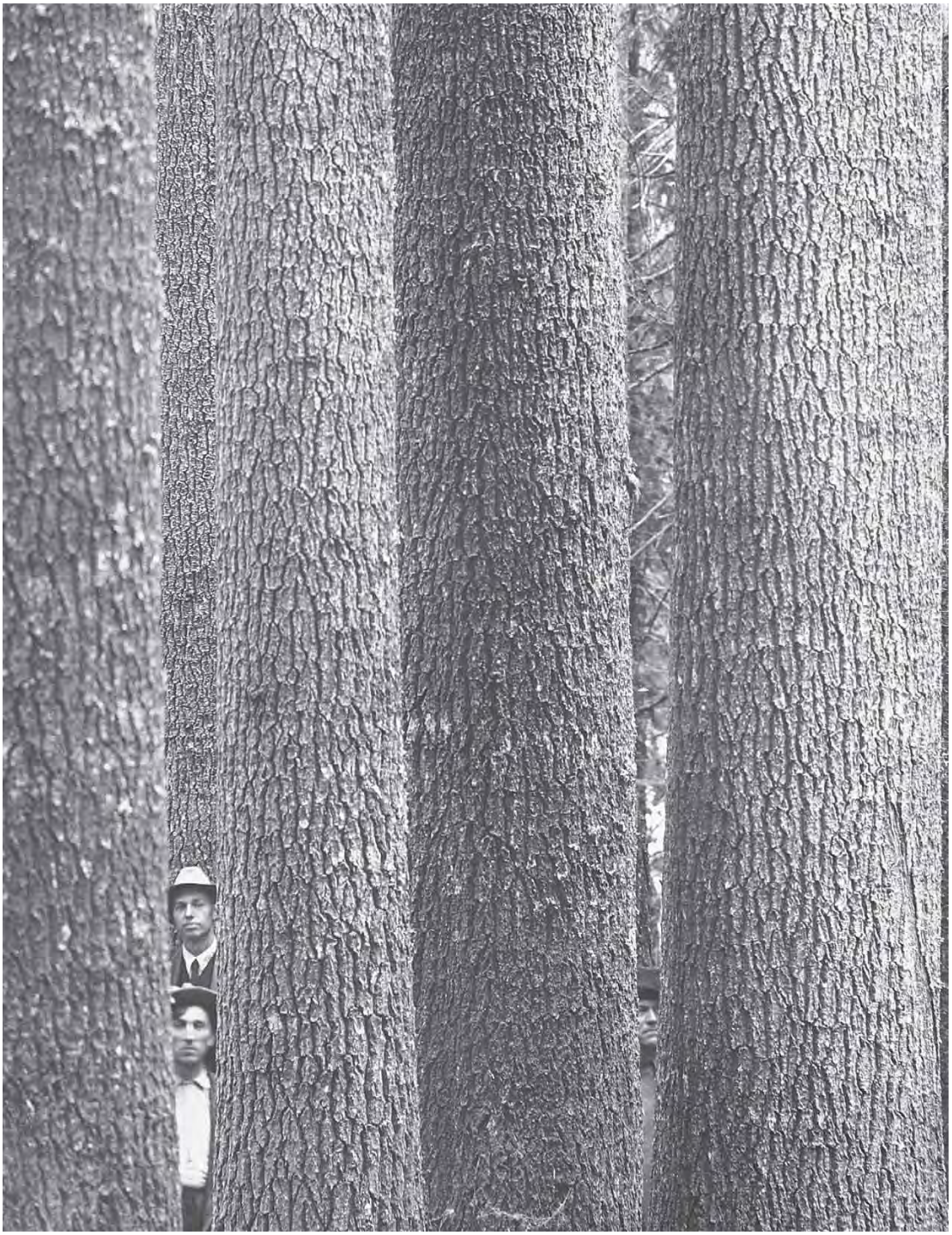
Addressing a Species in Decline: White Pine, King of the Forest

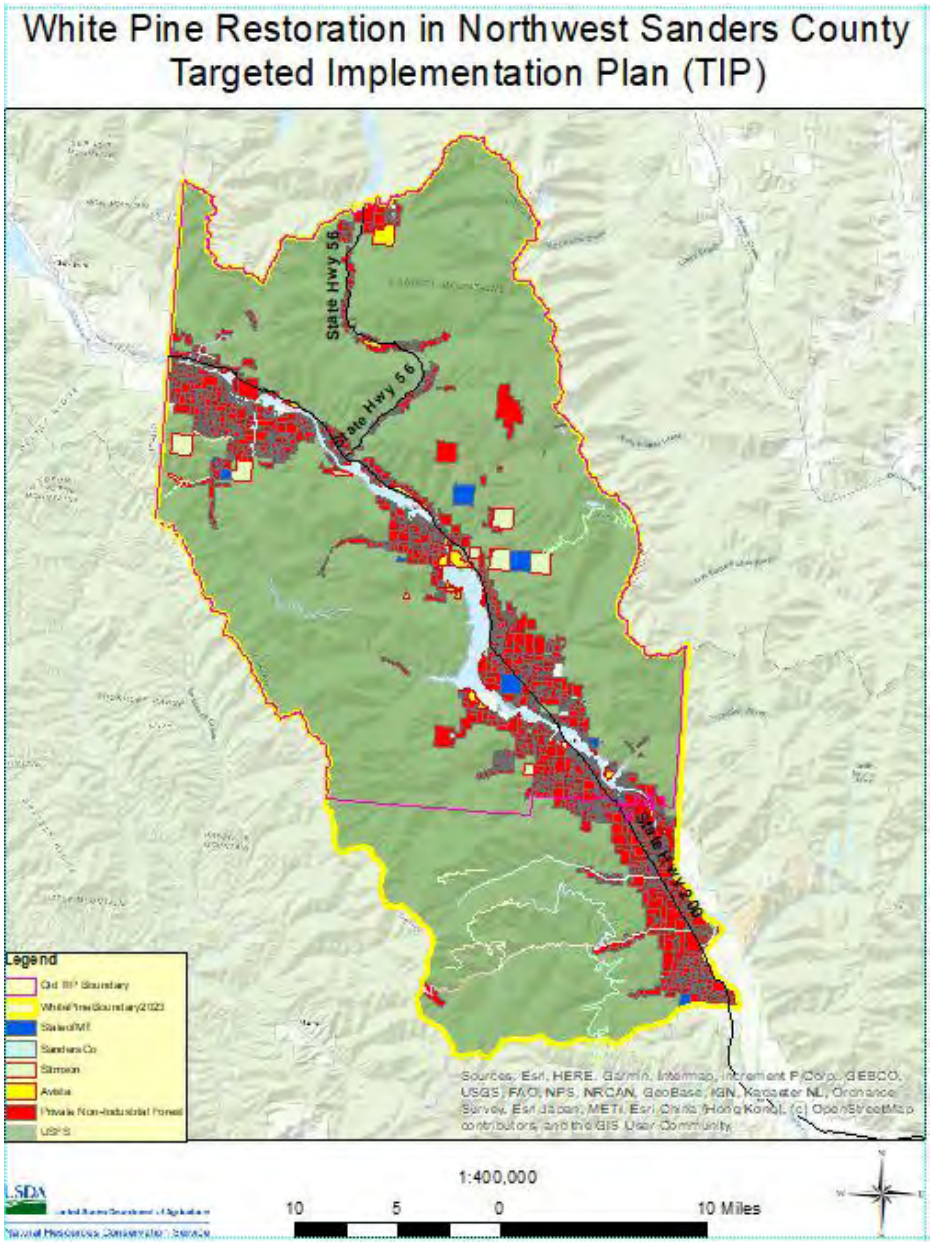
'White Pine Restoration in Northwest Sanders County'



Summary of 2023 Proposed Changes to TIP

The primary proposed change to this TIP, to begin in FY 2024, is a TIP boundary adjustment. The new boundary would encompass an additional 108,413 acres, of which 30,269 acres are privately owned. The boundary being adjusted is the southern boundary, which would be extended towards Thompson Falls, MT to include additional white pine growing sites in the white pine creek, Big Beaver Creek, and Little Beaver Creek Watersheds. This work is still a priority of the Local Working Group, which last convened in October of 2022. These priorities are still reflected in the Sanders County Long Range Plan. The updated TIP will maintain the original resource concerns, practices, and ranking questions.

Initially, the final year of the TIP was set for FY2024. As such, the secondary proposed change to the TIP includes extending the duration of the expanded TIP for an additional 3 years, to expire in FY2027.



Overview/Background Information

Towering over 150 feet tall with a lifespan of up to 500 years, the white pine, or 'king pine' as they are commonly known, are a species in peril. Once a primary component of our forests in the Interior Northwest of northern Idaho and Montana, the majestic white pine is now found on less than 10 percent of the original 5 million acres that it once dominated. Prized for its size, growth rate, lumber quality, and resiliency to root disease and pests, white pine has experienced a precipitous decline. A combination of factors including overharvesting, pine beetle damage, lack of fire-mediated opportunities for regeneration and most significantly the invasive fungal pathogen that causes white pine blister rust have led to the collapse of this critical species. The Montana Heritage Program lists white pine as an S3 status meaning white pine is 'potentially at risk due to limited and/or declining numbers, range and/or habitat, even though it may be abundant in some areas.

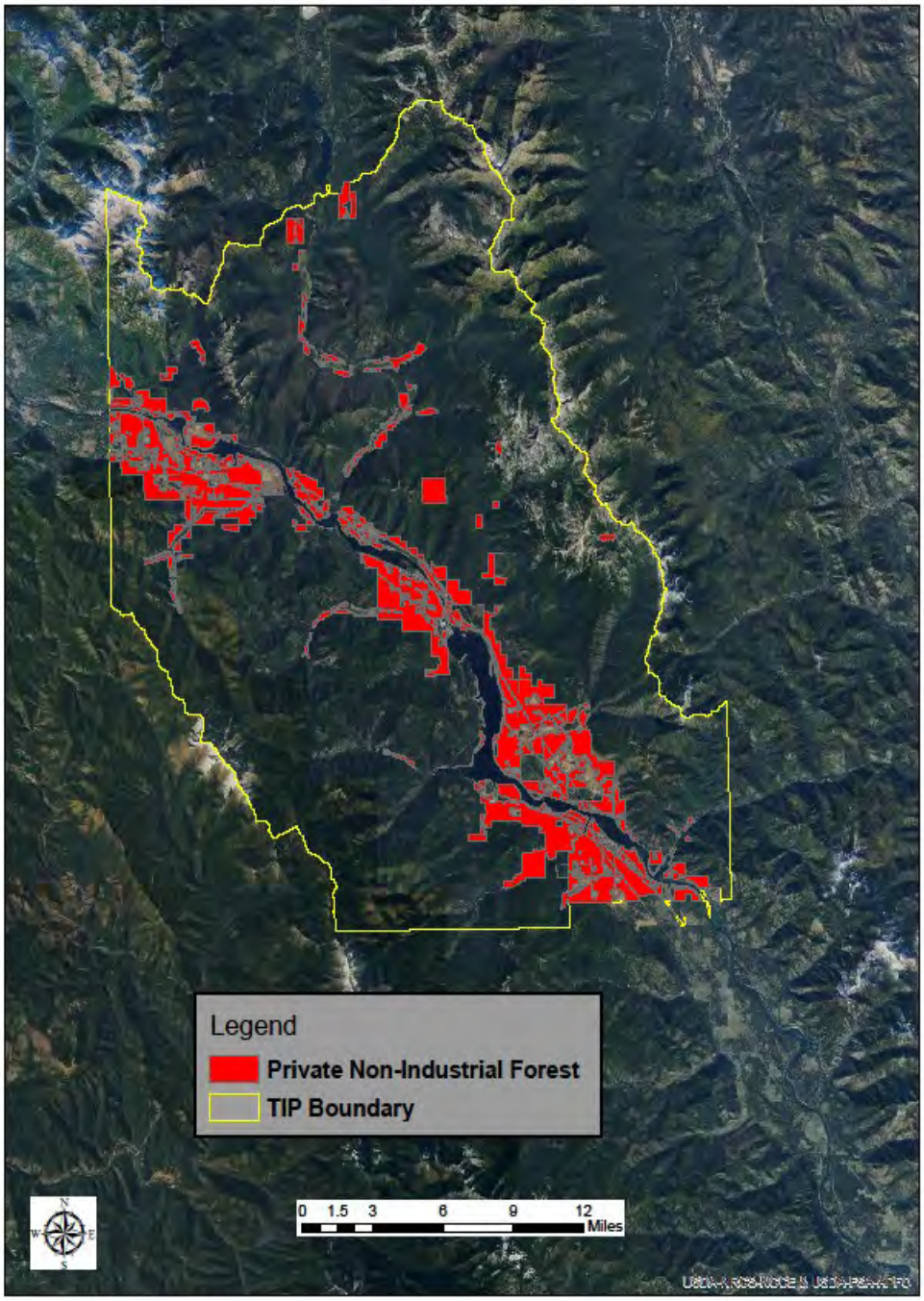


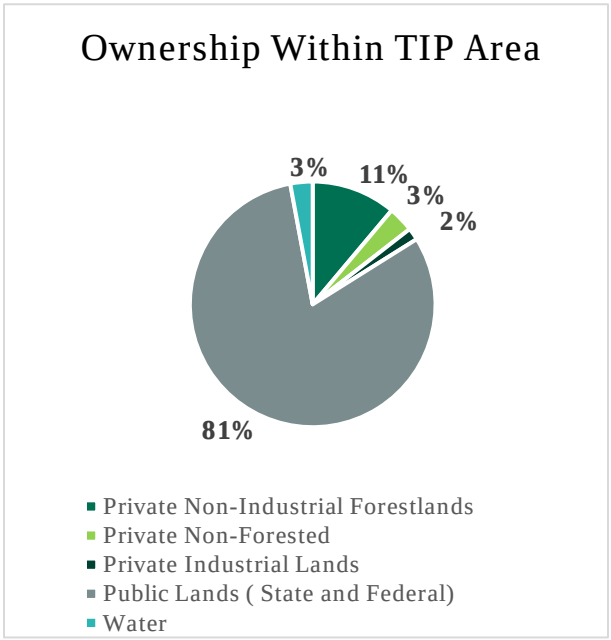
Figure 1: TIP Area with private lands highlighted in red.

This Targeted Implementation Plan (TIP) aims to increase the extent of white pine stands as well as improve the health of existing white pine stands on private lands within the targeted area. The Plains Field Office along with partners including the Sanders County Local Working Group (SCLWG), Montana Department of Natural Resources and Conservation (DNRC), US Forest Service and the Green Mountain Conservation District (GMCD), have identified the northwestern Sanders County area as a priority for this effort. The prioritized area lies within Sanders County and extends from the confluence of the Vermillion River with the Clark Fork River to the Idaho border (figure 1). This area has been identified as a high priority because it encompasses some of the best site-indexes for white pine within Montana (*Forest Habitat Types of Montana*, USDA Forest Service General Technical Report INT-34, appendix E-3).

This TIP proposal encompasses over 360,000 acres, the vast majority of which are publicly owned primarily by the U.S. Forest Service. Private, non-industrial forestland ownership is limited primarily to the valley floors and totals 40,206 acres. An additional 12,164 acres are private non-forested land uses. Furthermore, this area of the county also has the greatest concentration of private land with conservation easements totaling over 3,000 acres (figure 3). Land trusts holding the easements generally support land management improvements but lack the expertise and personnel to work with landowners to implement conservation improvements necessary for promoting white pine. The Lower Clark Fork Watershed Group and Green Mountain Conservation District have been active in riparian restoration projects since the early 2000s, and this proposal has the potential to complement this work on forest lands adjacent to these important riparian areas.

It is recognized that the area within this TIP is large, however, the footprint of private lands within the boundary encompasses only 11% of the overall land ownership. Many private property owners in this area have been historically uninterested in program participation. Opening this TIP to a larger area will ensure we have adequate program participation to meet objectives.

Figure 2 and Table 1: *Ownership within the TIP area*



Ownership	Total Acres	Percentage
Private Non-Industrial Forestlands	40,206	11%
Private Non-Forested	12,164	3%
Private Industrial Lands	5766	2%
Public Lands (State and Federal)	292,638	81%
Water	10,602	3%
TOTAL	361,376	100%

Initial interest from local landowners appears promising. Currently, eight landowners within the project area have expressed interest in participating, before the announcement of a Targeted Implementation Plan. Successful implementation of this TIP is expected to require a minimum of 5-10 contracts per year and treat a minimum of 1,500 acres in 5 years. The Sanders County Local Working Group has voiced strong support for this TIP. The NRCS will use screening tools and ranking to prioritize work within the TIP area throughout the lifespan of the TIP.

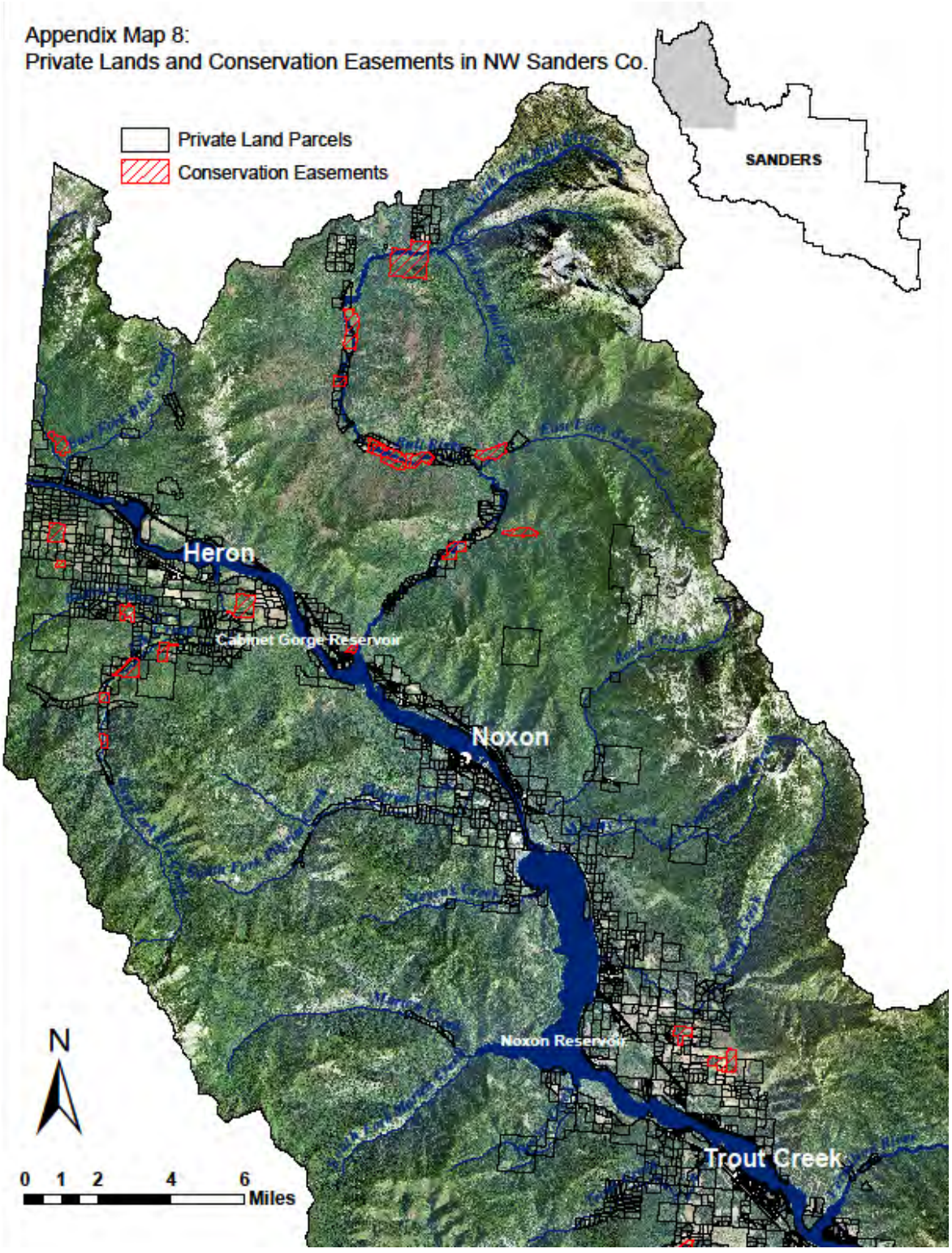


Figure 3: Private land holdings within the TIP area with Conservation Easements highlighted in red

Problem Statement

The white pine population has decreased to 5-10% of its historical range since the start of the 20th century. The drastic decline in this critical species has reduced forest health and productivity potentials, increased the risks of catastrophic fires, reduced habitat potentials on a landscape scale, and caused degradation of riparian habitats and stream channel morphology.

Over the past 110 years, the inland northwest has realized a severe decline in the proportion of white pine in stands and of white pine forest types. Overharvest, pine beetle damage, a lack of fire-mediated opportunities for regeneration and most significantly the invasive fungal pathogen that causes white pine blister rust have led to the collapse of this critical species. White pine blister rust is a fungal pathogen-specific to five-needle pines. Native to China, it was introduced to North America around 1900. Since its introduction, white pine blister rust has devastated western white pines (*Pinus monticola*) as well as many other pine species across the continent. White pine blister rust requires the presence of an intermediate host plant, of the genus *Ribes* (currants and gooseberries,) to complete its lifecycle. Blister rust creates cankers on the branch and truck of infected trees. As the disease progresses the cambium of the tree is destroyed thereby cutting off the flow of nutrients to the tree leading to eventual death.

The drastic decline of white pine across the landscape has changed the species composition of forest stands creating conditions unfavorable to white pine regeneration. In many cases, white pine populations have been reduced so drastically that there remain no trees to produce seed. The loss of white pines has had negative impacts on the diversity of our forestlands which has impacted fire regimes, habitat potentials and stream geomorphology. One consequence of the reduction of white pines has been a significant increase in the incidence and densities of western hemlock, Douglas-fir and true firs in our forests. The increase in firs furthered root disease impacts on our forests. A fungal disease, root disease is a native forest pathogen that lives in the soil. Douglas-fir and the true firs are the most susceptible species to root disease. Fire historically played a major role in subduing these species and promoting root disease-resistant species (such as white pine) within our forests. As fir densities have risen, so too has the prevalence and resultant effects of root disease. Root disease affects yields by killing trees and causing decay. Forest land may be rendered nonproductive when disease centers regenerate with susceptible tree species that are subsequently killed before they reach merchantability (USFS *Management Guide for Root Disease* by Sue Hagle, 2010). Increased fir densities and associated die-off from root disease have significantly increased the risks of catastrophic fire events.

As white pine populations have declined, the number of large-diameter trees and 'old forests' within our forests have greatly declined in the last 100+ years. These losses have been particularly common in riparian areas. Old forests provide a habitat component lacking in younger, smaller diameter forests. Cavity dependent species utilize these forests heavily, while other wildlife use them sporadically but during critical periods; for instance, ungulates utilize old forests during deep snow periods. Additionally, large-diameter wood and tree roots are a key natural component of area streams, providing flood plain stability and stream habitat. Lack of large-diameter trees has exacerbated instability and degradation of many local streams.

As noted previously, the lack of regeneration by white pine due to species loss has exacerbated the decline of the species. The proportion of white pine regeneration (planted and natural) in eastern Washington, northern Idaho, and western Montana decreased from 44% in 1941 to just 5% in 1979 (USFS Silvics guide). Fortunately, a vigorous breeding program was started in 1957 to select for blister rust-resistant trees. Seed from these trees was not available in large quantities until 1985. However, between 1976 and 1996, only 5% of the lands that have the potential to grow white pine were planted with blister rust-resistant trees. Planting on public lands has decreased since 1996 as tree harvesting that can create planting sites has slowed (Return of the Giants, U of ID Station Bulletin 72).

This TIP is needed because relying exclusively on natural processes to restore white pine to its former ecological position will be slow and uncertain at best, especially in areas where only a few remnant white pines remain to provide a seed source. These diminished gene pools are subject to chance occurrences of bark beetles, wildfire, and other disturbances. Where natural regeneration does occur, blister rust mortality in seedlings takes a heavy toll, leaving few white pine seedlings to populate the stands of the next generation. And natural selection cannot work at all where white pine seed sources have already been lost.

The TIP focuses on increasing the proportion of white pine in the stands selected for treatment. The main resource concerns addressed will be plant structure and composition. Currently, white pine is drastically underrepresented in the forested stands within the TIP area resulting in a lack of adequate diversity, structure or composition to support the desired ecological functions and management objectives. Additional resource concerns that will be addressed through practices that will increase the proportion of white pine in stands include plant productivity, health and vigor, plant pest pressure.

Goals and Objectives

Project objectives are as follows:

1) Improve site conditions for white pine and aid in the establishment of white pine on participating properties by using the identified suite of practices.
   a) Work with DNRC to develop Forest Management Plans (FMP) with silvicultural prescriptions for each participant with consideration for long-term forest health and resiliency. Private forestry consultants may also be used to develop FMPs on a case-by-case basis.
   b) Complete at least 1,500 acres of treatment over 5 years leveraging the assistance of multiple partners.

2) Work with partners to increase landowner education and awareness of the value of white pine and its management as well as general forest health and ecological management opportunities to provide long-term management benefits.
   a) Partner with the DNRC to provide outreach to potential clients and develop FMP's.
   b) Work with Sanders County Office of Emergency Management (OEM) who oversees the Sanders County Fire Hazard Reduction Program to identify interested landowners and work with the Office of Emergency Management to maximize conservation benefits for private landowners.
   c) Partner with conservation easement holders to develop FMP's promoting white pine forest stewardship and develop conservation strategies on properties where they hold easements.
   d) Partner with the Lower Clark Fork Watershed Group (LCFWG) to provide landowner awareness of NRCS assistance, refer potential clients, and to use NRCS forestry assistance to complement LCFWG watershed health projects. LCFWG's Coordinator will also provide on-the-ground assistance by working with NRCS to complete conservation planning and outreach.
   e) Partner with the US Forest Service Kootenai National Forest, Cabinet Ranger District to coordinate efforts on private and public lands.
   f) Work with GMCD to outreach to potential clients and promote education.

Alternatives

1. Alternative 1: (No action) White pine populations and quality will remain relatively unchanged in the short and long term. There may be long term declines in white pine populations due to blister rust and other factors.

Associated ecological components of forestland (wildlife, watershed health, fisheries) may not be able to attain the site potential.

2. Alternative 2: (Preferred) Implement a suite of forestry practices to address the decline in white pine and the associated forest health concerns. Implementing this alternative will lead to improvements in white pine populations and quality as well as overall improvements in forest health and productivity and will likely lead to benefits for both landowners and ecological components. Landowners will gain knowledge of the site potential of their forest, its role in the landscape, and have a management direction to sustain benefits into the future. Short-term and long-term benefits of forestry improvements will reduce the risk of catastrophic fire, improve forest health and productivity and improve wildlife habitats.

Alternatives will be analyzed in compliance with the National Environmental Policy Act (NEPA). All practices chosen for implementation will meet NEPA requirements. Special consideration will be given for practices affecting T/E species, such as Canada Lynx and Bull Trout, to meet all federal regulations and NRCS policy requirements. Any cultural resources present will be identified and avoided during the planning and implementation of practices involving any federal action.

Proposed Solutions and Actions

To make improvements to these substantial and complex resource challenges we propose employing a comprehensive approach that engages private landowners, leverages partnerships, and utilizes a suite of available practices to achieve desirable results. We believe that this approach gives us the best chance of achieving a measurable outcome. We will utilize program participants and new applicants who have expressed interest in additional opportunities to help spread the word to other community members. Specific actions will depend on the silvicultural treatment recommended by technical experts which will be outlined in a site-specific Forest Management Plan.

Selected practices may include:
Forest Stand Improvement (666) will be the main practice used to implement the silvicultural prescription. The technique used will vary by project but will focus on forestry thinning practices that promote white pine production.

Woody Residue Treatment (384) will be used if slash generated from the project has the potential to cause a resource concern. Otherwise, the slash will be left to return nutrients to the site and improve the soil

Tree/Shrub Establishment (612) will be used only where natural regeneration is not viable, seed trees are insufficient to meet objectives, or to establish blister rust-resistant white pine on site.

Tree/Shrub Pruning (660) will be used to prune white pine trees to reduce the chance of blister rust infection.

Forest Trails & Landing (655) will be used to rehabilitate trails causing a resource concern or to mitigate concerns by installing water drainage features and vegetation.

Tree/Shrub Site Prep (490) will be used where needed to prepare a site for natural regeneration or planting in areas where Forest Stand Improvement was not utilized.

Forest Management Plan (106) will be used to provide long-term consistency where a forest management plan by NRCS or a DNRC Service Forester is not available or adequate to attain the site potential and landowner objectives.

Partnerships

The Northwest Sanders County Forest Restoration Project consists of the following partners:

- Montana Department of Natural Resources & Conservation (DNRC)
- Sanders County Emergency Management (SCEM)
- Lower Clark Fork Watershed Group (LCFWG)
- Green Mountain Conservation District (GMCD)
- US Forest Service, Cabinet Ranger District

In November and December 2019, a series of meetings were held between the DNRC, USFS, NRCS, County Commissioners, Sanders County Emergency Management and Green Mountain CD to collaborate and prioritize forest management activities. At these meetings, NRCS garnered strong support for this TIP.

DNRC's Service Forester and NRCS in Sanders County have a long history of working together to meet the forestry needs of Sanders County residents. The Service Forester is an important component in referring clients to the NRCS, writing forest management plans, and mutual technical information exchange.

Sanders County Emergency Management (SCEM) has a fire hazard reduction program on-going for 15+ years. Their program focuses strictly on structure protection and is currently funded from Title 3 grants, of which they will pay 90% of fire hazard reduction for a 200-foot radius around structures. NRCS and Sanders County's fire hazard reduction program will complement each other where applicable to this proposal. NRCS and SCEM have both agreed to share information about each other's programs with clients and potential clients and provide complimentary assistance whenever necessary (i.e. NRCS may assist with large-scale forest improvements while SCEM focuses their resources specifically on the protection of structures).

The Lower Clark Fork Watershed Group (LCFWG) and Green Mountain Conservation District (GMCD) both have a long history working with the NRCS in Sanders County to promote conservation and restoration projects. LCFWG's Coordinator has been an excellent asset for technical information and client referrals/networking with other government agencies and NGOs. The LCFWG and GMCD have agreed to assist with outreach and education for the project. Additionally, LCFWG's coordinator will work directly with NRCS to assist with the planning and implementation of this project with an expectation of providing up to 100 hours per year towards the implementation of this project.

The USFS, Cabinet Ranger District supports this proposal. According to the District Fire Management Officer, this proposal will benefit homeowners and landowners but will also provide for firefighter and public safety in the future. The Cabinet Ranger District is currently working on several projects in the TIP area (see Appendix 1) and there will be significant opportunities for cross-boundary work to be done on public and private lands. The USFS will be doing significant amounts of fuel treatments on the boundary of public-private lands and this will provide the NRCS the opportunity to expand the scope of USFS work onto private lands.

Implementation

This TIP will be implemented over five years. Partners have been consulted and interest from potential program participants is strong. The Plains FO will continue to work with partners to increase participation in the project. By completing preliminary outreach and working with partners, the NRCS has already developed a comprehensive list of potential program participants within the project area.

Sanders County's Fire Hazard Reduction Program is already in place and will focus their work within the project area adjacent to structures for home defensibility whereas NRCS will focus their efforts on forest health outside of the area that applies to the County's program.

The DNRC Service Forester is available to assist with outreach, information sharing with potential clients and with writing forest management plans as needed for landowners.

Plains FO staff will be responsible for accepting applications, conducting fieldwork to gather necessary information, writing silvicultural prescriptions, developing and administering contracts, and certification and payment.

Table 2. Anticipated NRCS Deliverables

Activities	2020	2021	2022	2023	2024	Total
Forest Stand Improvement (NRCS-666)	150 ac	300 ac	400 ac	400 ac	250 ac	1,500 ac
Woody Residue Treatment (NRCS-384)	150 ac	300 ac	400 ac	400 ac	250 ac	1,500 ac
Tree and Shrub Pruning (660)	50	150	250	250	150	850 ac
Forest Trails and Landing (655)	200 ft	500 ft	1000 ft	1000 ft	500 ft	3,200 ft
Tree/Shrub Site Prep. (490)	20 ac	50 ac	100 ac	100 ac	50 ac	320 ac
Tree/Shrub Establishment (612))	10 ac	20 ac	50 ac	50 ac	25 ac	160 ac
Forest Management Plans (106)	2 each	4 each	5 each	5 each	4 each	20

Budget projections are based on an average of $1,200/ac extrapolated from the 2020 cost list. Actual costs may vary from year to year based on changes to the cost list and individual practices selected. Future budget projections have been conservatively estimated using anticipated producer interest, average property sizes, and engagement with landowners to date.

Table 3. NRCS Budget Projections

CONTRIBUTIONS	2020	2021	2022	2023	2024	TOTAL
NRCS EQIP FA	$180,000	$360,000	$480,000	$480,000	$300,000	$1,800,000

Screening and Ranking

A screening tool and ranking questions will be used to prioritize projects based upon conservation benefit and the feasibility for the project to be completed in the scheduled time-frame to ensure the proposed projects meet our objectives.

Potential Ranking Questions:

1. Will proposed practices promote white pine and will the resulting stand have less than 33% Douglas Fir and/or grand fir?
2. If present within the stand will the white pine component benefit from practices either through releasing existing trees or planting of blister-rust resistant stock?

3. Will white pine pruning (660) occur on trees that are not currently infected with blister rust?

4. **Screening:**

- Reference Montana NRCS Bulletin MT300-19-23, attached to this document

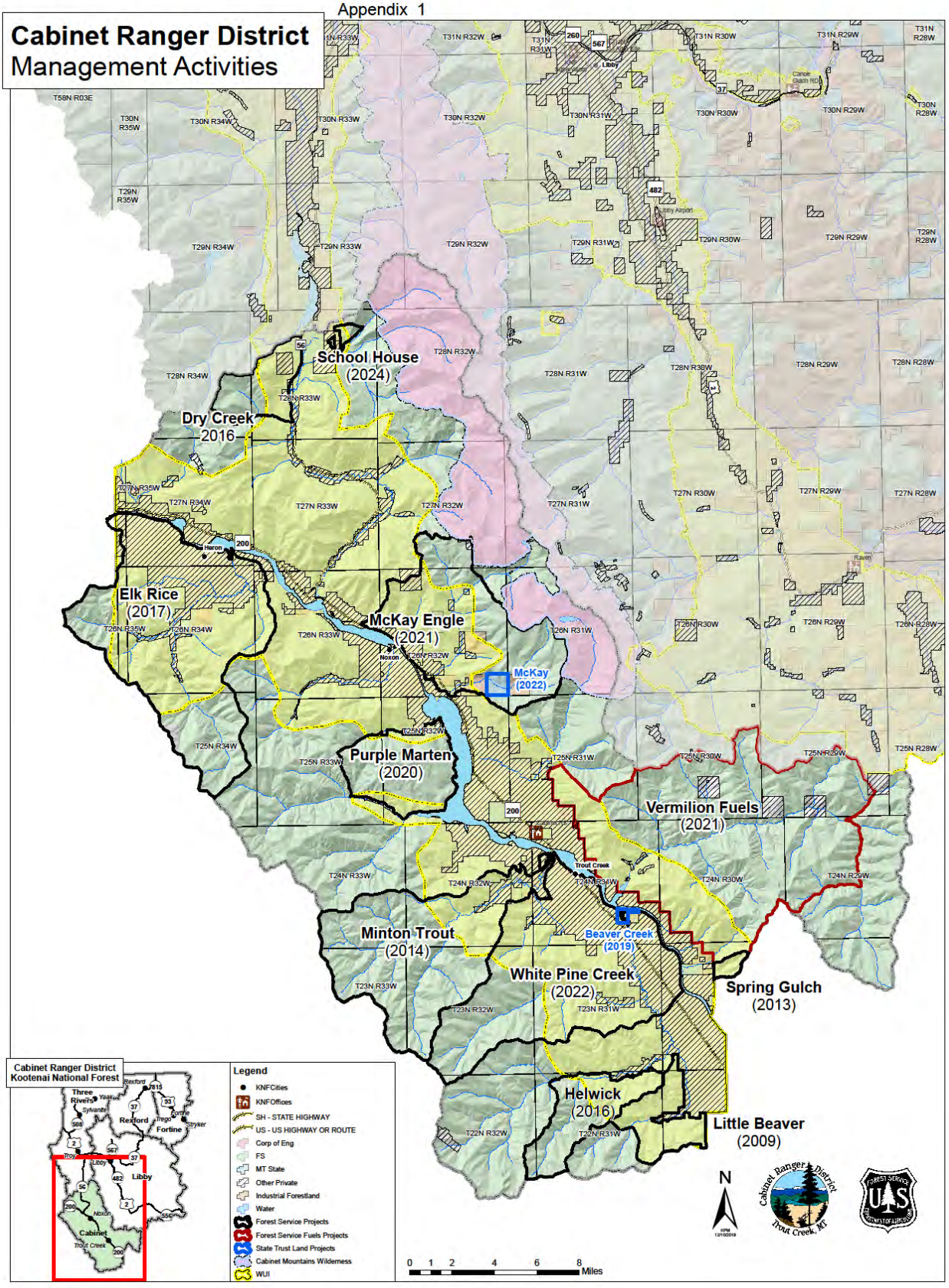
Progress Evaluation and Monitoring

NRCS annually will analyze the TIP interest level and monitor implementation of active contracts, to plan and direct workloads of staff.

A stand level forest inventory will be completed before contract obligation to document stand conditions and to develop a silvicultural prescription. The silvicultural prescription will be used to determine practices to include in the contract and for practice certification when conditions in the prescription have been attained. Inventory will include documentation of the existing species composition within stand, stand density and tree spacing as well as disease and forest-health attributes. Documentation of pre-treatment species composition and relative density within the stand will be used as a metric during evaluation and monitoring post-treatment with the expectation that the percentage of white pine within the stand should increase following treatment. Pre and post-treatment photos will be used to visually show stand improvements. Each treatment area will have at least one georeferenced pre and post-treatment photo-point.

Each active contract will be overseen by field office staff. All contract items will be certified with an on-site field visit, with photos and maps to document the conditions at practice certification. After contract completion, the landowner is responsible for monitoring and documenting stand conditions during Tree Farm/Forest Stewardship forest management plan updates, and NRCS field staff will assist if requested.

Appendix 1


Cabinet Ranger District
Management Activities
School House
(2024)
Dry Creek
2016
Elk Rice
(2017)
McKay Engle
(2021)
McKay
(2022)
Purple Marten
(2020)
Vermilion Fuels
(2021)
Minton Trout
(2014)
Beaver Creek
(2019)
White Pine Creek
(2022)
Spring Gulch
(2013)
Helwick
(2016)
Little Beaver
(2009)
Cabinet Ranger District
Kootenai National Forest
Legend
KNFCities
KNFOffices
SH - STATE HIGHWAY
US - US HIGHWAY OR ROUTE
Corp of Eng
FS
MT State
Other Private
Industrial Forestland
Water
Forest Service Projects
Forest Service Fuels Projects
State Trust Land Projects
Cabinet Mountains Wilderness
WUI
0 1 2 4 6 8
Miles
N