



## **Black Hills Land Analysis LLC**

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12007 Coyote Ridge Road  
Deadwood, SD 57732  
(605) 578-1556

6/21/2021

Tract Y, Lots 1-15  
Spearfish Mountain Ranch, LLC  
C/O Keating Resources LLC  
2121 N Pearl Street, Suite 300  
Dallas, Tx 75201

This wildland fire mitigation plan and associated recommendation pertains to the below described property:

LOTS 1 THROUGH 15 OF TRACT Y, INCLUDING TRACT Y BEING PORTIONS OF THE SW1/4NW1/4 OF SECTION 21 AND THE SE1/4NE1/4 AND THE N1/2SE1/4 OF SECTION 20, ALL LOCATED IN T6N, R4E, B.H.M., LAWRENCE COUNTY, SOUTH DAKOTA. *See attached Tract Y Lot Layout map.*

Tract Y is located approximately .3 miles west of the city of Whitewood. Access to the property is off Oak Street. The primary fire department for this property is the Whitewood Volunteer Fire Department. The fire station is approximately 1.3 miles distance by road. The Whitewood Volunteer Fire Department has current mutual aid agreements with all of the other fire departments within Lawrence County. If needed they can call for mutual aid from other county fire departments

The goal of a wildland fire mitigation plan is to reduce the impact wildfire has on the landscape and associated values. The key to reducing the effects from wildland fire is to reduce fire severity by performing hazardous fuels reduction activities. Reduced fire effects makes it much easier to protect life, property and resources.

The National Cohesive Wildland Fire Management strategy suggests focus on three primary factors:

- Maintain landscapes in a condition that would make them resilient to wildland fire events.
- Create fire adaptive communities that will withstand wildland fire without loss of life and property.
- All suppression activities are implemented in a safe, effective, efficient, risk-based environment.

This property is situated in a wildland fire environment due to the fuels presented by Ponderosa pine, dead and down forest litter and fine flashy fuels consisting of grass, Forbes and regeneration conifer.

The fire history map indicates several large fires have occurred within a 6-mile area, including the Two Bit / Pillar Peak fire in 1893 which burned 1,675 acres, the Deadwood fire in 1959 which consumed 4,547 acres, the Grizzly Gulch fire of 2002 which covered 11,589 acres and the Camp 5 fire in 2005 which burned 776 acres. Many additional point fire ignitions are also recorded in this area but these were all small fires that were extinguished before they spread into larger conflagrations. This fire history is documented by South Dakota Wildland Fire Division and the US Forest Service. *See attached Fire History map.*

To reduce fire effects and fire severity impacting a property and associated values, the following guidelines should be followed.

1. **Mature Overstory conifers:** Overstory conifers should be maintained with an open canopy condition. This will reduce the risk from sustained crown fire activity. An average of 20 feet between the canopy on level ground will significantly diminish crown fire potential. On slopes greater than 8%, the spacing should be increased to an average of 30 feet or more. When selecting trees for removal, large dominant trees that are straight, with good form and vigor should be left providing they meet the minimum spacing requirements. Remove all storm bent, or damaged trees including trees affected by Mountain Pine beetle. Split top or trees with stem cankers should be removed. Remove unhealthy or defective trees first and then remove remaining trees until desired spacing is achieved. Conifers can be grouped as long as adequate spacing (20'– 30') is left around these small groups to separate them from the surrounding conifer stands. Branches should be trimmed up a minimum of 6-8 feet to reduce ladder fuel effects.
2. **Midstory Conifers:** Generally, these are 3" to 8" diameter trees and should be maintained with a canopy spacing of a minimum of ½ the height of the tree. As the trees continue to grow, and the canopy gets thicker, additional maintenance or thinning will be necessary to maintain adequate conifer canopy spacing. Lower branches on these trees should be trimmed up to reduce surface fire from spreading vertically up these trees into the conifer canopy. Steep slopes may require additional spacing of 30% more to account for increased fire behavior due to the steepness of the slope and availability of up-slope fuels. Ladder fuels should be trimmed up 6 feet.
3. **Understory / Regeneration Conifers:** Generally, these trees are less than 3" in diameter with branch habit close to the ground. They are often referred to as ladder fuels. Conifer understory should be thinned to reduce horizontal and vertical fuel loads. Ladder fuels can cause fire to spread vertically into the conifer canopy above them. These trees should also have ladder fuels trimmed up to keep the lower branches above the surrounding surface fuel which may reduce vertical fire spread. Steep slopes may require additional spacing of 30% more to account for increased fire behavior due to the steepness of the slope and availability of up-slope fuels.

4. **Surface Fuels:** Fine flashy fuels such as prairie grasses should be managed to reduce spread rate and surface fire intensity. Cured grass and accumulated surface fuels can cause a fast-moving intense fire that can grow very large in a short period of time. Grass should be mowed or hayed later in the season when cured brown. Surface fuels should be significantly reduced or eliminated in close proximity to other fuel loads or values. This would include all dead and down vegetation that is available to burn.
5. **Deciduous Vegetation:** Stand conditions can also be improved by promoting existing deciduous vegetation. This can be accomplished by thinning conifers in the general vicinity of hardwoods. Conifers will take over the deciduous stand if left unmanaged. Hardwoods not only create diversity but they also interrupt fire spread and effects across the landscape. Deciduous vegetation generally does not contribute to high fire intensity. There are established deciduous stands on the property that should be encouraged by thinning the conifer vegetation that are encroaching into them.
6. **Topography:** Slope, aspect and the shape of the landscape will influence wildland fire behavior. Typically, south and west aspects are drier and burn more aggressively. Steeper slopes also cause more aggressive fire behavior due to the availability and pre-heating of up-slope fuels. This property is located at the top of the slope which needs to be considered when planning wildland fire mitigation activities.
7. **Survivable Space:** Structures and other values should have adequate survivable space developed and maintained based on existing fuel loads, topography and expected fire behavior. Heavily timbered areas may require 100 feet or more of survivable space depending on slope, aspect and fuel loading. As a wildland fire approaches a value (structures), fuel loads should be managed to reduce fire intensity and crown fire potential. Once within 100 feet of existing values, the conifers should be maintained with adequate canopy spacing which would not support a crown fire. This will force the fire to stay on the ground and burn with less intensity. From 100 to 30 feet from values, the fuels should be reduced to further decrease fire effects of an approaching wildfire. Once a fire is within 30 feet of the structures, flame lengths should be 1 foot or less. Within the 30-foot survivable space, conifers and other hazardous fuels should be discouraged. Open space with grass as a fuel component may only require 30 feet of survivable space. Within 5 feet of structures there should not be any available fuel to burn. This will reduce the risk of initial ignition of structures from direct flame impingement. Proper fuels management will help keep fire effects in check as it approaches values on the landscape.
8. **Firewise:** There may be an opportunity to reduce the risk of initial ignition of structures by implementing Firewise building materials and practices. *See attached Fire Resistive Building Recommendations.* This will help the fire service personal protect the property in the event of an uncontrolled wildland fire. There are many sources of information about reducing wildland fire risk. The Lawrence County Community Wildfire Protection Plan is a good resource for information. This and other publications are available at [Lawrence County](#). In addition, the

NFPA website has an abundant amount of information available pertaining to Firewise construction and hazardous fuels.

<https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA>

A multi-stage open stand condition between the mature overstory, midstory and understory conifers provides a good strategy for reducing wildland fire effects. Fuel separation horizontally and vertically between different stages of conifers will reduce fire spread potential. Midstory and understory conifers should be removed from within the drip line of overstory conifers.

Regeneration conifers should be spaced away from overstory and midstory conifers to disrupt vertical fuel loads. Managing fuel breaks will help control the spread of wildfire by interrupting fuel continuity. Proactive forest/fuel management may help a property survive on its own during a fire event without the intervention of fire suppression personnel. Preserving the environmental sustainability of a property will also protect the aesthetics and value of the property. A well-maintained right-of-way will provide an effective fuel break which can provide protection from an advancing wildland fire. A properly managed right-of-way will also provide safe ingress/egress during a wildfire. Fuel breaks may also provide a good place to perform tactical operations for fire suppression activities.

Properly managed forest stands not only reduce the risk from wildfire, but they are also less susceptible to infestation from insects such as the Mountain Pine Beetle and the Pine Engraver Beetle.

After completing a site visit and reviewing the existing conditions of Tract Y, I would recommend the following treatments to reduce the risk from wildfire to Tract Y and associated values.

Three different units have been identified based on fuels, topography and land usage for hazardous fuels reduction projects on the property. *See attached Tract Y Treatment map*

**Unit 1:** These areas are hardwood and conifer mixed stands. The draw bottoms are generally deciduous vegetation with more conifers present mid slope to the ridge tops. The majority of this area is on a slope greater than 8% which will increase fire spread rate and intensity. Treatments performed on overstory, midstory and understory conifers within the survivable space of structures and values should follow the guidelines outlined above. Reducing the risk of wildfire from torching and crowning as it comes upslope toward the values will be critical for wildland fire suppression efforts to be effective. This will generally require 20-25 foot of conifer canopy spacing on slope up to 20%. Slopes on a south or west aspect with slope greater than 20% would require 25-30 foot spacing. Midstory and understory conifers in steeper slopes should be thinned to follow the numbered guidelines listed above. Ladder fuels should be trimmed up a minimum of 6 feet. Surface fuels should be significantly reduced or eliminated. Hardwoods should be promoted by thinning conifers near them.

**Unit 2:** These areas are primarily prairie grass and Forbes. Tall grass that cures in late summer is dry and available to burn. The risk is these fine flashy fuel loads is that they will support intense fast moving surface fire. Keeping grass mowed short and well irrigated is a good tactic to mitigate this risk. Roads and driveways will act as fuel breaks to help reduce wildland fire spread within Tract Y. Values situated in a grass fuel type should have a well-maintained survivable space within 30 feet or more of all structures. Conifer vegetation should be discouraged within the 30-foot survivable space of structures.

**Unit 3:** This unit is primarily a commons area and allows access into the community. It is generally fairly steep and should follow the guide lines for overstory, midstory and understory conifer treatments as outlined above. More aggressive treatments on steeper slopes will help provide safer ingress/egress for the community in the event of a uncontrolled wildland fire.

**These recommendations do not guarantee against any injury or loss of property, real or personal, nor injury to persons, but are only intended to reduce the risk from wildfire, and if the plan is implemented and completed and properly maintained.**

Sincerely,

**Rob Mattox**

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## Fire Resistive Building Recommendations

- A. Shingles shall be Class A, B, or C fire resistant material.
- B. No wooden shake shingles are allowed.
- C. Vents shall be screened with a corrosion resistant, noncombustible wire mesh with the mesh opening not to exceed nominal 1/8" in size.
- D. Eaves shall be boxed in with 5/8" nominal sheathing or noncombustible materials.
- E. Where the roof profile allows space between the roof covering and the roof decking, the spaces shall be constructed to prevent the intrusion of flames and embers, be fire stopped with approved materials, or have additional assembly components of noncombustible materials to prevent ignition.
- F. Attic or foundation ventilation louvers or ventilation openings in vertical walls shall be covered with nominal 1/8" mesh corrosion-resistant metal screen or other noncombustible and approved material that offers equivalent protection.
- G. No attic ventilation openings or ventilation louvers shall be permitted in soffits, in eave overhangs, between rafters at eaves, or in other overhanging areas on those exposures facing hazardous vegetation.
- H. Attic spaces shall be ventilated as approved for the building configuration, the climatological conditions of the site, and the moisture and temperature conditions associated with the occupancy and use of the building.
- I. All overhanging projections and overhanging buildings shall be of heavy timber construction; be constructed of noncombustible material, fire retardant treated wood, or other ignition resistant material; or be 1-hour fire-rated assembly.
- J. Exterior vertical walls shall meet the requirements for heavy timber construction, ignition resistive material, fire-retardants-treated wood, or a minimum 20-minute fire-rated assembly where walls are potentially exposed to a wildland fire.
- K. All exterior walls shall be protected with 2" nominal solid blocking between exposed rafters at all roof overhangs, under the exterior wall covering on all sides exposed to native vegetation.
- L. When appendages and projections are attached to exterior fire resistive walls, they shall be constructed to maintain the fire resistive integrity of the wall.
- M. Structural elements that result in or could result in the collection of combustible materials proximal to the structure shall be protected.
- N. Exterior windows, windows within exterior doors, and skylights shall be tempered glass, multi-layered glazed panels, glass block, or have a fire-resistance rating of no less than 20 minutes.
- O. Window screening shall be noncombustible mesh and installed to prevent the collection of firebrands and embers or their entry into open windows.
- P. Exterior doors shall be solid core wood no less than 1¾-inch thick, approved noncombustible construction, or have a fire protection rating of no less than 20 minutes.
- Q. Vents for attic and sub-floor ventilation shall be screened with a corrosion-resistant wire mesh, with the mesh opening not exceeding nominal 1/8" in size.
- R. No vents shall be installed in a location that faces heavy vegetative fuels.
- S. Every fireplace and wood stove chimney and flue shall be provided with an approved spark arrester constructed of a minimum 12-gauge welded wire or woven wire mesh, with openings not exceeding ½".
- T. Vegetation shall not be allowed within 10 ft. of a chimney outlet.





U. Accessory structures shall meet all of the requirements of this section or shall be separated from the main structure by a minimum of 30 feet.

V. Permanently located mobile and manufactured homes with an open space beneath shall have a skirt of noncombustible material or material that has a minimum fire-resistive rating of 20 minutes.

W. Any enclosed space beneath the mobile or manufactured home shall be vented according to C above.



## Legend

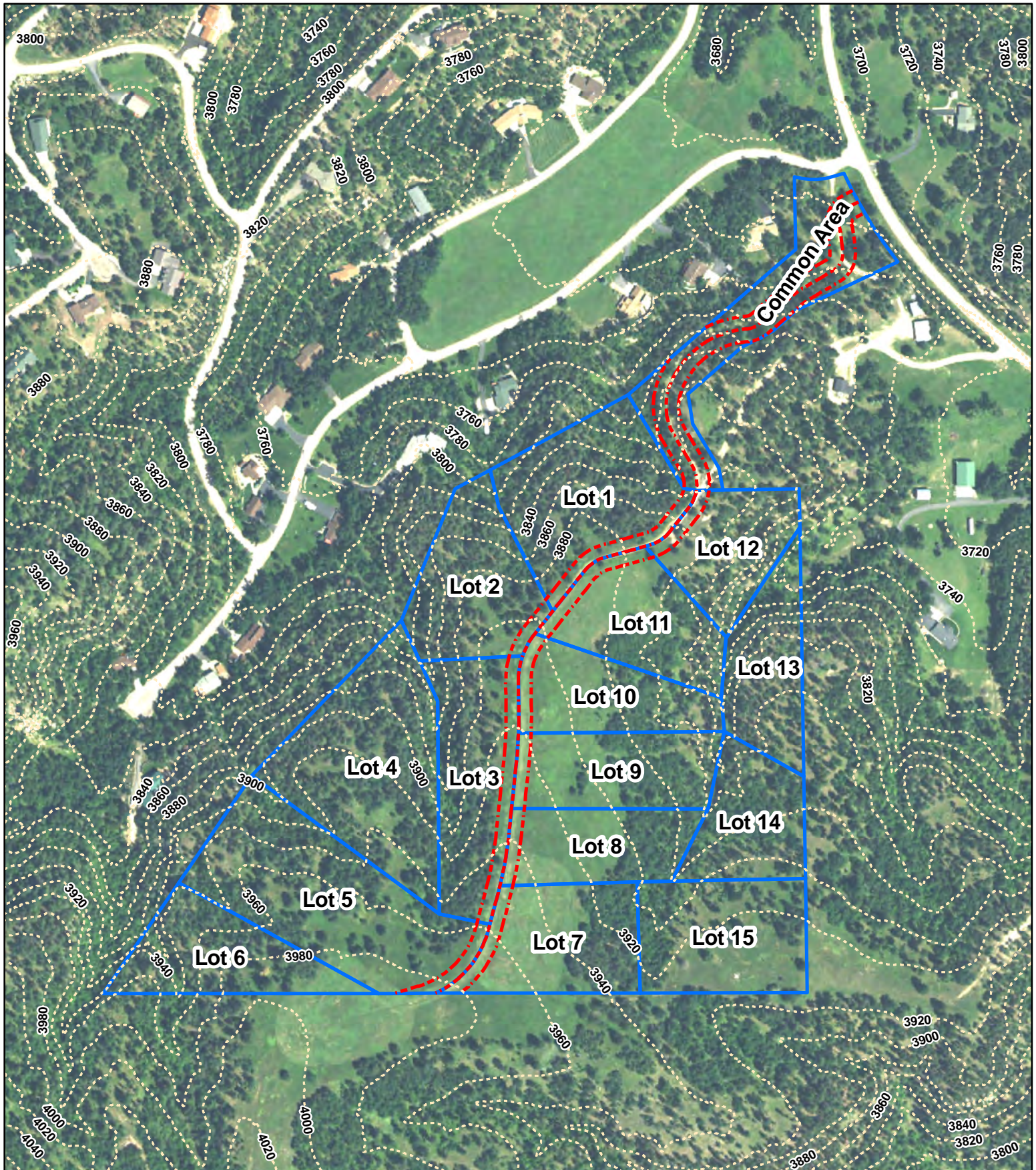
-  Roads
-  R.O.W.
-  20' contours
-  Tract Y Lot Configuration



# Tract Y Lot Layout




0 160 320 640 Feet

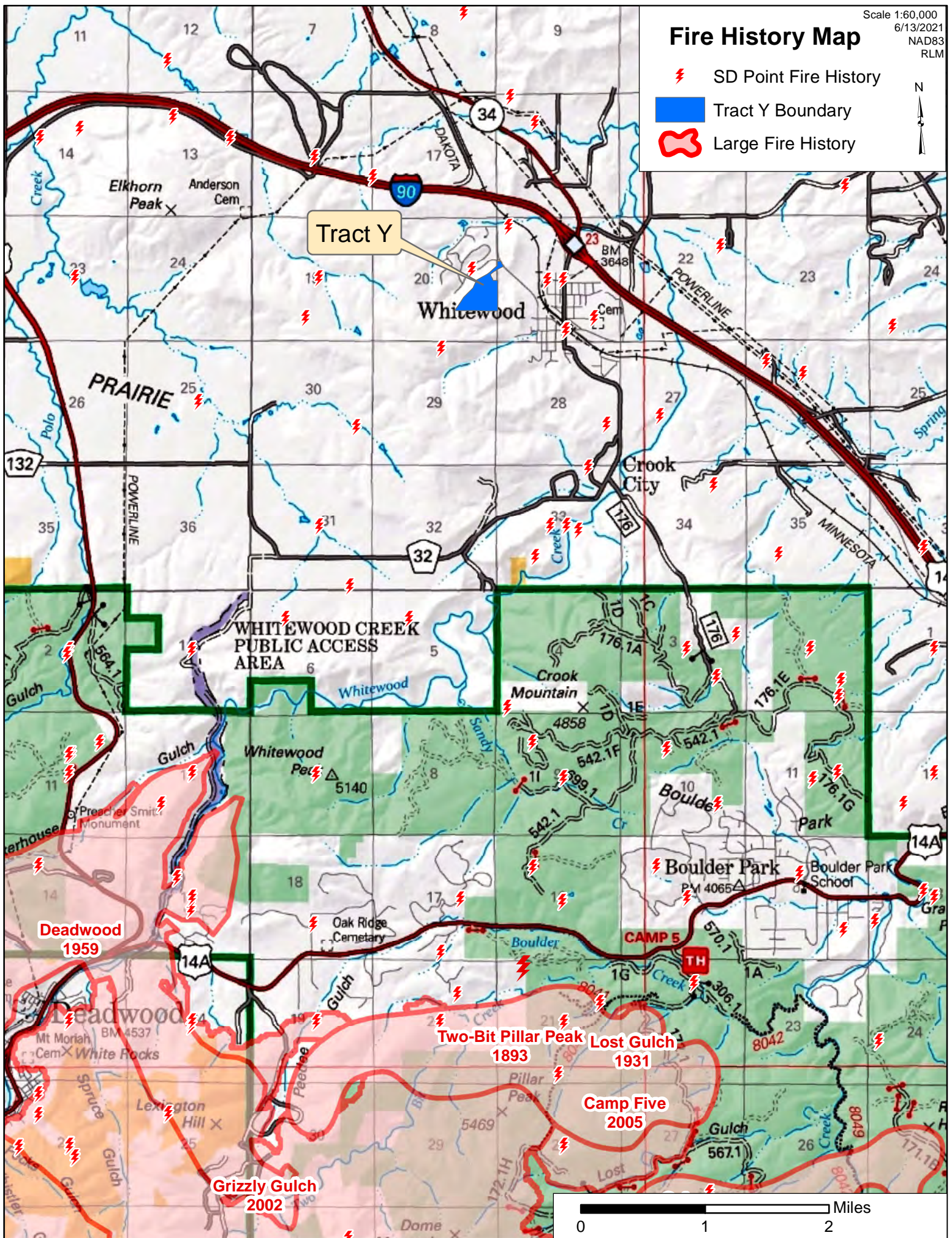
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## Fire History Map

-  SD Point Fire History
-  Tract Y Boundary
-  Large Fire History





# Tract Y Treatment Map

-  R.O.W.
-  Tract Y Treatment
-  20' Contours



Scale 1:3,500  
6/20/2021  
NAD 83  
RLM

0 137.5 275 550 Feet

