Little Belt Mountains Ecosystem Restoration TIP

Great Falls Field Office - Megan Reinarz, Soil Conservationist

Location: Little Belt Mountains (southeast Cascade County)

Primary Goal: Improve and maintain ecosystem functions in the Little Belt Mountains project area by addressing, plant structure and composition, wildfire hazard from biomass accumulation and plant productivity and health.

TIP Summary: In August of 2021, four producers contacted NRCS to share their concerns of conifer encroachment on their properties in the Little Belt Mountains area of Cascade County. Conifer encroachment has occurred on approximately 25% of all rangelands in the United States (Morford., et al, University of Montana - 2022). Since 1986, over 41,000 acres of rangeland within the Targeted Implementation Plan (TIP) boundary have been invaded by conifers (Rangeland Analysis Platform). Conifer encroachment reduces the herbaceous vegetation's potential production, increases the occurrence of disease and pest pressure, and impacts rangeland health. The reduction in conifers will reduce plant pest pressure, improve forest structure and composition, mitigate wildfire hazard, and increase plant productivity.

Resource Concerns: Plant Structure and Composition, Wildfire Hazard from Biomass Accumulation, Plant Productivity and Health

Resource Concerns: See page 38 in the Cascade County Long Range Plan

Budget & Timeline: Approximately $5,094,046 will be needed from NRCS to fund an estimated total of 12 EQIP contracts, each lasting 3 to 5 years. Sign-ups will occur in FY2024, FY2025 and FY2026.

Geographic Focus

The 412,659-acre TIP project area was chosen because of strong area landowner interest coupled with the shared goals and objectives of the Coyote-Divide Vegetation Project that the U.S. Forest Service is currently implementing in the area. The project objectives are to analyze vegetation departure, insect hazard, wildfire threat and to provide management opportunity recommendations focused on vegetation restoration and reducing wildfire threat.

Figure 1: TIP Boundary Map

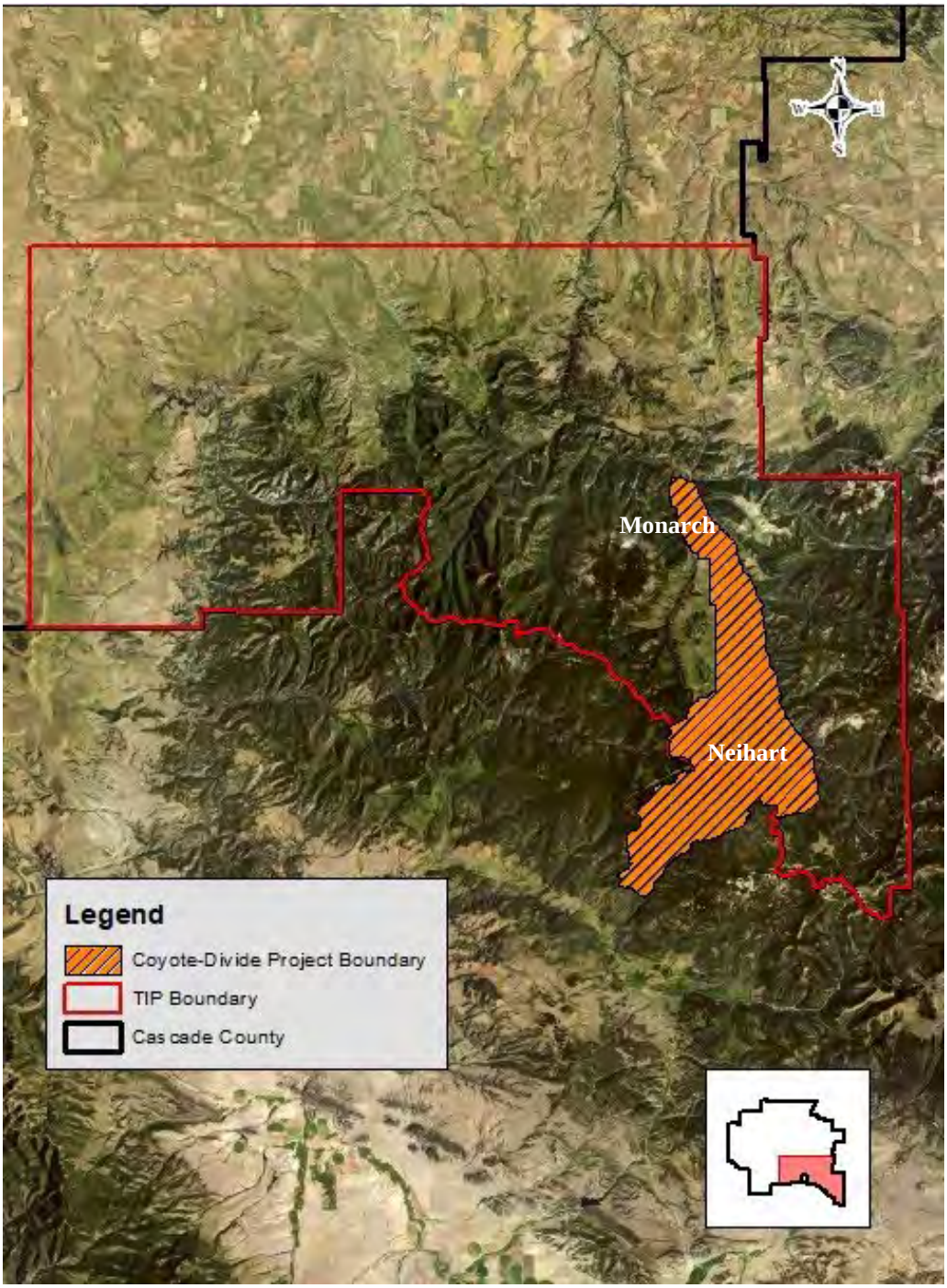
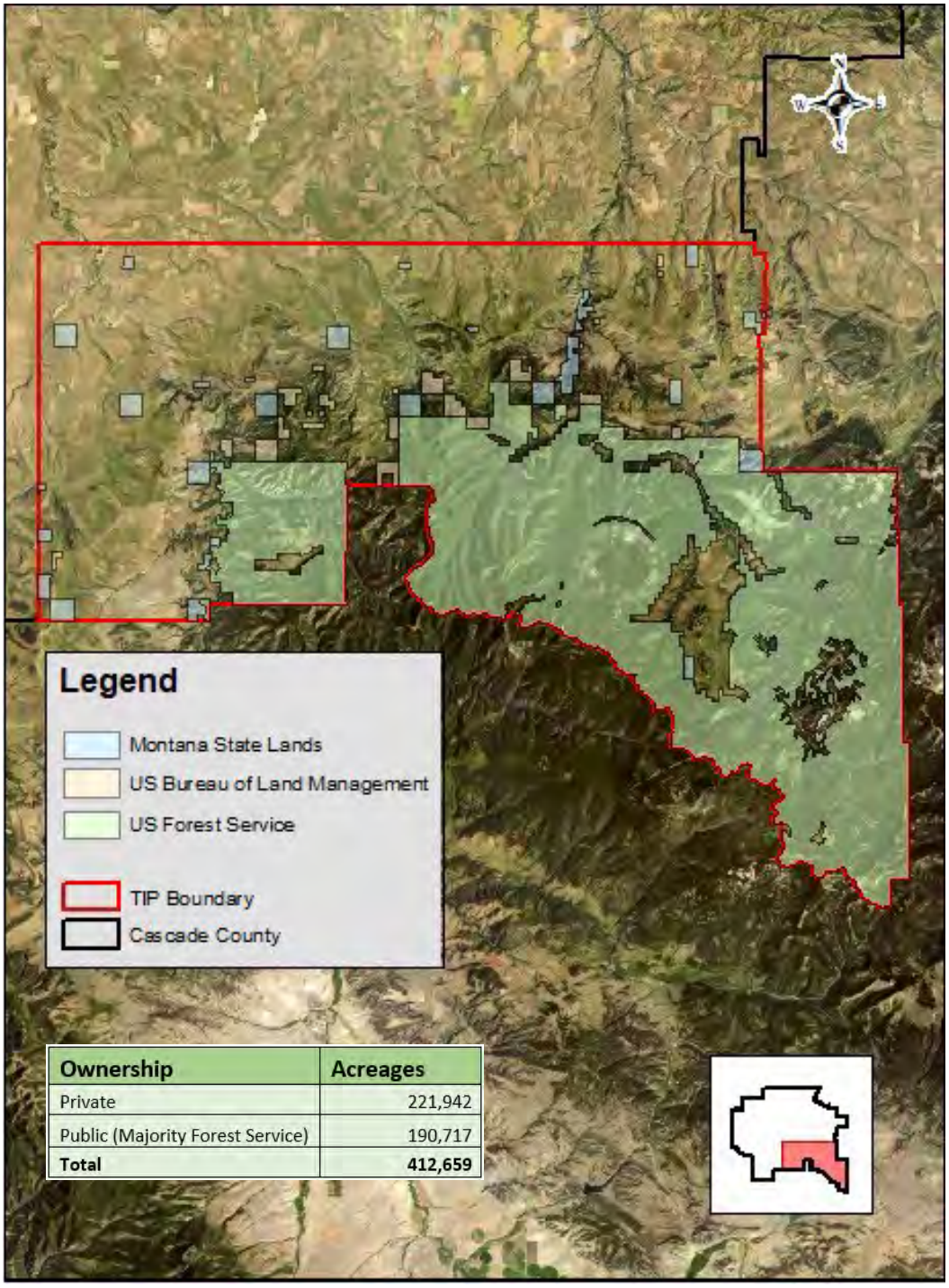


Figure 2: Public Land within TIP Boundary



The Forest Service manages most of the public acreage within the TIP boundary. Many private landowners are interspersed between the Forest Service managed areas.

Resource Concerns

The top resource concerns that will be addressed in this TIP are **Plant Structure and Composition**, **Wildfire Hazard from Biomass Accumulation**, and **Plant Productivity and Health**. These resource concerns will be managed by implementing Forestry Thinning and Fire Mitigation which are listed as top priorities in the Cascade County Long Range Plan (NRCS 2019, pg. 38).

Conifer encroachment increases forest stand density, decreases available forage, reduces available habitat, displaces wildlife, reduces productivity, replaces native grass and forbs, and increases the risk of wildfire. Over the past 36 years, approximately 41,000 acres of productive rangeland have been lost to the encroachment of conifers in the TIP project area alone (Rangeland Analysis Platform). Forest thinning inhibits pest spread and reproduction by increasing stand vigor. Heavy fuel load accumulation on public and private lands have enabled fires to burn at an uncontrollable scale. The overstocked nature of the encroaching trees can lead to fires burning substantially hotter and longer than historically observed. This has the potential to damage the soils and seed source present on the site. Areas can take decades to return to a healthy state. Proactive management helps to improve forest health while reducing biomass accumulation. These actions serve to accomplish the community's goals as outlined in the Cascade County Long Range Plan (see pg. 38).

Goals and Objectives:

The primary goal of this TIP is to improve and maintain ecosystem functions in the Little Belt Mountains project area by addressing, plant structure and composition, wildfire hazard from biomass accumulation and plant productivity and health.

The desired future condition of our treatment units within the Little Belt Mountains are as follows:

- Overall reduction in fuel loading and catastrophic wildfire risk
- Stands with lowered stocking rates to improve health and vigor of individual trees
- Increased amount of understory native herbaceous vegetation through the reduction of conifer encroachment
- Reduction in ladder fuels that cause potential for crown fires
- Forest land treated to reduce wildfire risk and improve forest health
- Rangeland treated to improve forage and habitat for livestock and wildlife
- Implement NRCS practices, including Brush Management, Herbaceous Weed Treatment, Fuel Break, Woody Residue Treatment, and Forest Stand Improvement
- Increased outreach to the public through targeted mailings and education events
- Increased distribution of forest management technical assistance and education to landowners
- Documentation of before and after photographs of various practice implementation

To achieve desired conditions tree densities should be reduced while maintaining species diversity. The reduction of conifers will also greatly reduce the potential for catastrophic wildfire, potentially saving human and animal life.

Proposed Alternatives

No Action Alternative: The no action alternative would lead to an increase in the stocking rates of trees, further encroachment of conifers into rangeland, increased risk for catastrophic wildfires, continued degradation in the quality of soil and water, and lowered plant diversity within the project area. Forest health will continue to decline in the short and long term due to overstocking, insects, diseases, and undesirable stand composition. Fuels will continue to accumulate, compounding the resource concerns. This alternative does not support the goals of the Cascade County Local Working Group (NRCS 2019).

Selected Alternative: Under this alternative NRCS will work with producers to reduce the amount of conifer encroachment and in the process, reduce the amount of fuels, thereby reducing wildfire risk. The project would unite individual efforts and address forest health concerns. A suite of practices would be implemented to address inadequate structure and composition, wildfire hazard from biomass accumulation and undesirable health and productivity concerns. This alternative was selected due to the likelihood that producers will want to adopt the following practices: Brush Management (314), Woody Residue Treatment (384), Prescribed Grazing (528), and Forest Stand Improvement (666). Brush Management (314) will be implemented by mechanical control methods to cut or shear the trees. Woody Residue Treatment (384) is intended to treat the woody materials present due to pest activity in addition to any residual woody materials created during project implementation. Treatment of woody materials will reduce hazardous fuels, reduce forest pest-habitat and forage, and improve access to forage for livestock. Prescribed Grazing (528) (deferment) will be used when brush management is occurring in areas with greater than 15 percent canopy cover. The deferment will last for one year. Forest Stand Improvement (666) will be used to manipulate species composition, stand structure, and stocking densities by cutting and removing trees. These techniques will reduce wildfire risk and improve stand vigor and defense against forest pests.

Fuels reduction using mechanical treatment is the most feasible and flexible treatment to be considered. Heavy machinery such as an excavator fitted with a masticator head can treat large areas of conifer encroachment regardless of weather conditions, though slope can be a limiting factor with this option. Hand crews working on steep slopes can be an economical choice. Excessive woody residue can be produced and must be treated either with piling and burning, chipping, or mastication. This is the best option when taking into consideration landowner objectives, ease of implementation, and financial feasibility. The speed of which treatment is applied is vital to the success of the TIP. As time elapses more rangelands will be invaded by conifers and conifer stocking rates will continue to increase to levels which cannot be reclaimed without management of the resources. This alternative will accomplish the goal of improving and maintaining ecosystem functions in the Little Belt Mountains project area by addressing, plant structure and composition, wildfire hazard from biomass accumulation and plant productivity and health.

RMS Level Alternative: Under this alternative NRCS will work with producers to develop grazing plans that implement a grazing rotation that improves the health, productivity, and resilience of grazing-lands and grazeable forest. At a minimum, Forest Stand Improvement (666), Prescribed Grazing (528), Upland Wildlife Habitat Management (645), and Pest Management (595) would be required to meet RMS criteria. Forest Trails & Landings (655) would need to be implemented only when roads are created, and the disturbed areas would need to be seeded. RMS infrastructure practices that could potentially be implemented would include Fence (382), Spring Development (574), Streambank and Shoreline Protection (580), Watering Facility (614) and Water Well (642). This alternative would unite individual efforts and address forest and rangeland health concerns at a landscape scale.

Implementation

This TIP will be aimed at addressing the priority resource concerns in an estimated 12 EQIP contracts. These contracts will last three to five years. The Montana Department of Natural Resources and Conservation (DNRC) will write Forest Management Plans for each producer when possible. If the DNRC is not able to write the plans, the use of Technical Service Providers will be utilized. The treatment amounts will be determined by using the suggested stocking rate density that will be outlined in the Forest Management Plans. The projects and practices will be prioritized by use of the ranking questions. Most of the workload demands will be handled by the Great Falls Field Office. Assistance from the State Office will be required in obtaining Job Approval Authority for the Great Falls Field Office staff. The DNRC will create Forest Management Plans for each producer when possible. A workshop will be planned in the

Monarch/Neihart area. The workshop will provide a general overview on how to apply and participate in the EQIP program, program funding available through this TIP project, and education on fire suppression methods. With the assistance of the Cascade Conservation District, targeted mailings will be sent to producers with land inside the TIP boundary to gauge interest.

Proposed Budget

This TIP is estimated to require $5,094,046 in EQIP funds for an estimated 12 EQIP contacts over three signup years (2024, 2025, 2026), and 3 to 5 contract years total. Cost based on FY23 EQIP Payment Schedule.

Table 1: Estimated Total Cost

Fiscal Year	Estimated Assistance
2024	$1,698,016.00
2025	$1,698,016.00
2026	$1,698,016.00
TOTAL	**$5,094,046.00**

Table 2: Detailed Example Contract: Based on a Producer with 500 acres to be treated

******Cost based on FY23 EQIP Payment Schedule with a potential increase in annual payment schedule**

Fiscal Year	Code	Practice Name	Practice Scenario	Units	Amount	EQIP 2023 $/Unit	Estimated Assistance
2024	106	FMP Development	(HU FMP 251 to 500 acres)	#	1	$5,140.80	$5,140.80
	314	Brush Management	(HU Mechanical, Large Woody Veg. Med Density)	Ac	20	$238.86	$4,777.20
	384	Woody Residue Treatment	(HU Pile and Burn)	Ac	15	$455.33	$6,829.95
	528	Prescribed Grazing	(HU Range Deferment)	Ac	20	$7.00	$140.00
	666	Forest Stand Improvement	(HU Pre-Commercial Thinning High Intensity)	Ac	80	$696.92	$55,753.60
							FY24 Total = $79,905.71
2025	314	Brush Management	(HU Mechanical, Large Woody Veg. Med Density)	Ac	20	$238.86	$4,777.20
	384	Woody Residue Treatment	(HU Pile and Burn)	Ac	15	$455.33	$6,829.95
	528	Prescribed Grazing	(HU Range Deferment)	Ac	20	$7.00	$140.00
	666	Forest Stand Improvement	(HU Pre-Commercial Thinning High Intensity)	Ac	80	$696.92	$55,753.60
							FY25 Total = $79,905.71
2026	314	Brush Management	(HU Mechanical, Large Woody Veg. Med Density)	Ac	20	$238.86	$4,777.20
	384	Woody Residue Treatment	(HU Pile and Burn)	Ac	15	$455.33	$6,829.95
	528	Prescribed Grazing	(HU Range Deferment)	Ac	20	$7.00	$140.00
	666	Forest Stand Improvement	(HU Pre-Commercial Thinning High Intensity)	Ac	80	$696.92	$55,753.60
							FY26 Total = $81,675.91
2027	314	Brush Management	(HU Mechanical, Large Woody Veg. Med Density)	Ac	20	$238.86	$4,777.20
	384	Woody Residue Treatment	(HU Pile and Burn)	Ac	15	$455.33	$6,829.95
	528	Prescribed Grazing	(HU Range Deferment)	Ac	20	$7.00	$140.00
	666	Forest Stand Improvement	(HU Pre-Commercial Thinning High Intensity)	Ac	80	$696.92	$55,753.60
							FY27 Total = $89,843.50
2028	314	Brush Management	(HU Mechanical, Large Woody Veg. Med Density)	Ac	20	$238.86	$4,777.20
	384	Woody Residue Treatment	(HU Pile and Burn)	Ac	15	$455.33	$6,829.95
	528	Prescribed Grazing	(HU Range Deferment)	Ac	20	$7.00	$140.00
	666	Forest Stand Improvement	(HU Pre-Commercial Thinning High Intensity)	Ac	80	$696.92	$55,753.60
							FY28 Total = $98,827.85

Total Contract Payment = $424,503.80

Historically Underserved (HU) rates were used because it is anticipated that some applicants could be considered beginning farmers in this area and would qualify for a higher payment rate. So as not to underestimate need, HU rates were used

Partnerships

- **Montana Department of Natural Resources and Conservation (DNRC)**—DNRC will provide technical assistance. Their assistance will be utilized in developing Forest Management Plans for each producer when possible. The NRCS field office will be organizing outreach meetings and preparing targeted mailings to find potential interested producers.
- **Forest Service (USFS)----** USFS will support the NRCS field office in organizing outreach meetings. USFS is already working within the TIP area on a similar project. The NRCS field office will help perform joint outreach supporting this targeted plan and the Forest Service's "Coyote-Divide Vegetation Project". This project will be complimentary to the TIP objectives and will likely be expanded by TIP funding. USFS foresters can assist with planning, monitoring, and inventory needs when possible.
- **Prairie Pothole Joint Venture (PPJV)**— PPJV provided technical assistance on this TIP proposal and will provide technical assistance for evaluating outcomes on grassland bird species via their Science Integration Specialist when possible.
- **Montana Fish Wildlife and Parks (FWP)----**FWP provided technical assistance on this TIP proposal and will provide technical assistance for evaluating outcomes on wildlife habitat via their Wildlife Habitat Specialist when possible.
- **Cascade Conservation District (CCD)**---CCD can provide interested producers with educational support. The CCD will be aiding in organizing outreach meetings, preparing targeted mailings, and will assist with some workshop funding needs when possible.

Outcomes:

- **Improve Wildlife Habitat**: Reducing the number of conifers that are encroaching into grazing land may increase priority grassland bird populations in the TIP area. Many of these priority grassland bird species are in steep decline so even maintaining their populations is a strong conservation benefit, much less increasing them. The use of the Wildlife Habitat Evaluation Guide (WHEG) for range and forest land uses will show the improvement in habitat condition for grassland bird species. The WHEGs utilize a numerical rating to compare the value of existing wildlife habitat with the value of wildlife habitat under various alternatives.
- **Improve or Maintain Perennial Cover**: Rangelands are among the most imperiled ecosystems in the world and grassland loss continues at alarming rates. Comparing photographs of the same area taken over a period of years documents changes in the soil and plant community. Vegetative data can be collected and used to detect subtle changes that occur over the long-term. Attributes that could be measured might include plant composition, canopy cover, density of noxious weeds, and ground cover (i.e., bare ground, litter, living plants).
- **Improved Forest Structure and Composition**: This TIP will result in improved pest resiliency, plant health, and wildfire resistance. Measured as the number of acres reduced to the suggested stocking densities outlined in the Forest Stand Improvement Practice Specification.
- **Increased Fire Resiliency of the Monarch and Neihart Communities**. Measured as the number of properties that have implemented tree thinning practices and/or fuel breaks on their land.
- **Increase in Public Awareness and Knowledge of the Identified Resource Concerns**. Measured as the number of engagements with individuals through technical assistance and outreach events.

Progress will be measured by completing annual contract status reviews. Both the NRCS field staff and the landowners will work to monitor plant condition through annual monitoring (such as photo-point monitoring), use of rangeland inventories, and the use of the WHEG. Measurable outcomes that will be monitored through the duration of this TIP will include monumented transects monitoring of plant

communities pre and post treatment. A successfully implemented project will be safer in the event of a wildfire, create a properly functioning ecosystem, and increase the availability of water and nutrients available to desirable flora and fauna.

Investment of public funds into this project will yield a variety of benefits to the average taxpayer both locally and nationally. The project addresses climate change by implementing practices that may result in lower greenhouse gas emissions into the atmosphere. When a forest undergoes a high intensity wildfire, some of the organic material stored above ground and in soils is volatized and released as fuels burn. If wildfire intensity can be reduced through forest management such as the thinning proposed in this plan, the result may be more organic matter remaining in the forest after a fire. Allocation of funding to this project is expected to generate an increase in forest management work in the area. This contributes to the local, state, and national economies by generating cash flow and the expected tax revenues associated. Taking preventative action to limit the potential for emergency situations can save lives, a value that cannot be quantified, but should be upheld as the ultimate benefit to the public.

Ranking Questions

1. Will high priority practices be included in this project? ----(314, 384, 666)
    a. The project includes 3 priority practices
    b. The project includes 2 priority practices
    c. The project includes 1 priority practice

2. Project will address which forest health issues: Spruce Budworm, Mountain Pine Beetle, Fuel Quantity, Aspen Improvement, Forage Quantity?
    d. The project addresses 4-5 of the forest health issues
    e. The project addresses 2-3 of the forest health issues

3. Are the planned practices adjacent to an existing defined treatment area and will benefit or augment the resource issues in the defined treatment area (Ex: Forest Service treatment area as defined by the Coyote-Divide Vegetation Project Map)
    f. Directly adjacent
    g. Less than 1 mile
    h. Greater than a mile

4. How far is the proposed project from a public road?
    i. Adjacent
    j. Not adjacent but less than 1/5-mile
    k. 1/5-mile or greater

5. Will planned practices improve forage production for wildlife and livestock on grazing lands?
    l. Yes
    m. No

6. Does the application have a home site on the property, and will the defensibility of that site be improved by the treatment?
    n. Directly adjacent
    o. Less than 1/5-mile

Literature Cited

Morford, S.L, Allred, B.W, Twidwell, D, Jones, M.O, Maestas, J.D, Roberts, C.P, Naugle, D.E. (2022). Herbaceous production lost to tree encroachment in United States rangelands. *Journal of Applied Ecology*. https://doi.org/10.1111/1365-2664.14288

[USFS] United States Forest Service. (2014). Lewis & Clark National Forest - Summary Report: Little Belt Mountain Landscape Assessment Available at: https://www.fs.usda.gov/project/?project=5980