Sheep Mountains - Lower Long Pines TIP

Figure 1 - Sheep Mountains, Carter County

Fiscal Year 2023

Carter County, Montana

USDA-NRCS, Ekalaka Field Office

Rebecca Knapp, District Conservationist

Carter County TIP Proposal – Fiscal Year 2023

Summary

Grazing land resources and wildfire resilience are local priorities in the Ekalaka NRCS Long Range Plan[1].

As of 2022, the Sheep Mountains and Lower Long Pines are overgrown with ponderosa pine and to a lesser extent Rocky Mountain Juniper. Conifers are encroaching into sagebrush grasslands (steppe), woody draws, riparian areas, and overflow sites. Native plants that evolved without extensive canopy cover are being shaded out, therefore cool season introduced grasses are invading. Ponderosa pine is so dense that it is difficult for livestock to graze the herbaceous understory. These conditions decrease the stocking capacity of the affected acres and lead to plant decadence. For wildlife, diversity of habitat structure and "edge" habitat is reduced. There is also an immense accumulation of fuel, priming the area for wildfire.

Figure 2 – Understory view of ponderosa pine encroachment

[1] Ekalaka NRCS Long Range Plan – Section IV

Moving forward, local stakeholders agree the landscape should be treated and shaped to facilitate fire management. Furthermore, they concur that planning and managing collaboratively across the mix of public and private ownership boundaries is essential. Long term, on a landscape level, managed fire and adaptive grazing management are key, post-management strategies for maintaining productive, fire resilient ponderosa pine savannas and sagebrush steppe.

The Sheep Mountains-Lower Long Pines Targeted Implementation Plan (TIP) proposal seeks to address the following resource categories: degraded plant condition and fire management, which include the following resource concerns: plant structure and composition and wildfire hazard from biomass accumulation. Rangeland is the target land use.

The TIP signup periods would be fiscal years 2023, 2024 and 2025. As Environmental Quality Incentives Program (EQIP) applications are submitted, site-specific conservation plans will be developed with the assistance of a Montana Department of Natural Recourses and Conservation (DNRC) Forester. The plan document will identify treatment areas and provide a record of conservation practices and extents. Brush Management (314) and Woody Residue Treatment (384) will treat stands of encroaching conifers. Herbaceous Weed Control (315) and Critical Area Planting (342) will address post-treatment ground disturbance, noxious weed infestations and pine tree seedling re-establishment.

Estimated total cost to fully fund this TIP over a three-year period is $1,500,000.

Looking ahead, the Local Work Group (LWG) and the Carter County Conservation District (CCCD) wish to continue rotating conservation planning and funding around Carter County to treat similar resource concerns across the larger landscape.

Figure 3 – Conifer encroachment on the Carter County landscape

Geographic Focus

Throughout Carter County, isolated high areas rise out of the prairie and are delineated from the broader sagebrush steppe landscape. These areas are locally known as the Chalk Buttes, Ekalaka Hills, Hammond, Ridge, Long Pines, Medicine Rocks, Mill Iron, Opeeche Park, and the Sheep Mountains. Management of this landscape interface has been prioritized by the LWG and the CCCD.

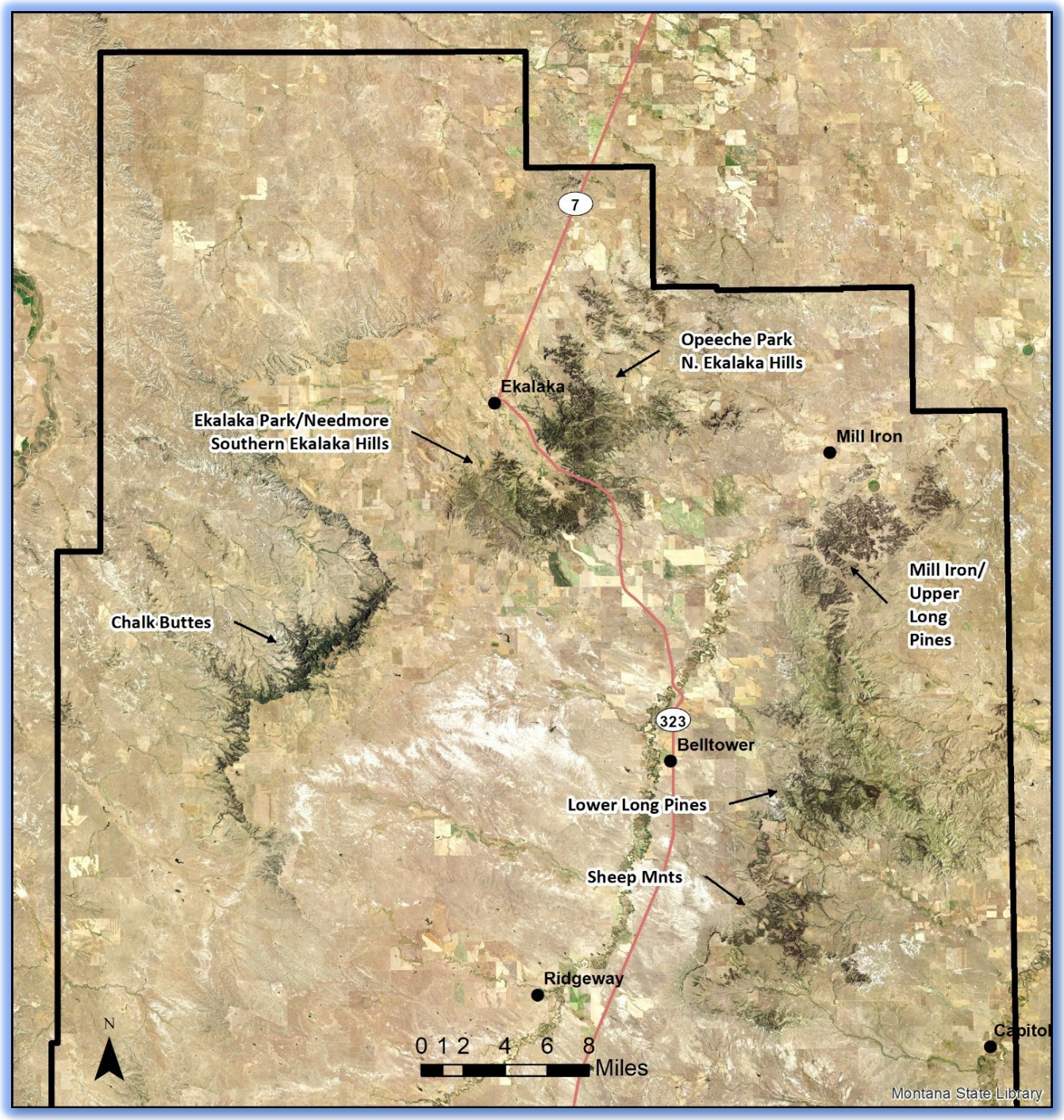


Figure 4 - Areas prioritized for treatment in northern Carter County by the CCCD and LWG.

The described area is expansive in scope with mixed ownership. There is a significant United States Forest Service (USFS) presence, with the agency managing lands within the Chalk Buttes, Ekalaka Hills, and Long Pines. There are also Bureau of Land Management (BLM) and

DNRC lands intertwined with private ownership. To focus conservation, it is necessary to break this landscape into smaller areas where work can be accomplished within specific time frames. The Chalk Buttes were prioritized first for conservation planning and funding associated with Montana NRCS Targeted Implementation Plans (TIPs). That project was funded in Fiscal Year 2021. The Sheep Mountains and Lower Long Pines have been prioritized for a 2nd Carter County TIP proposal.

The Sheep Mountains and Lower Long Pines are located south and east of Ekalaka, near Camp Crook, SD. They are remnant islands of the Arikaree geologic formation and form the western rim (edge) of the Little Missouri River Basin. The Sheep Mountains and Lower Long Pines are comprised of ponderosa pine savannah and sagebrush steppe interspersed with coulees, woody draws, and riparian areas. The area has rare beauty, diverse and unique plant communities, abundant wildlife, and value for livestock grazing and public recreation. Presently, conifer encroachment is reducing the overall quality and productivity of this area.

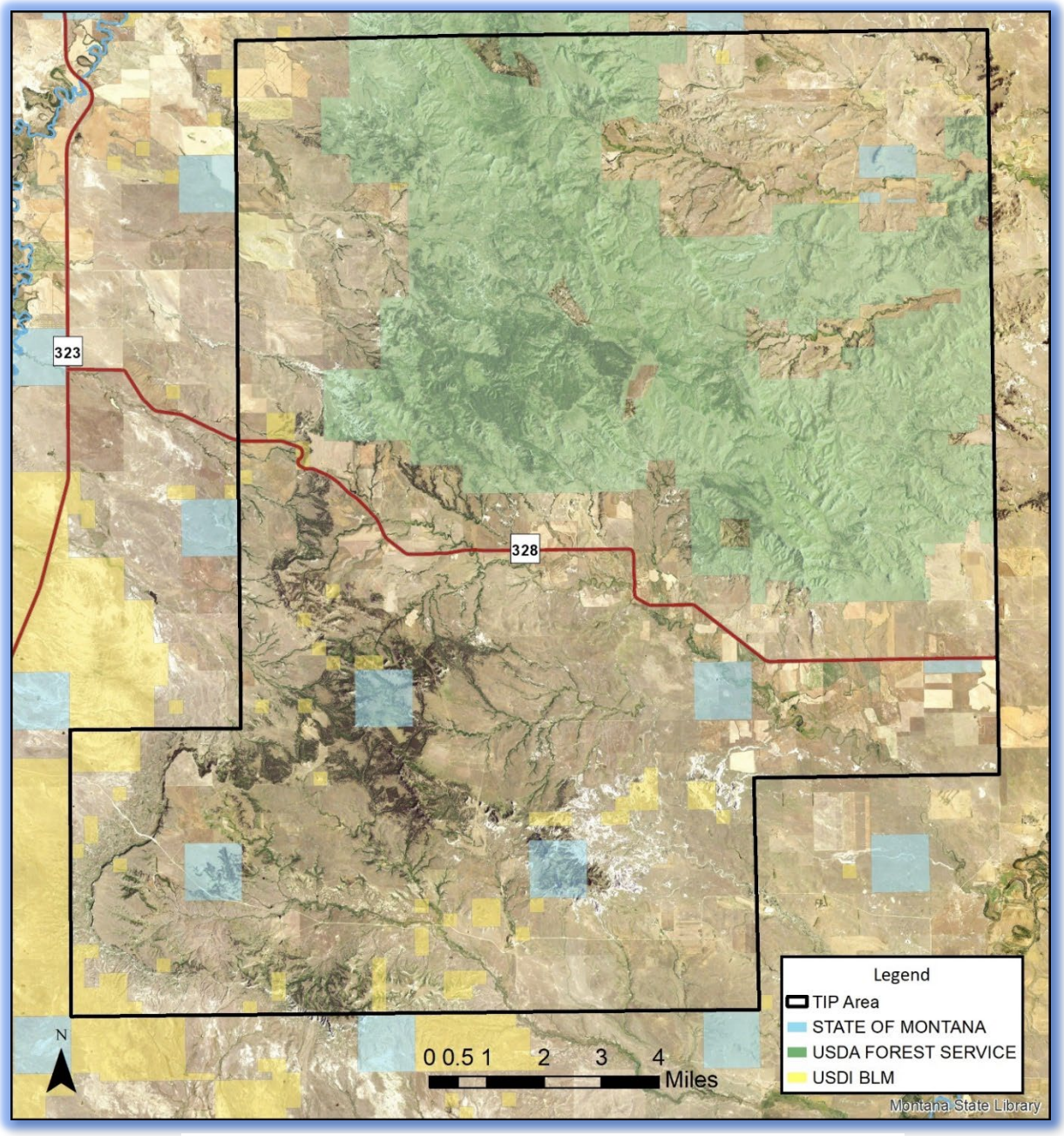


Figure 5 - Sheep Mountain / Lower Long Pine Targeted Implementation Plan Area

Scope

There are approximately 142,165 acres in the TIP boundary.

Land ownership	Acres
Private Lands	89,395 acres
USFS Lands	44,399 acres
BLM Lands	4563 acres
MT-DNRC	3808 acres

Within the TIP area there are 39 private landowners and one subdivision. The "Cabins in the Long Pines" subdivision consists of 75 acres and 13 private landowners. Protection of the subdivision is a priority in the Carter County Community Fire Plan (page 35).

Geospatially, we are estimating 60,000 acres of conifer encroachment or areas with overstocked trees in the TIP area. Of that area, 20,000 acres may be suited for treatment based on percent slope and accessibility.

Of the 20,000 acres, approximately 11,500 acres are private and DNRC lands that could be treated with TIP funds. Based on Chalk Buttes TIP trends, we are anticipating treating 4200 acres of private and DNRC lands.

The USFS is currently drafting ecotonal proposals for Forest Service lands in the Long Pines. Work in ecotonal zones will help resore the health and vigor of ecotonal habitats across the National Forest.

DNRC is working on a fuels reduction grant proposal for a more general area that would include the Long Pines and the Sheep Mountains.

The BLM is also working on fuels reduction projects in the general area.

Figure 6 - Turkey in ponderosa pine understory

Resource Concerns

The Sheep Mountains-Lower Long Pines Targeted Implementation Plan (TIP) proposal seeks to address plant structure and composition and wildfire hazard from biomass accumulation. These resource concerns were prioritized for conservation effort by the LWG and are outlined in the Ekalaka NRCS Long Range Plan (Pages 3 and 5 of Section IV).

Ponderosa pine dominates a landscape by developing enclosed canopies that restrict growth and production of the herbaceous understory. The historic fire regime, the elevations, and lower precipitation zones associated with Carter County once limited the tendency of ponderosa pine to become a climax species and spread into adjacent sagebrush steppe.

Figure 7 - Encroaching ponderosa pine developing a closed canopy

However, a local historian associates conifer encroachment with the linear increase in average annual precipitation since 1883. When graphed, the data indicates that average annual precipitation has increased from approximately 13 inches to greater than 15 inches. As 14 inches of precipitation is a minimum for ponderosa pine, it would seem logical that the species is expanding in range. [2]

Following the drought of 1988, Carter County landowners noticed rapid expansion (encroachment) of conifer species, specifically ponderosa pine (*Pinus ponderosa*) and Rocky Mountain juniper (*Juniperus scopulorum*) in historically open meadows and sagebrush steppe.

The rapid conifer encroachment is quantified by the Rangeland Analysis Program. Note the change between 2001 and 2020.

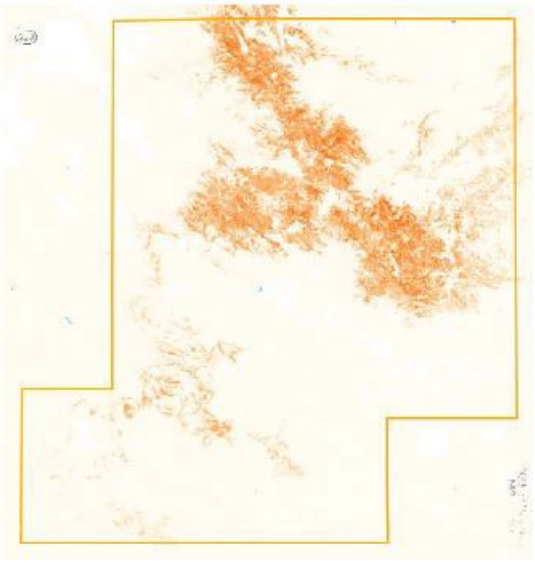


Figure 8 - 1986 Tree Cover in the TIP Area

Figure 9 - 1991 Tree Cover (after the 1988 Brewer Fire)

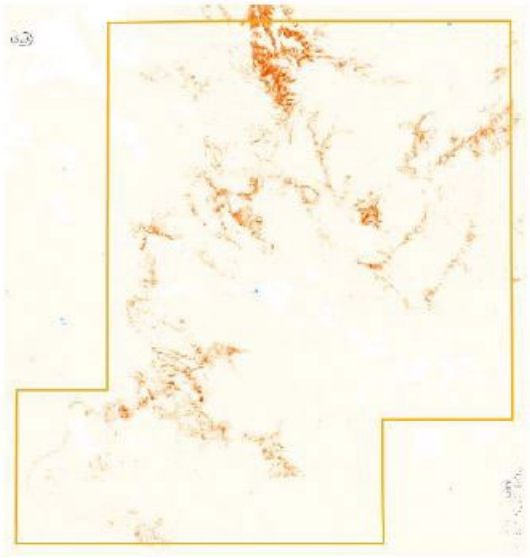


Figure 10 - 2001 Tree Cover in the TIP Area

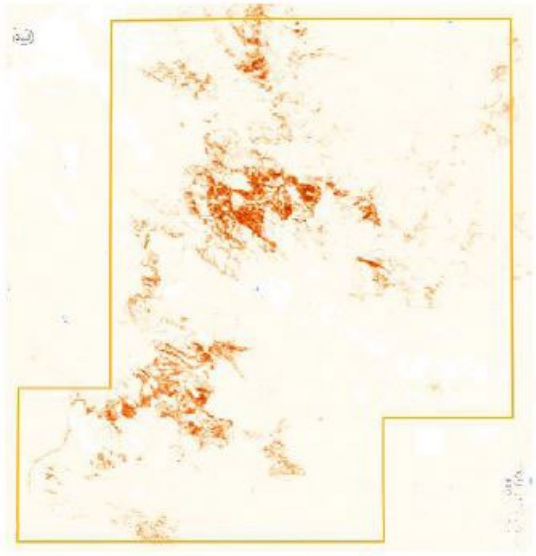


Figure 11 - 2020 Tree Cover in the TIP Area

[2] Ned Summers

In 2014, a local landowner asked the Ekalaka NRCS (Natural Resources Conservation Service) to observe conifer encroachment on property that lies south of the Long Pines and north of the Sheep Mountains. Corey Swenson, Rangeland Management Specialist from the Broadus NRCS Field Office, came over to assist. Notably, we observed over 50 ponderosa pine seedlings (4 inches or smaller) in one hoop along the edge of a woody draw. It was evident that conifer encroachment was an emerging issue.

Figure 12 - Ponderosa pine seedlings in the Lower Long Pines (2014)

Since that time, 11 additional private landowners, the USFS, the DNRC and the BLM have expressed interest in managing conifer encroachment in the Sheep Mountains and Lower Long Pines. Aside from reduced stocking capacity, all parties are concerned about catastrophic fire. Due to extensive fire suppression and fuel loading, the Long Pines have already burned extensively twice since 1988 (Brewer and Kraft Springs Fires).

Figure 13- Lower Long Pines (Fall 2021)

In the 20 years following the Kraft Springs Fire, the ponderosa pine in the Long Pines has re-established and is encroaching. Dense seedling and sapling densities threaten the integrity of the herbaceous understory, reduce forage production and forage availability and hamper fire management efforts. Downed timber, remnant of past fire events and storm damage, contributes to fuel loading and access issues.

The largest recent fire in the area was the Yates 2 Fire that burned 1,231 acres at the end of June in 2017. Several other smaller fires (<100 acres) have also occurred in this area since 2016, the most recent being the Sheep Mountain Fire on private land in September of 2021 and the Gergen Fire in 2020. Naturally caused fires in Carter County for the last five years that started on non-federal lands (2016-2021) have averaged 21 fires for 1,623 acres per year.[3]

Figure 14- Yates 2 Fire (June 2017) – Photo by Kurt Hansen (USFS)

[3] Information from the Northern Rockies Coordination Center website

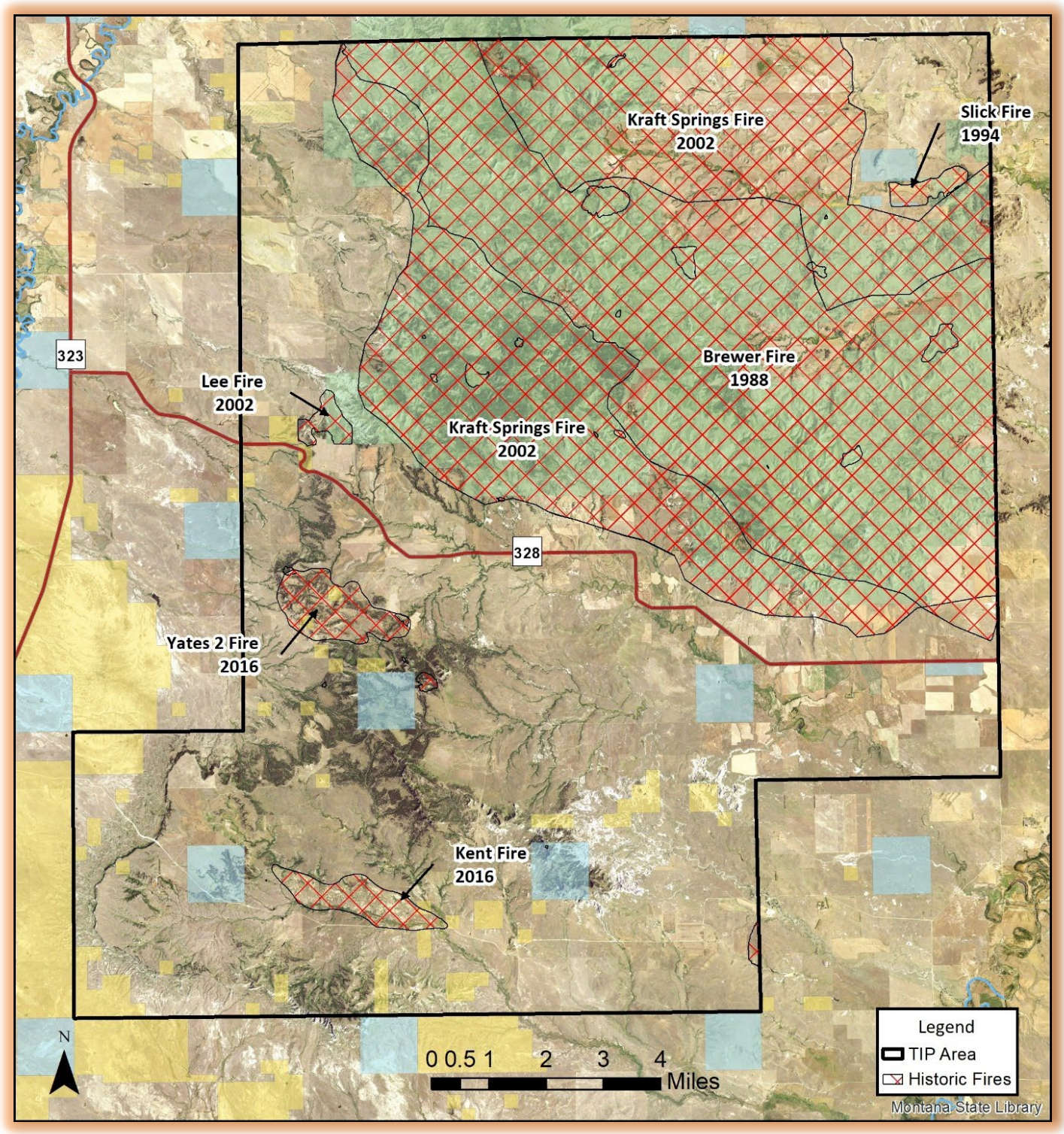


Figure 15 -Map of recent wildfires in the TIP Area

Goals and Objectives

TIP objective statement: To shape productive, fire resilient landscapes.

Alternatives

Alternative 1 – Comprehensive, RMS level conservating planning and contracting across all operating units in the TIP area. Treat all identified resource concerns.

Alternative 2– Selected Alternative. Targeted planning and contracting to treat 2 resource concerns. Mechanical treatment of ponderosa pine and juniper through NRCS Practice Brush Management (314) and Woody Residue Treatment (384) if prescribed. Herbaceous Weed Control (315) and Critical Area Planting (342) on acres where post-treatment disturbance is expected to be high and might warrant additional action.

Figure 16- Photo of mechanical treatment area – Practices 314 (Brush Management) and 384 (Woody Residue Treatment)

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. Forage production goals will remain unmet as conifers continue to expand and tree cover becomes denser. If no action is taken, the risk for catastrophic wildfire will continue to increase as fuels remain untreated.

Figure 17- Dense ponderosa pine seedlings in the Sheep Mountains

Selected Alternative: Alternative 2: Specific resource concerns can be addressed in a cost-effective manner over a shorter period. The 314 base practice complements the work other agencies are performing in this area to address fuels reduction and conifer encroachment.

Compliance considerations – Cultural resource assessments and NRCS-CPA-52's will be initiated prior to finalizing plans and contracts on private and DNRC lands. USFS will work through the ecotonal proposal process and its respective compliance considerations.

Alternative 2 - Components:

1. ***Remove conifers encroaching into adjacent habitat (sagebrush-steppe, woody draw, riparian or overflow sites)*** to restore the structure and composition of the native vegetation and promote diversity plant communities across the spectrum of the landscape.
2. ***Adequately thin and space ponderosa pine to*** **improve the structure and composition of the native herbaceous understory,** improving plant health and vigor, species diversity and forage production.

3. ***Shape the landscape for fire resilience.***

Figure 18- Prescribed burn - Photo by Kurt Hansen (USFS)

- Create defendable spaces by re-opening historic, interconnected meadows.

- *Thin and space trees* for the purpose of enhancing fire management. In stands of well-spaced ponderosa, fires are more apt to stay on the ground and burn herbaceous vegetation vs. crowning.

- Clear back from existing roads to create better access and escape routes.

- Design survivable space adjacent to existing houses and outbuildings.

- Manage fuel ladders by treating dog-hair pine thickets and trimming the lower branches on remaining trees.

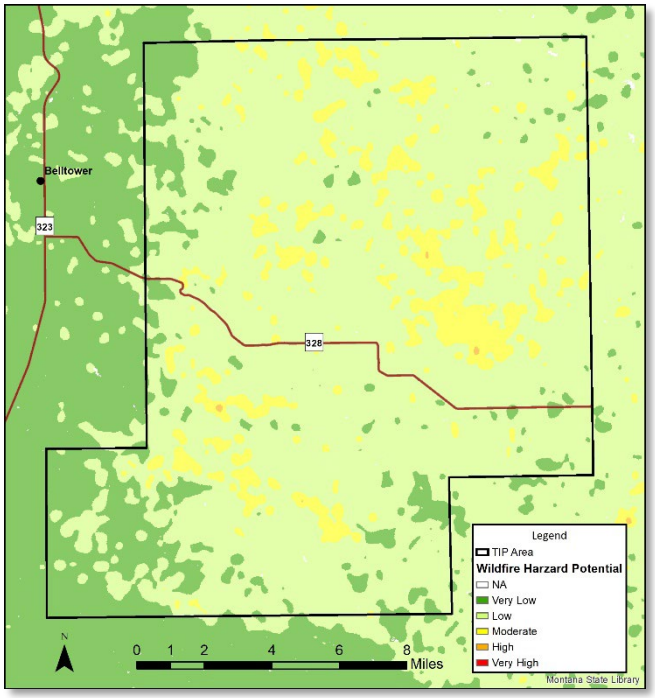
Implementation

Outreach and Timeline: No formal outreach is necessary, as there is already well-documented interest. The field office will reach out to the producer group in person, followed by a mailing. The batching periods will be in fiscal years 2023, 2024 and 2025. Implementation would begin in the fall of 2023. The most significant barrier to implementation seems to be weather. For example, fire danger in 2021 prevented crews from starting work in the Chalk Buttes.

Conservation Planning: After EQIP applications are submitted, applicants will work with DNRC staff to develop a conservation plans specific to their operating unit. The plans identify resource concerns, treatment areas, conservation practices and practice extents. When the plan is complete, it is submitted along with a plan map to the local NRCS office. Note that planning work can also be completed prior to the TIP application period. DNRC can commence planning activities early if producers request assistance.

Evaluation/Ranking: Applications will be assessed and ranked within the TIP fund pool. Ranking questions have been developed to prioritize applications in the ranking process. Priority will be given to proposed projects…

- Adjacent to existing infrastructure
- Adjacent to USFS and/or DNRC priority treatment areas
- Adjacent to other private acres proposed for treatment



The Wildfire Hazard Potential Model developed by USFS will also be used to prioritize applications[4].

Planning Staff: To this date, the DNRC Forester, Andrew Miller, has developed most of the conservation plans for Carter County producers. National Wild Turkey Federation (NWFT) is considering placing additional forestry/fuels staff positions in this area. Field and Area NRCS staff will develop and manage conservation contracts and conduct follow-up.

Funding/Contracting: Through an EQIP contract, financial assistance will be available to help local producers implement the conservation practices and respective practice extents identified in the conservation plans. If the DNRC receives a grant for this treatment area, the funds will be used in conjunction with NRCS funds to lessen the financial burden on the individual landowners. DNRC and NRCS have already paired funding in the Chalk Buttes TIP area, so there is an established funding format in place for that situation. If the producer utilizes DNRC funding, there are additional contract documents for them to sign specific to that agency's requirements.

[4] USDA-USFS, Wildfire Risk to Communities website. https://wildfirerisk.org/explore/

TIP Practices:

314 – Brush Management (Scenarios 1, 2)

384 – Woody Residue Treatment (Scenario 6)

315 – Herbaceous Weed Treatment (Scenario 3)

342 – Critical Area Planting (Scenario 36)

Budget - Total Requested: $1,500,000

Examples: *This budget assumes that DNRC grant funding will be available to cover 384 (Woody Residue Treatment – Scenario 6)*

1000 acres

Practice Code	Practice Name	Cost per Unit	Units (Acres)	Estimated Cost
314	Brush Management	$357.50	1000	$357,500.00
384	Woody Residue Treatment	$387.41	300	$116,223
315	Herbaceous Weed Treatment	$93.57	50	$4,678.50
342	Critical Area Planting	$132.41	5	$662.05
			Total	**$479,063.55**

500 acres

Practice Code	Practice Name	Cost per Unit	Units (Acres)	Estimated Cost
314	Brush Management	$357.50	500	$178,750.00
384	Woody Residue Treatment	$387.41	150	$58,111.50
315	Herbaceous Weed Treatment	$93.57	50	$4,678.50
342	Critical Area Planting	$132.41	20	$2,648.20
			Total	**$244,188.20**

250 acres

Practice Code	Practice Name	Cost per Unit	Units (Acres)	Estimated Cost
314	Brush Management	$357.50	200	$71,500.00
314	Brush Management	$119.97	50	$5,998.50
384	Woody Residue Treatment	$387.41	60	$23,244.60
315	Herbaceous Weed Treatment	$93.57	5	$467.85
342	Critical Area Planting	$132.41	1	$132.41
			Total	**$101,343.36**

50 acres

Practice Code	Practice Name	Cost per Unit	Units (Acres)	Estimated Cost
314	Brush Management	$357.50	50	$17,875.00
315	Herbaceous Weed Treatment	$93.57	1	$93.57
342	Critical Area Planting	$132.41	1	$132.41
			Total	**$18,100.98**

Budget Timeline (Scheduled Obligations):

2023 – 5 contracts	2024 – 10 contracts	2025–5 contracts	2026	2027
$450,000	$650,000	400,000		
			Total	**$1,500,000**

Partners

In 2019, the Carter County Conservation District and Ekalaka Field Office staff met with the Montana Department of Natural Resources and Conservation (DNRC) Forester, stationed at the Eastern Land Office - Miles City, MT, to discuss ponderosa pine management and potential state funding sources. DNRC's management and planning philosophies were communicated, example plans presented, and potential fund sources explained.

On July 22, 2020, there was a joint meeting between the CCCD, USFS, DNRC and NRCS. We discussed the Chalk Buttes TIP proposal and deliberated the future course of conifer encroachment management in Carter County. Since that time, the DNRC has received 2 grants for hazardous fuels reduction in the Chalk Buttes. With the first grant monies, the DNRC Forester established an area in the Chalk Buttes which will be used to demonstrate fuels mitigation and management of conifers to a larger audience.[5] The second grant is being used in conjunction with NRCS funds to cost share brush management in the Chalk Buttes TIP area. *DNRC plans to seek additional grant dollars to fund fuels reduction projects in the general Long Pines area, which would include the Sheep Mountains.*

To this date, the DNRC Forester has developed all management plans for producers in the Chalk Buttes TIP area. The Forester also provides technical assistance for implementation. NRCS is responsible for producer outreach, facilitating the release and sharing of base information for planning purposes, EQIP contracting and contract maintenance (payments, modifications, etc.).

The USFS continues to lend strong technical support to the TIP process. The agency is interested in partnering with this project, the idea being that NRCS could assist landowners with management of private, acres and the Forest Service could then prioritize management on neighboring public acres, creating a greater, contiguous landscape level impact. The USFS is currently working on present and proposed tree thinning projects along existing roads in the management unit.

In September of 2021 the Custer Gallatin Forest Announced the Ecotonal Habitat Restoration Project Decision, which is an opportunity for the agency to propose ecotonal work specific to woody draw regeneration and meadow restoration. This would facilitate fuels mitigation while simultaneously promoting the restoration of ecotonal habitats. The Forest Service is also

[5] Andrew Miller. Forester. DNRC – Eastern Lands Office, Miles City, MT.

working with DNRC and BLM. [6] The District Ranger – Custer Gallatin National Forest - Sioux Ranger District - Camp Crook, SD, is the primary contact.

National Wild Turkey Federation would consider partnering with USFS to enhance the deciduous draws. [7]

Presently there is tremendous local interest in the project. Landowners from other areas in the county are supportive as well and have inquired about beginning work on similar proposals.

PARTNER	CONTRIBUTIONS
CARTER COUNTY CONSERVATION DISTRICT (CCCD)	• **Local Work Group** • **Long Range Plan** • **Project prioritization** • **Local support** • **Possible grant administration**
CARTER COUNTY	• **Fuels mitigation grant monies**
MONTANA DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION (DNRC)	• **Grant monies** • **Boots on the ground for NRCS and possibly BLM and USFS** • **Fuels mitigation expertise** • **Conservation plans**
UNITED STATES FOREST SERVICE	• **Ecotonal proposals on adjacent lands** • **Plan, treat and fund similar treatments on adjacent USFS acres.**
BUREAU OF LAND MANAGEMENT	• **Fuels mitigation grants** • **Plan, treat and fund similar treatments on contiguous BLM acreages.**
NATIONAL WILD TURKEY FEDERATION	• **Potential fundraising**

Outcomes

By September of 2021, the estimates were rolling in. Montana had already spent $54 million of its Fire Suppression Fund to manage wildfires. 900,000 acres of land had been charred, 51 homes destroyed, and the fire season wasn't over yet.[8]

Annually, catastrophic wildfire takes an incredible toll on Montana's resources. With that in mind, Carter County wishes to plan and manage the landscape comprehensively and collaboratively to improve plant structure and composition while managing fuels to reduce wildfire hazard.

[6] Kurt Hansen. District Ranger. Forest Service. Custer Gallatin National Forest. Sioux Ranger District
[7] Collin Smith. Certified Wildlife Biologist, District Biologist. National Wild Turkey Federation. Livingston MT
[8] Freddy Monares. Montana Public Radio. Published September 15, 2021

Working together, we believe we can achieve the following....

1. Ponderosa pine savannahs comprised of healthy trees spaced at appropriate distance to create canopies conducive to the plant communities that evolved in this region.

2. Protection of biologically important segments of the landscape, threatened by conifer encroachment. For example, sagebrush-steppe, overflow sites, riparian areas and woody draws.

3. Productive and resilient herbaceous understories. Plant community structure, composition and production will closely resemble that described in the ecological site descriptions for MLRA 58A.

4. Fire resilient landscape. The Carter County landscape evolved with a frequent fire interval. However, fire suppression has created a landscape primed for catastrophic fire. Fuel treatment analysis platforms, such as STANDFIRE, demonstrate how fuels mitigation projects shape the landscape, reducing fuel loads and diminishing ladder fuels. We hope to use landscape level modeling in the future to assist with planning and analyzing fuel treatments.

Figure 19 - Carter County landscape view –Photo by Kami Kilwine (2021)

Evaluation of outcomes - 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 to ponderosa pine canopy reduction. The transects will measure ground cover, coniferous canopy cover, deciduous tree and shrub canopy cover, species composition of the herbaceous understory and forage production. 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 meadows and fuel breaks long term

Figure 20- Ekalaka Hills - forage response one-year post-treatment

Ranking Questions

Is the treatment area adjacent to existing infrastructure (residences, outbuildings, radio towers, roads, etc.)?

Yes

No

Are the offered acres adjacent to USFS or DNRC lands that are prioritized for treatment?

Yes

No

Are the offered acres adjacent to private acres also being considered for treatment?

Yes

No

What is the highest Wildfire Hazard Potential rating within the treatment area(s)?

High

Moderate

Low

Very Low