Photo credit: Jenney Paddock, July 2015

Improving Grazing Land Health in the Smith River Valley Phase II

FY24-FY26

United States Department of Agriculture

Jenney Paddock

District Conservationist
White Sulphur Springs, MT

TIP SUMMARY

As part of Montana's Natural Resources Conservation Service (NRCS) focused conservation efforts, this Targeted Implementation Plan was developed to address the priority resource concerns identified by the Meagher County Local Work Group outlined in the White Sulphur Springs Field Office's Long-Range Plan. Plant productivity and health on rangeland has been Meagher County's long-standing priority resource concern.

Eighty-one percent of Meagher County is grazing land and/or grazeable forestland. Ranching is one of the most important contributors to the county's economy.

Phase 2 was chosen as the 2nd location to work because of interest from landowners. Phase 1 began implementation in 2022. Although phase 2 is in the valley between the Little Belts and Big Belts the plant productivity and health concerns are nearly identical to the horsefly project and is described well in the Horsefly Vegetation Project assessment. The Horsefly project is currently being implemented on Forest Service land.

From the Horsefly Vegetation Project's preliminary Environmental Assessment:

A landscape assessment was completed for the Little Belt Mountains in 2014 that identified management opportunities from the perspectives of vegetative restoration and wildfire threat reduction. The assessment noted the existing vegetation has departed from historical conditions, in both composition and structure, due to the interruption of the historic natural fire cycle over the past century. Forest conditions in the intermountain region, including the Horsefly Vegetation Project area, were largely influenced by fire; both natural and human-caused. In his 1904 report on historic forest conditions within the Little Belt Mountains Forest Reserve[1], Leiburg states "no large area of the reserve has remained untouched by fire during the last one hundred and fifty years." (Leiberg, 1904). At that time, he observed the forest was dominated by sapling to pole sized Douglas-fir and lodgepole pine across 79% of the area.

There have been relatively few acres burned in the Little Belts since Leiberg's review. Today, forests are increasingly dominated by stands in the later development stages, with greater proportions of shade tolerant species, higher stand densities, and conifer encroachment in forest openings.

The private land surrounding the forest service would have historically had sparse timber. Encroachment has been happening over the past 120 years to varying degrees across the landscape. Livestock grazing has been an important land use since the late 1800's. Carrying capacity of the rangeland decreases as timber cover increases.

Producers seeking NRCS technical and/or financial assistance will have the opportunity to add needed infrastructure and complete thinning or remove trees from grasslands in order to implement a grazing rotation that will improve the health, productivity, and resilience of grazinglands.

Table 1. *This is a table of the estimated cost of Phase 2 of the project over the years. FY23 EQIP rates.*

Fiscal Year	Total Projects	Total Acres	Total NRCS Financial Assistance (est.)
2024	1	6,000	**$260,000**
2025	3	18,000	**$780,000**
2026	3	18,000	**$780,000**
Total	**7**	**42,000**	**$1,820,000**

GEOGRAPHIC FOCUS

Phase 2 of the Smith River Grazingland Health Targeted Implementation Plan is in the northwest corner of Meagher county with the Smith River as its East Boundary.

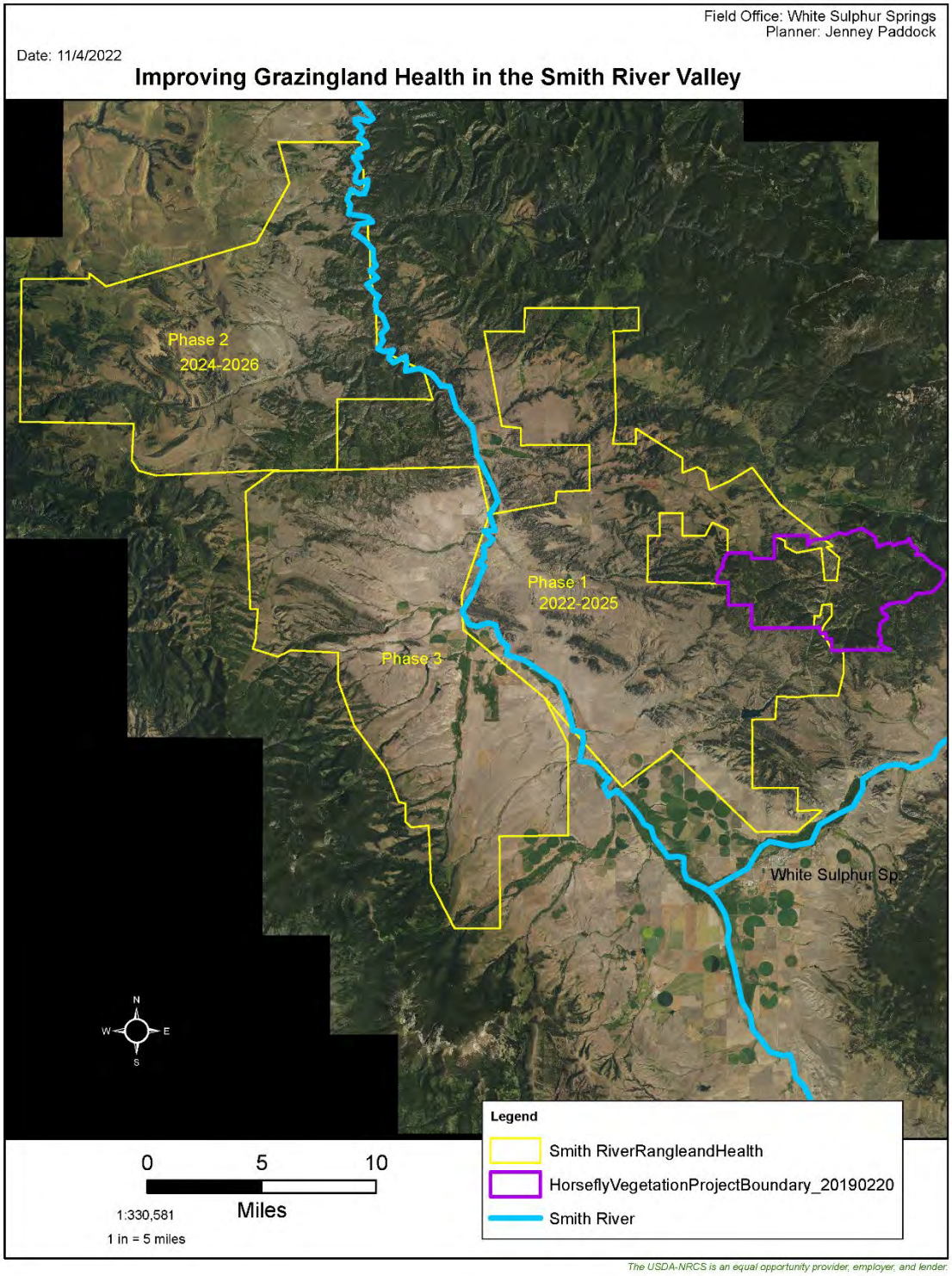


Figure 1. *Locations of Phases 1, 2 and 3 of the Smith River Grazingland Health Targeted Implementation Plan. Horsefly project is currently being implemented by the US Forest Service. See Table 4 for project specifics. Phase 2 is 93,800 ac is size.*

RESOURCE CONCERN

Plant productivity and health has been in decline within the focused area from continual use patterns combined with a lack of grazeable forest management. On lower elevation grazing lands spring and early summer grazing on an annual basis can be very hard on native grasses. On average, native grassland similarity index is 30%, meaning native grasses are producing 30% of their potential (Figure 2). On upper elevation grazinglands the lack and fear of fire has resulted in conifer encroachment on native rangeland and overstocked, dense forest. Lack of infrastructure, such as stock tanks and fences in some places, has led to a decline in habitat and vegetation on riparian areas (Figures 3 and 4). Heavy utilization of rough fescue grasslands shifts the grass species to smaller statured grass species such as Idaho fescue, reducing the amount of forage available for grazing. Ranches within this focus area are unable to use their land in the most productive and sustainable manner given the lack of infrastructure and management opportunities.

As a result of fire suppression over the last 100 years, we have seen dramatic increases in forest stand density and stocking rates across Meagher County. Additionally, conifers have encroached into rangelands throughout the county, decreasing available forage and shrinking meadow habitat for wildlife. We have passed the point of allowing nature to reclaim its historic fire regime on forest and rangelands, and now we need to carefully implement management actions to restore healthy ecosystems. It is projected that we would need to increase fire regimes by at least 3 to 7 times to return our forests and rangelands to natural fire regime conditions.

There is no true substitute for restoring a fire regime back into a landscape, but one tool that is helpful to mimic these natural disturbances is fuels reduction through thinning and removal of woody vegetation. This solution does not simulate all the ecological processes of fire but is often the choice of private landowners not willing to risk the liability of prescribed fire.

The primary resource concern is plant productivity and health. Trees on forestland are unhealthy and diseased because fire suppression has led to timber stand overgrowth and pest proliferation. Understory forage production is less than expected for the forested ecological sites due to excessive overstory shading. Conifers are encroaching into ecological sites that were historically rangeland, causing 50-750 lb/ac loss of forage production for livestock and wildlife (Figures 5- 8). Conifers are an invasive plant on these ecological sites. Areas of conifer encroachment have 10-5000 trees/ac.

***Figure 2**. Excellent rangeland health site in the Smith River Valley. Rough fescue (pictured here) is a very palatable, nutritious and productive native grass. It is susceptible to over grazing because of its palatability and its high growth points. Overall rough fescue grasslands have been reduced. Photo credit: Jenney Paddock*

RANGELAND WITH SPARSE VEGETATIVE COVER

***Figure 3**. Overutilization of riparian area. Non palatable weeds are given a competitive advantage over grasses. Banks are not well covered by perennial deep-rooted vegetation leading to bank sloughing. Photo credit: Paddock 2020*

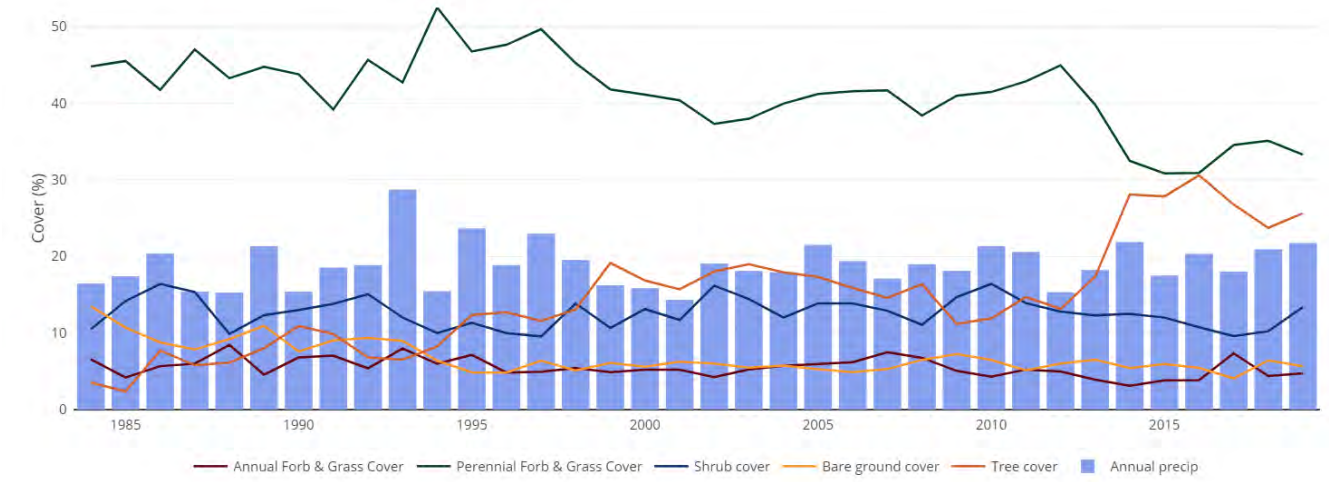
***Figure 4**. Over-utilization (left photo) year after year leads to smaller statured and less palatable plant species. Rangeland far from available drinking water (right picture) can be under-utilized. These two sites are less than a mile from each other on the same ranch. Photo credit: Jenney Paddock*

***Figure 5.** Encroachment within the TIP, young Douglas fir and Rocky Mountain juniper growing out into rough fescue grasslands. Photo credit: Paddock 2020*

Figure 6. *Example of encroachment within the TIP, young Douglas fir is growing out into the grasslands and sagebrush grassland. Photo credit: Paddock 2020*

Figure 7. *Douglas fir with >1000 trees/ac growing in sagebrush grasslands, these are areas silvopasture could be used to thin and remove dead and dying trees. Photo credit: Paddock 2020*

Figure 8. *From Rangeland Analysis Platform for location within Smith River Grazingland Health TIP. This figure represents a higher elevation pasture (5,800'-6,600') adjacent to the forest service boundary. The increase in tree cover and reduction in perennial grass cover appears significant. Additional RAP graphs and figures are in the Appendix.*



Montana Fish Wildlife and Parks' main concern with conifer encroachment in the Smith River Valley is loss of productive ungulate winter range for Elk and Mule deer. The loss or degradation of low/mid elevation native grasslands is a real concern as forage quantity and quality is significantly reduced under a forest canopy. Bunchgrass dominated montane grasslands are susceptible to conifer and shrub encroachment; prescribed burns or conifer removal and proper grazing management can help maintain this system. Associated Species of Greatest Conservation Need include Loggerhead Shrike, Preble's Shrew, Merriam's Shrew and Dwarf Shrew. Ground nesting grassland songbirds likely to be impacted by the loss or degradation of these native grasslands include Western Meadowlark and Vesper Sparrow. Montane grasslands also provide vital foraging areas for raptors including Golden Eagle, Great Gray Owl, Northern Goshawk, Northern Harrier and Short-eared Owl.

These conditions exist throughout the Smith River watershed and a phased approach will be used to implement rangeland health improvement across the watershed. Phase 1 is in implementation now, Phase 3 will be proposed in the future.

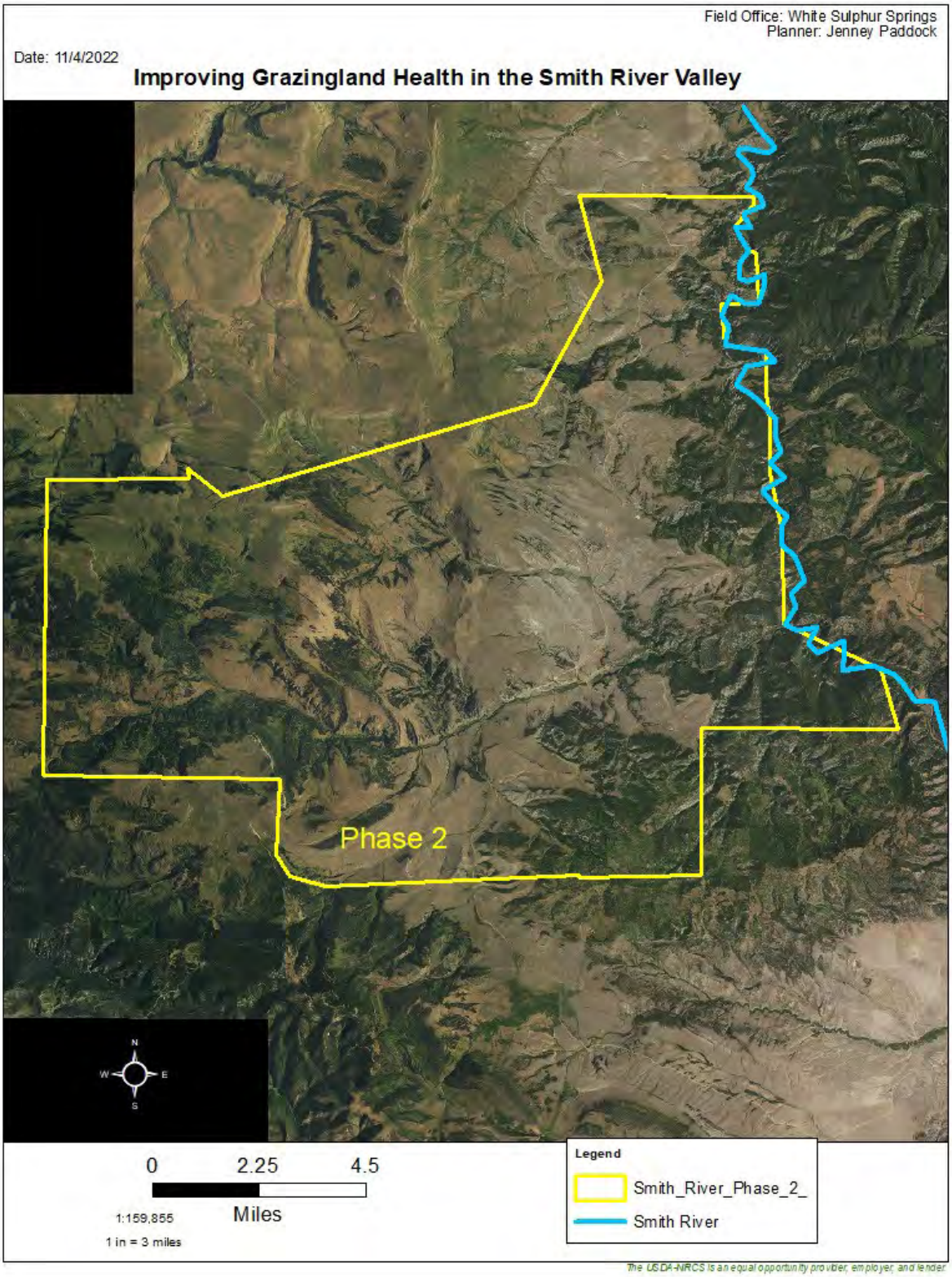


Figure 9. Project boundary for Smith River Grazingland Health Targeted Implementation Plan Phase 2.

GOALS AND OBJECTIVES

Livestock operations are inherently subject to countless impacts outside of the ranch's control – prices, markets, weather, and natural disasters to name a few. Tree encroachment into grasslands has happened over the past 150+ years. This has slowly reduced livestock stocking rates on grazeable forestland. This also reduces habitat for grassland dependent wildlife. If encroaching trees are removed from grasslands and a ranch is established with the necessary infrastructure, grazingland management is one thing that can be controlled. Managing grazinglands including rangeland, pastureland and grazeable forestlands to be productive, healthy, and resilient is the single most important thing a livestock producer can do to keep their operation profitable and sustainable. Investing in grazing management is one of the most foundational and consequential conservation practices available to the agency and its partners – the ecological benefit of healthy grazinglands cannot be understated. This primary goal of this TIP has been taken directly from Meagher County's Long-Range Plan, and the specifics were developed based on recent conservation district member input, being incorporated to make the goal timely and relevant to the producers in the TIP area.

Overall Goal

Rangeland Plant Productivity and Health

Meagher Counties long standing priority resource concern according to the local work group.

Producers seeking NRCS technical and/or financial assistance will have the opportunity to add needed infrastructure and timbered rangeland enhancement practices in order to implement a grazing rotation that will improve the health, productivity, and resilience of grazinglands. This will ultimately make their operations more profitable and economically viable, and resilient through droughts and natural disasters such as fire and pest infestations.

Conservation Plan Objectives

Pastureland: Improve the ecological function of the enrolled acres, demonstrated by a Pasture Condition Score (PCS) of 45 or higher on the offered acres, through improved grazing management and facilitating practices. By rating key indicators and causative factors common to all pastures, pasture condition can be evaluated and the primary reasons for a low condition score identified.

Rangeland: Create a positive rangeland trend on offered acres through improved grazing management and facilitating practices. Specific long-term goals and monitoring methods for

each grazing unit will be developed based on benchmark conditions and planned management. Line-point intercept and photos will be used in conjunction with the Rangeland Health Worksheet to determine results.

Riparian: Where applicable, create a positive riparian trend as documented by permanent photo points and the MT-2 Riparian Assessment in conjunction with the Rangeland Health Worksheet. Specific long-term goals and monitoring methods for each grazing unit will be developed based on benchmark conditions and planned management.

All Land Uses: Significantly improve proper grazing utilization within each grazing unit. Utilization mapping may be used to document and monitor results. The Rangeland Analysis Platform (RAP) will be used as a support tool.

PROPOSED ALTERNATIVES AND ACTIONS

To solve the problem, multiple alternatives have been considered. These include:

ALTERNATIVE ONE – LIVESTOCK WATER NO PRESCRIBED GRAZING (528)

Conifers will continue to grow out into the rangeland reducing overall plant productivity. Rangeland utilization will be made more even across a field. Without ensuring the stocking rate is appropriate for each field overgrazing can now occur across the whole field instead of just near original water sources. Plant productivity and health is not improved. This does not meet the intent of the TIP.

ALTERNATIVE TWO – PRESCRIBED GRAZING (528) AND FACILITATING PRACTICES

Develop conservation plans/agreements that provide livestock water and other necessary facilitating practices to implement a grazing rotation that improves the health, productivity, and resilience of grazinglands and grazeable forest, ultimately making the operation more profitable and economically viable, even during droughts and natural disasters. A whole-ranch view of the grazing rotation will be encouraged during planning, though not necessarily included in agreements.

The conservation practices listed in Table 2 will be available for financial assistance through this TIP. Livestock water and fences will be available as facilitating practices for prescribed grazing management. The listed practices are necessary to treat the resource concern of Plant Productivity and Health. If only stock water and prescribed grazing were contracted, small trees growing in the grasslands would continue to grow and reproduce further shading grasses and

reducing plant productivity and health. Conservation plans may include technical assistance for necessary or desired practices not included in the funding proposal, such as: livestock shelters, pasture or range plantings, temporary electric fence and upland wildlife management.

To accomplish the stated goal, management plans will be developed for each enrolled grazing unit. Management plans will include formal monitoring processes, drought contingency strategies, wildlife considerations, and environmental evaluations (CPA 52).

ALTERNATIVE THREE – NO ACTION

Conifers will continue to grow out into the rangeland reducing overall plant productivity. Rangeland will continue to be over-utilized in some locations and under-utilized in other locations.

PROPOSED SOLUTION

The proposed solution is Alternative Two.

Table 2. *Core conservation practices and payment rates. FY23 EQIP rates.*

Core Practices	Payment Rate	Unit
Fence (382)	$2.39	ft
Water Well (642)	$60.96	ft
Livestock Pipeline (516)	$1.97	ft
Watering Facility (614)	$2.59	gallon
Pumping Plant (533)	$5699	ea
Spring Development (574)	$4350	ea
Brush Management (314)	$125	ac
Woody Residue Treatment (384)	$379	ac
Herbaceous Weed Treatment (315)	$55.89	ac
Prescribed Grazing (528)	$1.46	ac
Upland Wildlife Habitat (645)	$16.99	ac
Aquifer Flow Test (224)	$1420	ea
Silvopasture (381)	$368	ac

IMPLEMENTATION

Phase 2 of this TIP will offer signups in three consecutive years – 2024, 2025, and 2026. Contract lengths are expected to be 1-5 years, with only prescribed grazing, or herbaceous weed control in the last years of the contract. Including prescribed grazing in the TIP is essential for landowners who are not meeting their potential plant productivity because of grazing practices. NRCS time spent implementing prescribed grazing and herbaceous weed control will be minimal after good upfront planning. Projected NRCS costs for the project are shown in Table 1. If interest is significant additional years may be needed. Phase 3 of the Smith River Grazingland Health Targeted Implementation Plan may be submitted after 2024 (Figure 1).

The Meagher County NRCS Field Office, in conjunction with the Livingston Work Unit, will complete the needed work to put together conservation plans, contracts and engineering designs to complete this TIP. Table 3 shows the practices and costs for a typical contract. There is currently interest from at least 2 producers within the Phase 2 implementation area to complete projects. More interest will be garnered by sending out letters, writing articles for the local newspaper and visiting with ranchers and landowners within the TIP. At least one grazingland health workshop will be held. There are 93,800 acres within the TIP boundary and we are aiming to have conservation plans on 42,000 acres in 3 years.

Table 3. *This is a table of costs of common practices that will be applied within one Smith River Grazingland TIP. FY23 EQIP rates*

Cost Estimate Breakdown for Average-Sized EQIP Contract				
Practice	**Cost Per Unit**	**Unit**	**Extent**	**Cost Per Practice**
Fence: Barbed/Smooth Wire	$2.39	Ft	10560	$25,238
Brush Management	$125	Ac	500	$62,500
Woody residue treatment	$380	Ac	150	$57,000
Photovoltaic-Powered Pump <250 TDH	$5,700.00	HP	1.25	$7,125
Pumping Plant: Well pump test	$1,420.00	Ea	1	$1,420
Watering Facility: 1500 gallon stocktanks (6)	$2.59	Gal	12000	$31,080
Watering Facility: Storage tank	$1.20	Gal	5000	$6,000
Livestock Pipeline: Buried	$1.97	Ft	18480	$36,406
Water Well: Typical Well, 100 to 600 ft depth	$60.96	Ft	350	$21,336
Prescribed Grazing – Range Standard (3 years)	$1.46	Ac	5500	$8,030
Silvopasture	$3.68	Ac	150	$552
				$256,687

PARTNERSHIPS

- Meagher County Conservation District will help with outreach via phone calls and in-person visits.
- Meagher County Weed District will apply for a DNRC weed grant within the project boundary for Phase 2 with the agreement that NRCS will provide cost share for follow up treatment the years following. It is estimated that the grant request will be around $20,000 and require the participating landowner to provide a 50% match. It is estimated that the weed department would complete 120 hours of work to obtain and implement this grant.
- MT Fish Wildlife and Parks has supplied wildlife information and will help with outreach.
- The Helena-Lewis & Clark National Forest will complete pre-commercial thinning, meadow restoration, and prescribed burning on adjacent public land. There is the potential for the forest service to carry some of their burns onto private land where landowners are interested in burning.

Table 4. Vegetation Treatment Acres – *Proposed Action treatment and acres from Horsefly Vegetation Project Preliminary Environmental Assessment. Estimated cost provided by Lisa McDonald Assistant Fire Management Officer fuels Helena-Lewis and Clark National Forest.*

Vegetation Treatment	Proposed Action Acres	Estimated Cost/Acre	Total
Intermediate Harvest	3,695	unknown	
Regeneration Harvest	1,446	unknown	
Non-commercial Stand Improvement	279	$145-$190	$40,455-$53,010
Precommercial Thin	1,117	$330-$560	$358,610-$625,520
Aspen Restoration	126	$120	$15,120
Meadow Restoration	409	$145-$190	$59,305-$77,710
Planting	43	unknown	
Rearrangement of Fuels	258	$845	$218,010
Five-Needle Pine Release	243	$120-$190	$29,160-$46,170
Landscape Broadcast Burns that do not overlap other vegetation treatment units	3,453	$90-$200	$310,770-$690,600
TOTAL	***11,069***		
Additional proposed acres of Landscape Broadcast Burning that overlap other vegetation treatment units.	1,827	$90-$200	$164,430-$365,400
TOTAL	**11,069**		**$1,195,000-$1,858,000**

OUTCOMES

Successful implementation of this TIP will be determined by the improvement of grazingland health, improve livestock distribution and control over grazing utilization, and wildlife habitat on enrolled acres.

Pastureland: Evaluate the enrolled pastureland before and during implemenation using the Pasture Condition Score (PCS). Goal of a PCS of 45 or higher on the offered acres through improved grazing management and facilitating practices. A PCS score of 45 or higher requires a high level of species diversity and forage production.

Rangeland: Conduct a rangeland inventory prior to implementation to record plant community state/phase, establish benchmark Rangeland Health Assessment and Rangeland Trend. During implementation establish site-specific long-term goals and monitoring methods for each grazing unit. Line-point intercept and photos will be used monitoring tools. Goal: create a positive rangeland trend on offered acres. Improve percent cover of vegetation and litter on point line intercept. Most importantly continue a trend of increased basal cover (the percent of ground covered by the base of a perennial plant).

Riparian: Prior to planning, conduct inventories, photo document benchmark conditions, and where applicable, complete Riparian Assessments using the MT-2 Form. During implementation establish site-specific long-term goals and set up photo monitoring on enrolled riparian areas. Goal: create a positive riparian trend on offered acres and, where applicable, achieve "sustainable" rating on the MT-2 Riparian Assessment long-term. Improve percent cover of vegetation on point line intercept.

All Land Uses: Pre- and post-treatment utilization mapping in hopes of showing significantly improved grazing utilization within each grazing unit.

Education: Provide education events to interested and enrolled participants. Evaluate the success of the education events through participant feedback.

It is estimated that forage production can be increased by 75#/ac. For one 6,000-acre ranch that would increase the forage by 450,000 # or 225 tons. If 42,000 ac were treated that would be 3,150,000 # more forage available or 1575 tons per year. A ton of grass hay goes for $200/ton. For one 6,000 ac ranch, a 225-ton increase would equate to $45,000 in additional feed.

USDA- NRCS has developed the COMET tool to evaluate carbon and greenhouse gas for NRCS's conservation practices. The comet tool estimates that if 42,000 ac of prescribed grazing is completed 1662 tonnes of CO2 will be sequestered each year. This is equivalent to 163,261 gallons gas being saved. Prescribed grazing (528), Upland Wildlife Habitat (645), and Silvopasture (381) are climate smart agriculture practices according to Climate Smart Agriculture Activities List. This list was developed by the USDA to emphasize practices that that reduce greenhouse gas emissions or sequester carbon.

PRIORITY AND RANKING

Select one of the following:			
1a	Does the application include Prescribed Grazing on all enrolled grazingland acres?	Yes	
1b	Does the application include Prescribed Grazing on any portion of the enrolled grazingland acres?	Yes	
1c	Does this application not have prescribe grazing planned.	Yes	
Select all that apply:			
Does the application include……			
2a	…practices that would address conifer encroachment on rangeland	Yes	
2b	…Will practices in the application address pastureland that has a PCS of 30 or less?	Yes	
2c	…will practices in the application address native rangeland that has a negative trend?	Yes	
2d	None of the above	Yes	
3	Does the application include practices specifically planned to improve riparian function?	Yes	
3a		No	

4	Does the application include off-stream water developments	Yes	
4a		No	

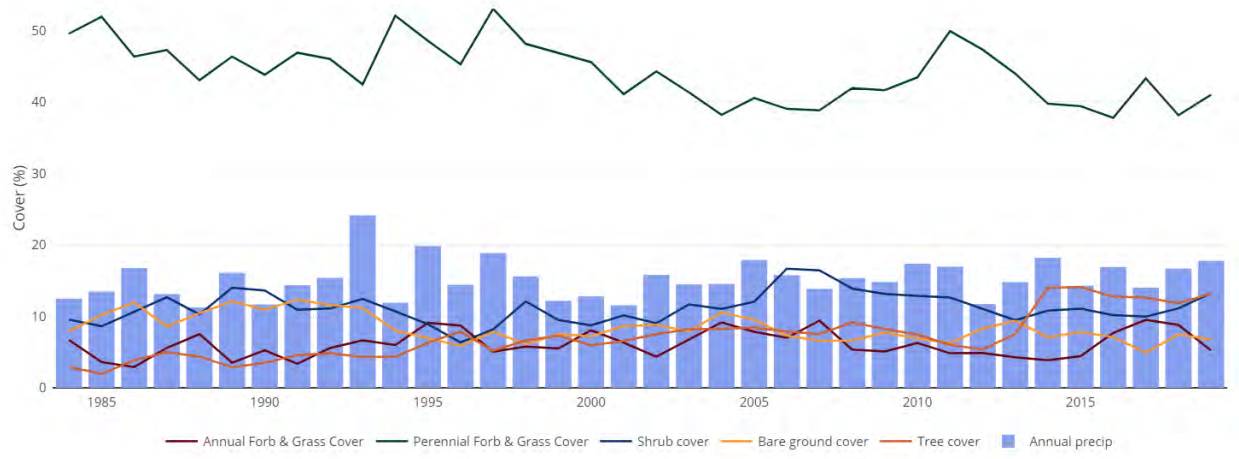
REFERENCES

Leiberg, 1904. 1904 report on historic forest conditions within the Little Belt Mountains Forest Reserve. Bureau of Forestry.

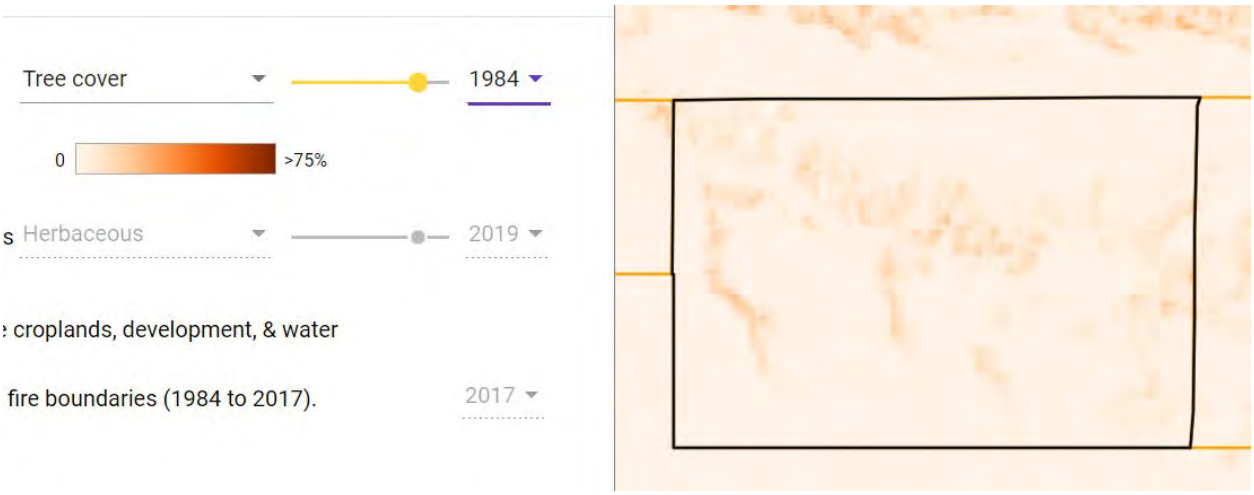
Horsefly project preliminary Environmental Assessment. US Forest Service. Helena-Lewis and Clark National forest https://www.fs.usda.gov/nfs/11558/www/nepa/108840_FSPLT3_5299442.pdf Accessed January 2021.

APPENDIX

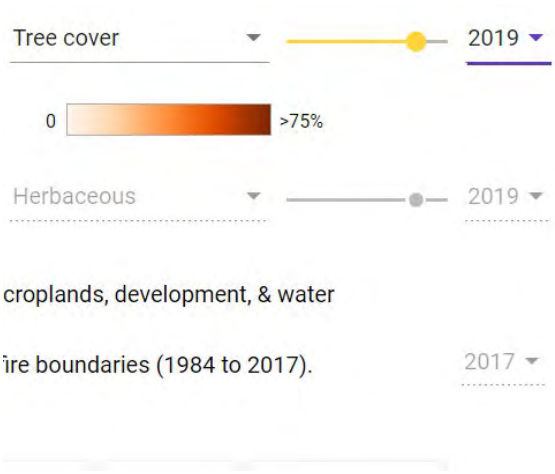
Appendix Figure 1. *From Rangeland Analysis Platform for location within Smith River Grazingland Health TIP. This pasture is 5000'-5500', it is a dry site that historically would only have trees in draws that receive extra moisture. Tree cover is on the rise from 1984 to 2019.*



Appendix Figure 2. *From Rangeland Analysis Platform for location within Smith River Grazingland Health TIP. This pasture is 5000'-5500', it is a dry site that historically would only have trees in draws that receive extra moisture. Tree cover in 1984.*



Appendix Figure 3. *From Rangeland Analysis Platform for location within Smith River Grazingland Health TIP. This pasture is 5000'-5500', it is a dry site that historically would only have trees in draws that receive extra moisture. Tree cover in 2019.*


Tree cover
2019
0
>75%
Herbaceous
2019
croplands, development, & water
ire boundaries (1984 to 2017).
2017