Knowlton – Pine Hills
Targeted Implementation Plan

Fiscal Year 2023

Custer County, Montana

USDA-NRCS, Miles City Field Office

Summary

Improved management of ponderosa pine and Rocky Mountain juniper on rangeland is an identified priority for the Local Work Group (LWG) in Custer County and the Custer County Conservation District (CCCD). Management of these conifers is needed to address: 1) Plant Structure and Composition and 2) Wildfire Hazard from Biomass Accumulation concerns.

The overall objectives of this Targeted Implementation Plan (TIP) are to create healthy, productive, fire resilient ponderosa pine and rocky mountain juniper savannas and create conditions that allow for safer and more effective fire management. Ponderosa pine and Rocky Mountain juniper will be mechanically treated through NRCS practice Brush Management (314) and where needed, Woody Residue Treatment (384), to densities outlined in site-specific conservation plans that consider historic pre-fire suppression conditions, fire management strategies and livestock and wildlife objectives.

The signup periods will be in fiscal years 2023, 2024, and 2025. As applications for this TIP are received, producers will work with the Natural Resources Conservation Service (NRCS) and Department of Natural Resources and Conservation (MT-DNRC – Miles City - Eastern Land Office) staff to develop conservation plans specific to their goals and on-site conditions. The plans will identify treatment areas, detail treatment specifications, conservation practices, practice extents and outline monitoring and maintenance procedures. The length of each contract is expected to be less than 3 years.

Estimated total cost to fully fund this TIP over a three-year period is $1,282,000. Without funding assistance from partners, it is expected that the field office could treat 2,500 acres. The DNRC Eastern Lands Office has grant money to complete this type of work through May of 2023. NRCS and DNRC have partnered on brush management projects in Eastern Montana through the Chalk Buttes TIP in Carter County, so an approach to partnered conservation work is well established. If timelines of implementation and funding allow, NRCS and DNRC plan to partner to split the costs of projects scheduled in 2023 to treat more acres. DNRC plans to continue to apply for more grant money and may ask for an extension on the grant money they have secured if necessary.

Moving forward, DNRC, the LWG, and the CCCD wish to rotate this type of conservation planning and funding around the county to treat similar resource concerns in other areas of the county. Currently, the Moon Creek area is slated to be the next focus area for a later version of this TIP.

Geographic Focus

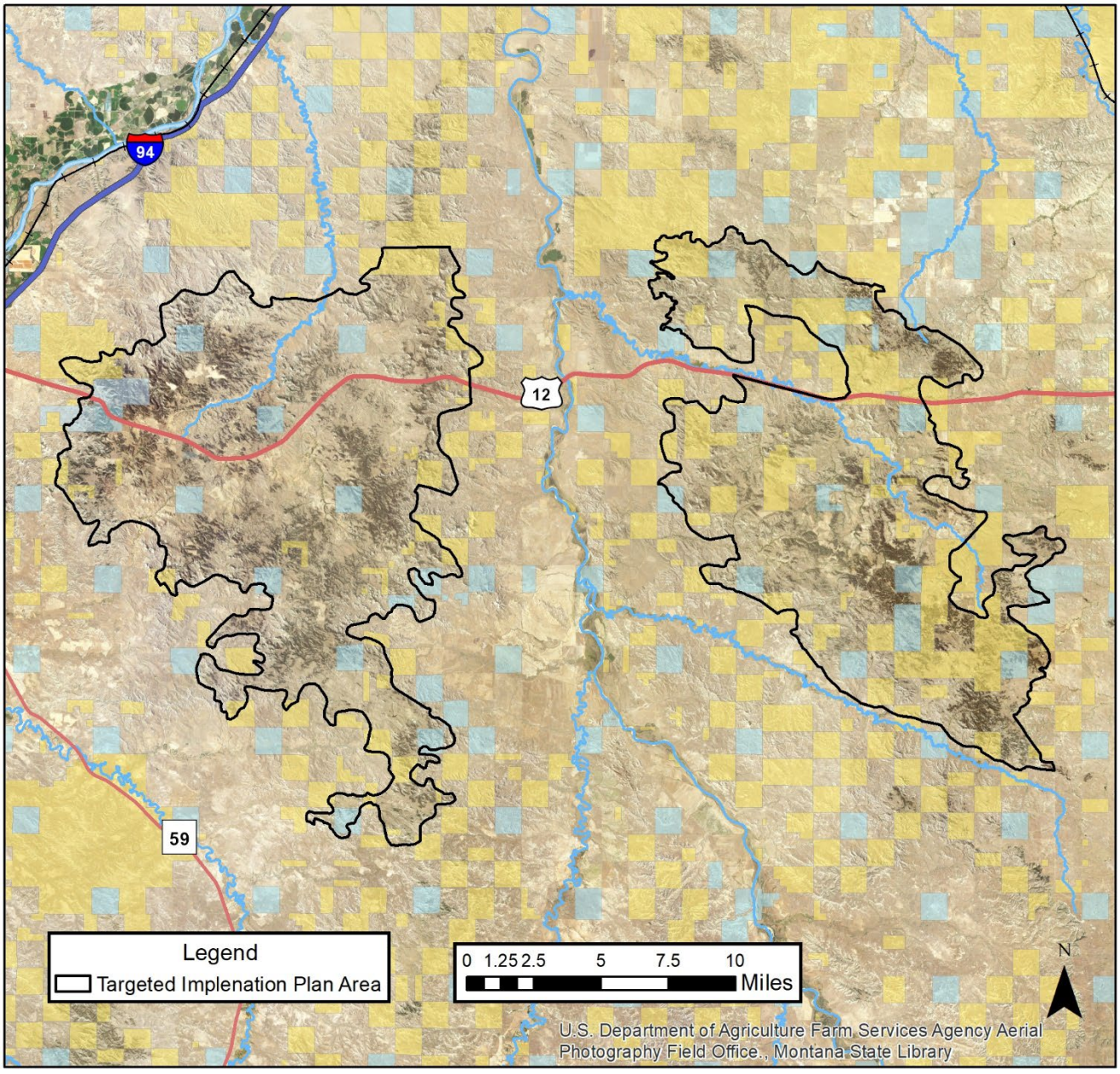
The Knowlton-Pine Hills area is a mixture of private and public lands managed by United States Department of Interior Bureau of Land Management (USDI-BLM – Miles City Field Office) and the Montana DNRC between Miles City and Ismay, Montana along Highway 12. Native rangelands in the TIP area consist of intermixed grazeable pine/juniper savannas, which are the focus of this TIP, grasslands, sagebrush steppe and badlands; all of which are dissected by drainages, riparian areas and woody draws. Livestock grazing is the primary land use. Perennial cropland (hay), pastureland, annual cropland (small grains) and ranchettes make up the remaining acreage.

Within the Pine Hills area there are a few subdivisions, including the Pine Hills Ranchettes and Wolf Creek subdivision which consists of approximately 50 residences. Additionally, there are several

communication towers that are extremely important as they provide the primary communication link for most of the emergency response systems in the Miles City and Custer County area. For these reasons, the parts of the Pine Hills are considered a priority area for fuel mitigation in the Custer County Community Wildfire Protection Plan.

The Eastern Land Office (ELO) of the MT-DNRC has led conservation efforts addressing fuels/fire safety and encroachment concerns in eastern Montana, including in the Knowlton-Pine Hills area. In 2009 the DNRC, in cooperation with the Rosebud Conservation District (RCD), applied for and received federal grant funding to conduct fuel hazard reduction projects within the ELO area. Since that time the ELO along with the RCD have continued to apply for and receive grant funding from various state and

Knowlton-Pine Hills TIP



federal funding sources to continue the conservation efforts. Together, along with significant efforts by the Custer County Fire Warden and the USDI Bureau of Land Management, they have treated 6000 acres of fuels reduction primarily in Custer, Powder River and Rosebud counties. In this area, DNRC has worked with landowners to treat 832 acres and has 120 acres slated for treatment in 2022. Currently, The ELO has approximately $288,000 of Western States Wildland Urban Interface Grant funds to be used by May of 2023.

The Eastern Land Office's efforts have also led to substantial landowner interest in doing more conservation work of this kind in the TIP area. DNRC is currently working with 11 producers to develop conservation plans and Miles City NRCS has 8 Environmental Quality Incentives Program (EQIP) applications on file for fuel reduction and encroachment projects in the TIP area. Without significant outreach efforts, the office expects upwards of 25 applications. NRCS, the LWG, and CCCD would like to build upon the existing efforts and outreach started by DNRC and if possible, pair funds in an effort to treat more acres. Consequently, the Knowlton-Pine Hills area was prioritized for conservation planning and funding in Custer County.

The total TIP area is 212,920 acres. Geospatial analysis was completed on tree cover data gathered from the Rangeland Analysis Platform to exclude areas where slope exceeds 35%, as those slopes are too steep to be considered for mechanical treatment. See Table 1 below for results. Within the TIP area there are 89,463 treatable acres of pine/juniper savannah where the tree canopy levels are over 1%. Of the 89,463 treatable acres, 7,315 acres occur on State lands, 12,882 acres occur on BLM, and 67 acres occur on land owned by Custer County; leaving approximately 69,200 acres of tree cover on private land. Approximately 180 private landowners own treatable acres within the TIP area.

The goal if this TIP is to treat a minimum of 2,500 acres. However, if DNRC receives an extension for their existing grant funds or receives additional grant money – it is likely that together, nearly 5000 acres can be treated in the 3-year timeframe of this TIP.

Tree Cover	**Treatable Acres (slopes < 35%)**
1 - 10%	41,594
10 - 19%	14,256
≥ 20%	33,613
Total	**89,463**

Table 1. Rangeland Analysis Platform data for TIP area.

Resource Concern

Locally, landowners have noticed rapid expansion (encroachment) of ponderosa pine and Rocky Mountain juniper into meadows, sagebrush-steppe grasslands, non-wooded drainages and deciduous woody draws. The LWG met in 2019 to discuss natural resource issues, concerns and priorities and conifer encroachment was identified as priority resource concerns (Custer County LRP, pages 36 & 40). Historical stands of conifers have become denser and overgrown. This is demonstrated by results from the Rangeland Analysis Program (Figures 1 & 2).

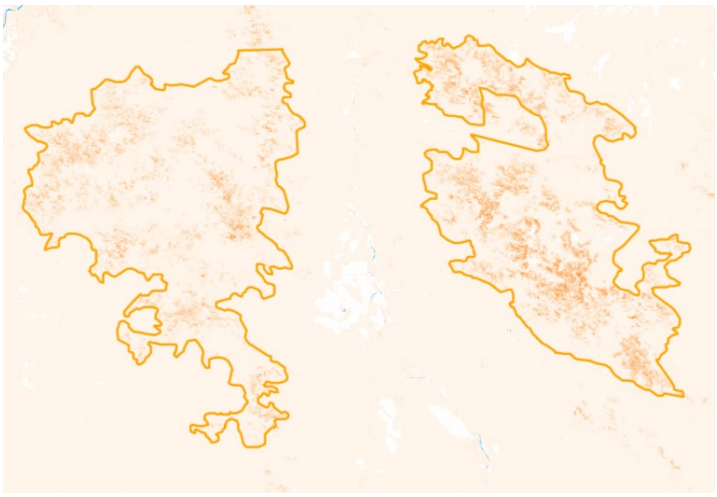


Figure 1 – 1986 Tree Canopy cover as interpolated by the Rangeland Analysis Platform (https://rangelands.app/). Red indicates tree canopy cover.

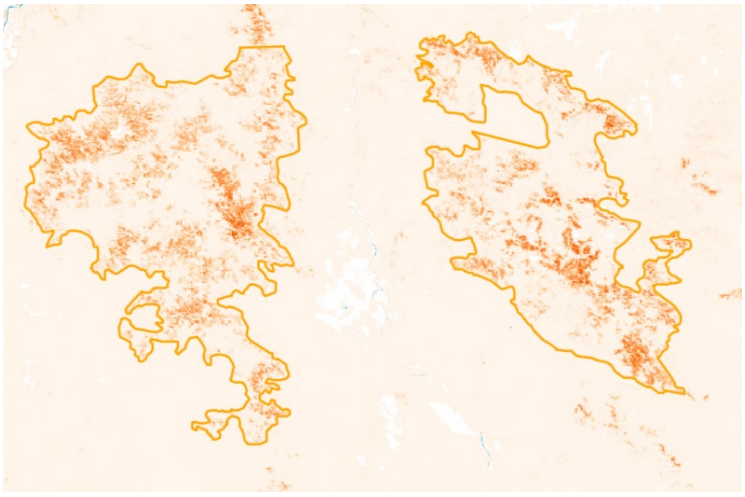


Figure 2 - 2020 Tree Canopy cover as interpolated by the Rangeland Analysis Platform (https://rangelands.app/). Red indicates tree canopy cover.

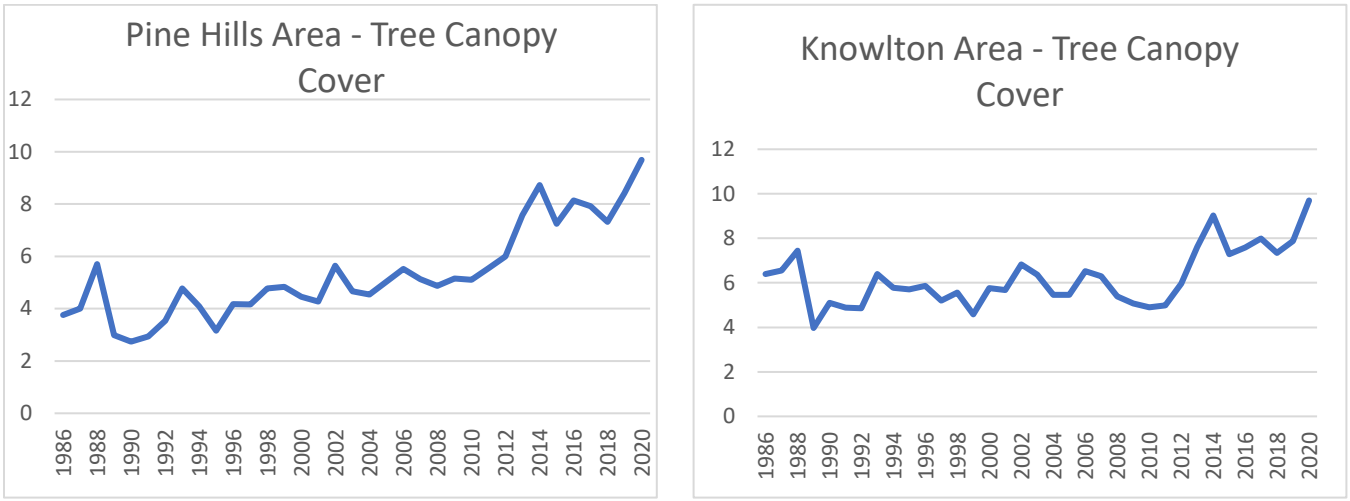


Figure 3. Tabulated results of tree canopy cover changes in the TIP Area over time as interpolated by the Rangeland Analysis Program. Within the TIP area, tree cover has been steadily increasing over time.

Modern fire suppression efforts have disrupted the natural fire regime (4–10-year fire return interval) which, historically restricted the spread of conifers and kept conifer densities at much lower levels. Understory was dominated by productive native grasses and forbs that provided high quality forage for livestock and wildlife. Wildfires mostly occurred in the understory and stand-replacing canopy fires were far less frequent than they are today.

The primary resource concern addressed by this TIP is Plant Structure and Composition. Treatments will be aimed at improving plant structure, composition and grazing land productivity. Stand densities have increased to a point where forage availability, quality and production for livestock and wildlife have been reduced. Additionally, the conifers are encroaching into meadows, sagebrush

grasslands, riparian areas and overflow sites. As a result, total livestock carrying capacity of the landscape has been negatively impacted and livestock distribution patterns have changed. Diversity of habitat structure and type and the amount of edge habitat has been reduced.

Additionally, it is well accepted that a devastating and hard to control wildlife fire in the Knowlton-Pine-Hills area is inevitable and that the likelihood of a catastrophic fire continues to increase each year. Century long fire suppression efforts have led to conifer encroachment and fuel loading. This situation, paired with a general lack of access to the area, is creating conditions that would make firefighting very difficult and expensive. Therefore, wildfire hazard from biomass accumulation is the secondary resource concern targeted by this TIP (Custer County LRP, p 42).

Livestock producers run the great risk of loss from a wildfire disaster, which would detrimentally impact the grazing lands for these ranches, along with ranch headquarters and private residences. Higher fuels tend to produce hotter fires that result in longer recovery times. As resiliency is lost, plant communities are more drastically changed by fire events. More time is needed for the landscape to regain mid- and late-seral plant communities. This makes the landscape more susceptible to wind and water erosion, noxious weeds and reduces forage availability for longer post-fire.

Fuel mitigation and fire risk concerns have also been identified by the Custer County Community Wildfire Projection Plan (CCCWPP) around the subdivisions and essential emergency response communication towers in the Pine Hills. Around 1650 acres have been outlined in the CCCWPP as priority areas for fuel mitigation projects, these areas will be prioritized for funding within this TIP.

A healthy, productive, diverse and fire resilient landscape is very important to the local economy. Livestock grazing, real estate, recreation and hunting contribute from the Knowlton-Pine Hills area significantly to the local economy.

Stand replacing fire events and pose significant risk to people, livestock, infrastructure, the local economy and public safety. Stakeholders agree that creating an environment conducive to fire management efforts is crucial moving forward. Managed fire coupled with managed grazing will be key to maintaining healthy, productive pine/juniper savannas long term.

Goals and Objectives

The overall objective of this TIP is to create healthy, productive, fire resilient ponderosa pine and rocky mountain juniper savannas in the Knowlton-Pine Hills area.

More specifically,

1) Reduce conifer densities to historical levels and remove conifers that have encroached into adjacent sagebrush-steppe, grasslands, overflow or riparian sites. Goals include: restoring the structure and composition of vegetation appropriate for each treated site, promote plant diversity, and enhance forage availability, quality and quantity for livestock and wildlife.

Before and after photos of a DNRC fuel reduction project in the Pine Hills.

2) Create defendable spaces for the purpose of fire management and control. This would include the re-creation of historic interconnected meadows, construction of strategic fuel breaks, clearing conifers away from existing roads, residences and other essential infrastructure, and include long-term management of woody biomass. Creating defendable spaces will help protect infrastructure and improve the ability of firefighters to contain wildfires.

3) Clean up thickets of "doghair timber". "Doghair" thickets consist of small (height and diameter), tightly spaced trees that shade out the herbaceous understory. The thickets create dense, complex fuel ladders that make fire management difficult. "Doghair pine" have some value to wildlife and this fact will be considered in the planning process.

4) *Create pine/juniper savannahs that are in a condition that can be maintained and more easily managed long term*. The intent of this TIP is to provide assistance to participants to complete initial treatment of selected areas. Once the initial treatment is complete, maintaining that desired state can be accomplished with far less inputs. Small trees that begin to establish post-treatment can be managed chemically, with hand-lopping, prescribed burning or with much smaller mechanical equipment.

Alternatives

Alternative 1 – Prescribed Burning.

NRCS considered using prescribed burning to remove encroached conifers and reduce tree densities. However, in most areas, fuel structure and high fuel loads prevent the use of prescribed fire as initial treatment. Prescribed burning would likely result in stand-replacing canopy fires that do not achieve the desired future condition in a reasonable timeframe. Furthermore, liability concerns and the danger of fire moving out of the intended treatment area are major risks that most agencies and landowners are not willing to take without first addressing ladder fuels and unnaturally high fuel loads. Prescribed burning may be considered as maintenance activity after initial mechanical treatment on some treatment units but is not considered a reasonable alternative for initial treatment as intended by this TIP.

Alternative 2 – Mechanical treatment of ponderosa pine and Rocky Mountain juniper through NRCS Practices: Brush Management (314) and Woody Residue Treatment (384) where needed.

Ponderosa pine and Rocky Mountain juniper will be mechanically treated through NRCS practice Brush Management (314) and where needed, Woody Residue Treatment (384) to densities outlined in site-specific conservation plans that consider historic pre-fire suppression conditions, fire management strategies and livestock and wildlife objectives.

NRCS and DNRC will partner to develop conservation, operations and maintenance plans. Conifers that have encroached into areas where it is thought that they did not historically exist before the era of fire suppression will be removed. Within historical stands, conifers will be thinned to site specific densities to meet the goals of the site. "Lop and scatter" or "pile and burn" are the two most common mechanical treatment strategies expected to be utilized. The American Bird Conservancy has agreed to help monitor slash piles post-burning for noxious weeds and to determine if re-seeding is necessary.

Alternative 2 is the chosen alternative as it will result in positive, measurable outcomes by engaging private landowners, leveraging partners, and address resource concerns to achieve desirable results. There are no foreseen obstacles or significant compliance considerations known at this time that would prevent or slow implementation.

Alternative 3 – Management of ponderosa pine and Rocky Mountain juniper through NRCS practice 381 Silvopasture.

Silvopasture was suggested for consideration for this TIP. After discussing this with our DNRC partner this alternative was not chosen. Practice 381 - Silvopasture requires at that a minimum of 20% tree canopy cover is maintained. Based on DNRC's experience and the goals of this TIP, Silvopasture was determined to not be suitable. When 20% canopy cover is left in ponderosa pine stand, the tree regeneration fills the site back in too quickly to easily maintain the treatment and forage production goals often remain unmet. Ponderosa pine stands in Eastern Montana are very dynamic; treatments vary from site to site, Silvopasture standards do not currently allow for the flexibility that is needed to create desired future outcome of most sites.

Alternative 4 – No Action

Identified resource concerns will not be addressed by the agency. DNRC and other partner efforts will continue at a smaller scale as long as funding can be secured. In areas that producers, DNRC and partners are not able to treat, conifers will continue to encroach into grasslands, shrub-steppe, woody draws and riparian areas. Herbaceous understory will continue to be lost as densities of conifers increases. Overall landscape health, carrying capacity, wildlife habitat value and post-fire resiliency will continue to decline.

Alternative 4 results in a landscape at a higher risk for stand-replacing fire events that pose significant risk to people, livestock, infrastructure, the local economy and public safety. Cost of fire-fighting activities may increase significantly. For these reasons, alternative 4 is not the selected alternative.

Implementation

Signup periods for this TIP will be in held in fiscal years 2023, 2024 and 2025. Applicants will work with NRCS and Eastern Lands Office (DNRC) staff to develop conservation plans specific to their goals and on-site conditions. The plans will identify treatment areas, detail treatment specifications, conservation practices, practice extents and outline monitoring and maintenance procedures. The length of each contract is expected to be less than 3 years.

Through the ranking process, the projects with the following criteria will be prioritized

- Treatment areas that are adjacent to existing treatment areas will be prioritized.
- Treatments that currently have an inventory and conservation plan with DNRC.
- Treatments planned on grazing land will be prioritized over non-grazed lands.
- Treatments within or adjacent to Custer County Community Wildfire Protection Plan priority areas.

Miles City Field Office staff will provide the majority of NRCS workload towards planning, implementation, and follow-up activities related to this TIP. Area office and work unit staff will assist as necessary. Additionally, the Eastern Lands Office has agreed to provide inventory, planning and implementation assistance regardless of whether they have grant funds involved.

Analysis of treatable acres per landowner in the TIP area is being conducted. Using that data, further outreach can be conducted as necessary. As mentioned earlier, DNRC has created a healthy amount of local interest, so additional outreach efforts should be minimal.

Brush management treatments will be expected to be maintained for 10 years post-treatment. After initial treatment provided through this TIP, inputs to maintain the desired condition will be reduced significantly. Conifers that start to establish post-treatment can be managed chemically, with lighter mechanical equipment, or by hand. Producers that receive funding through this TIP will receive education on proper post-treatment management. Partner assistance is being sought after to monitor and, where needed, help apply conservation practices such as herbaceous weed treatment and critical area plants to slash piles after they are burned.

Typical Conservation Plan

Practice Code	Practice Name	Cost per Unit	Units (Acres)	Estimated Cost
314	Brush Management – Scenario 1	$357.50	100	$35,750
384	Woody Residue Treatment – Scenario 6	$387.41	40	$15,496
			Total	**$51,246**

Sign Up Year	Estimated Number of Conservation Plans	Estimated Treated Acres	Estimated Cost
2023	8	800	$410,000
2024	9	900	$462,000
2025	8	800	$410,000
	Totals	**2,500**	**$1,282,000**

Partners

As mentioned through this TIP, the Eastern Lands Office of the Department of Natural Resources and Conservation has taken a lead in conservation work of this kind in Eastern Montana. The ELO has funds secured through May of 2023 to continue their efforts and plan to apply for more grants as they come available. The ELO has committed to helping with inventory, planning and wherever possible paired funding in the implementation of this TIP.

The staff of the Eastern Lands Office have been deeply involved in the planning and details of this TIP proposal. The Miles City Field Office and DNRC share a long-term vision for partnered efforts to address the targeted resource concerns throughout Custer County.

The American Bird Conservancy has agreed to help monitor slash piles post-burning for noxious weeds and to determine if re-seeding is necessary.

The Custer County Conservation District will continue to play a pivotal role in decision making, education opportunities and outreach related to this TIP.

Outcomes

Outcomes:

- In areas where the trees are appropriate for the site, create ponderosa pine savannahs comprised of healthy trees spaced at appropriate distance to create canopies conducive to the plant communities that evolved in this region.
- Removal of encroached conifers from grasslands, sagebrush-steppe, overflow and riparian sites.
- Productive and resilient herbaceous understories. Plant community structure, composition and production will closely resemble that described in the ecological site descriptions for MLRA 58A.
- Defendable spaces exist around structures and along roads for the purpose of fire management and control. Greater community and individual protection from wildfire loss and impacts.

Monitoring plots will be established as needed to measure and evaluate outcomes. At a minimum, on each conservation management unit, monitoring transects will be established in key areas to measure the response of the herbaceous understory after conifer removal or canopy reduction. The transects will measure ground cover, coniferous canopy cover, deciduous tree and shrub canopy cover and species composition of the herbaceous understory, and forage production will be estimated. The monitoring transects will serve to track the establishment of new ponderosa pine seedlings and aid in decisions regarding further treatments that may be necessary to maintain desired conditions long term.

Ranking

Question 1) Does the treatment area lie adjacent to a previously treated area?

Question 2) Does the treatment occur on grazing lands where the primary land use is livestock production?

Question 3) Does the treatment area lie within or adjacent to a Custer County Community Wildfire Protection Plan priority area?