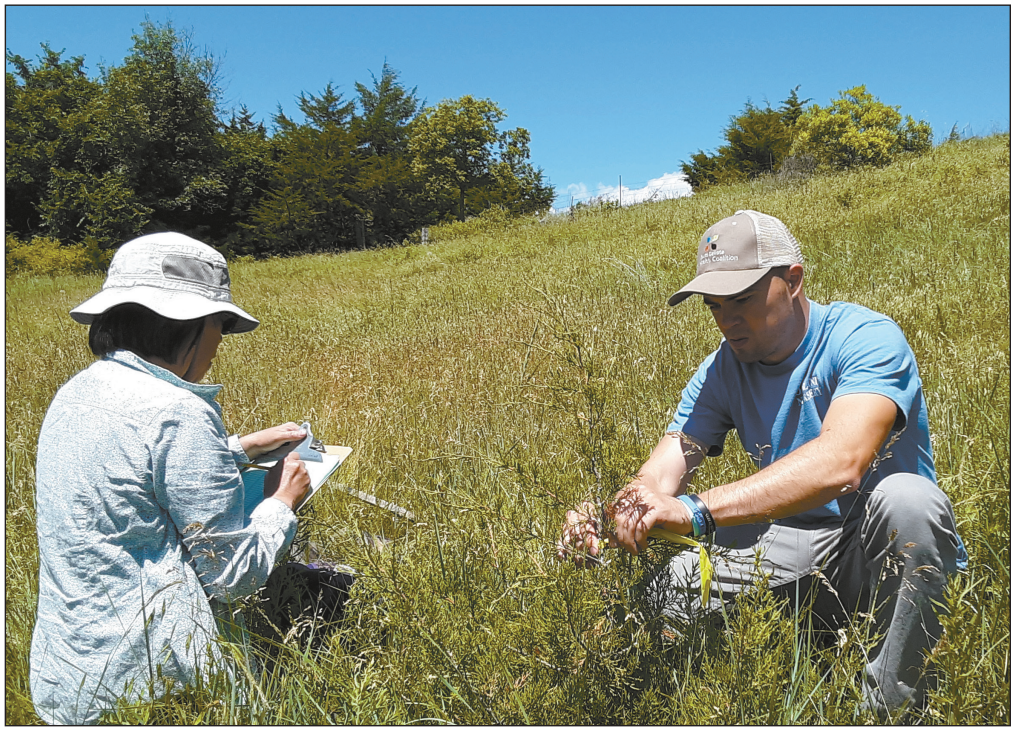
Other methods for controlling this species includes mechanical methods such as cutting individual trees, dozing, chaining, and cabling which are effective but labor and/or cost intensive. Mechanical cutting or grinding must ensure that treatment is below the lowest limb.

In the absence of a later prescribed burn, often a massive germination of cedar seedlings will establish from the existing seed bank. Grazing management itself is often not adequate to controlling the existing seed bank. Chemical methods are also available but generally less cost effective than the prescribed burning and may negatively impact desirable species.

"Once the control of the eastern red cedar has been achieved, continuing a grazing management plan coupled with prescribed burning every 3 to 6 years will maintain a healthy and diverse stand of native plants."

Research Underway: MMRPBA 2019 Report

By Dr. Alexander Smart, Dr. Lan Xu, and graduate student Robby Schaefer from South Dakota State University



Dr. Lan Xu, and graduate student Robby Schaefer from South Dakota State University mark trees for the study.

Several research projects were initiated in 2019 by South Dakota State University within the four county MMRPBA area. Highlights from these efforts are summarized here. Two additional phases of research projects will be pursued beginning in spring 2020. These will include evaluating tree moisture on a monthly basis and evaluating cedar tree oil content on a monthly basis as well.

Aboveground Biomass

We marked five random individual trees in each of five height classes: <1 m, 1-2 m, 2-3 m, 3-4 m, and >4 m tall and five grassland control plots on two ranches located in Gregory County, SD, along the Missouri River in 2019. Height, diameter breast height, basal diameter, and canopy diameter (in two perpendicular dimensions) were measured for each tree.

Herbaceous forage biomass was estimated by clipping two 0.25 m2 quadrats adjacent to the trunk of each tree and in 10 open grassland control plots at each ranch in late-July.

Analysis of variance and regressions were conducted on forage biomass and tree class, height, diameter, and volume. Average forage biomass reduction was 70% across all tree classes compared with grassland controls ($P<0.01$). There were no significant differences detected among the tree height classes <2 m tall. Tree height was the best predictor ($r2=0.59$, $n=60$, $P<0.0001$) among all variables we measured. There was a linear decrease in forage biomass (kg/ha) across tree height classes expressed by the equation $Y = 3200 - 6 \times$ tree height (in cm).

Takeaway: Our results suggest rangeland managers should monitor tree height and apply appropriate tree removal before it reaches critical height (>1m) to avoid large forage biomass reduction.

ERC Tree Growth and Encroachment

We marked five random individual Eastern red cedar (ERC) trees in each of the five height classes: <1 m, 1-2 m, 2-3 m, 3-4 m, and >4 m within permanent control sites at three locations in Gregory County, SD. Height, diameter breast height, basal diameter, and canopy diameter (in two perpendicular dimensions) were measured for each tree and will be monitored annually for growth rate.

Additionally, within the same three control sites, six 10m^2 permanent plots were randomly assigned in open grassland areas adjacent to high density, mature ERC trees for ERC encroachment assessment. ERC trees present within the plots were counted and measured for height, diameter breast height, basal diameter, and canopy diameter (in two perpendicular dimensions). Growth rates, as well as new ERC encroachment within the plots, will be monitored annually.

In the spring of 2019, 144 ERC seedlings were planted in Brookings County in order to examine survival of ERC seedlings by vegetation type (cool season introduced vs. warm season native) and grazing intensity (no clipping vs. clipping to maintain 6cm stubble height). Initial seedling height (cm) and basal diameter (mm) were measured and will also be monitored annually.

Soil Microbial Communities and Soil Nutrients

Three ERC trees were randomly selected on two ranches in each of the five height classes: < 1m, 1-2m, 2-3m, 3-4m, and > 4m. Multiple soil cores (2-cm dia. X 15cm depth) were extracted under each tree to form one composite sample per tree as well as in three adjacent grassland areas for comparison.

Also, soil cores were taken from six randomly selected locations within each of the following five treatment areas located on one ranch: one, two, and three

years post fire; grassland control; and ERC forest control. Phospholipid fatty acid (PLFA) and soil nutrients will be analyzed for all samples to assess soil community structure and abundance and soil nutrient availability.

Other Soil Measures

Water infiltration and runoff were assessed within three burned sites located on one ranch (burned in 2019, 2018, and 2017), which were heavily encroached by ERC, as well as in adjacent grassland and ERC forest control sites for comparison in order to assess the effects of ERC encroachment and burn treatments on water infiltration and runoff. Additionally, multiple soil samples were collected under ERC forest canopies (including the three burned sites) and in adjacent grasslands on three ranches for soil bulk density, soil moisture, soil aggregate stability testing, and soil texture assessment to supplement other analyses.

Water infiltration and runoff were assessed within three burned sites located on one ranch which were heavily encroached by Eastern Red Cedar.

Above ground biomass measurements were taken.

Upcoming Events

MMRPBA Annual Meeting
January 15, 2020
Location: Community Hall, Bonesteel, SD
Storm date is Jan. 22, 2020

Save the Date!
3rd Great Plains Fire Summit
Tues, Sept. 22 - Thurs, Sept. 24, 2020
Location: Ramada by Wyndham North Platte & Sandhills Convention Center, North Platte, NE

Stay connected to MMRPBA and upcoming event details:

Facebook:
https://www.facebook.com/MMRPBA/
Website:
www.MidMissouriRiverPBA.com
Email:
Contact@MidMissouriRiverPBA.com

Mid-Missouri River Prescribed Burn Association
Sean Kelly
33815 288th Street
Gregory, SD 57533

Join us

MMRPBA Annual Meeting
January 15th, 2020
Community Hall
Bonesteel, SD

Storm date: January 22, 2020

Images of a successful burn conducted on Doug Feltman's Brule County property on March 26, 2017.
Photos were taken by his granddaughter Caley Gruntmeir.

Become a MMRPBA member

See our membership form on page 6 inside!

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