

SANTA FE TRAIL RANCH

Community Wildfire Protection Plan



Prepared by Land Stewardship Associates, LLC at the request of the Santa Fe Trail Ranch Property Owners Association.

Signatory Page

The following people have reviewed and approved the Santa Fe Trail Ranch Community Wildfire Plan. It is now ready for implementation.

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La Veta District, Colorado State Forest Service

Date

Robert L. Scott, President, Board of Directors,
Santa Fe Trail Ranch Property Owners Association

Date

Tim Nawrocki, President, Board of Directors,
Fisher's Peak Fire Protection District

Date

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- I** - Definition of Terms
- J** – References †
- K** – Sample Specifications for Turnarounds

- **Appendices A, B, C, are Large size Maps and are available for download on the Forest Health Wildfire Mitigation Website at www.sftrforest.org. (these are large files at 4.8, 4.8, and 20.5 Mb respectively)**
- **† References like the maps are also available for download on the Forest Health Wildfire Mitigation Website at www.sftrforest.org.**

This is being done to cut-down on copying and mailing costs.

I. COMMUNITY IDENTIFICATION & DESCRIPTION

The Santa Fe Trail Ranch (SFTR) community area is in Las Animas County, south of Trinidad Colorado, near the Colorado/New Mexico state line. It covers approximately 16,800 acres and ranges in elevation from 6,500 to 8,100 feet. Interstate Highway 25 provides primary access to the ranch. See the attached vicinity map for a comprehensive understanding of the ranch location.

SFTR contains four hundred and fifty four (454), 35 acre parcels, one hundred and forty five (145) of which have structures on them. Approximately six to eight new homes are being built each year. Eighty-three (83) miles of reasonably good dirt and gravel roads provide year round access.

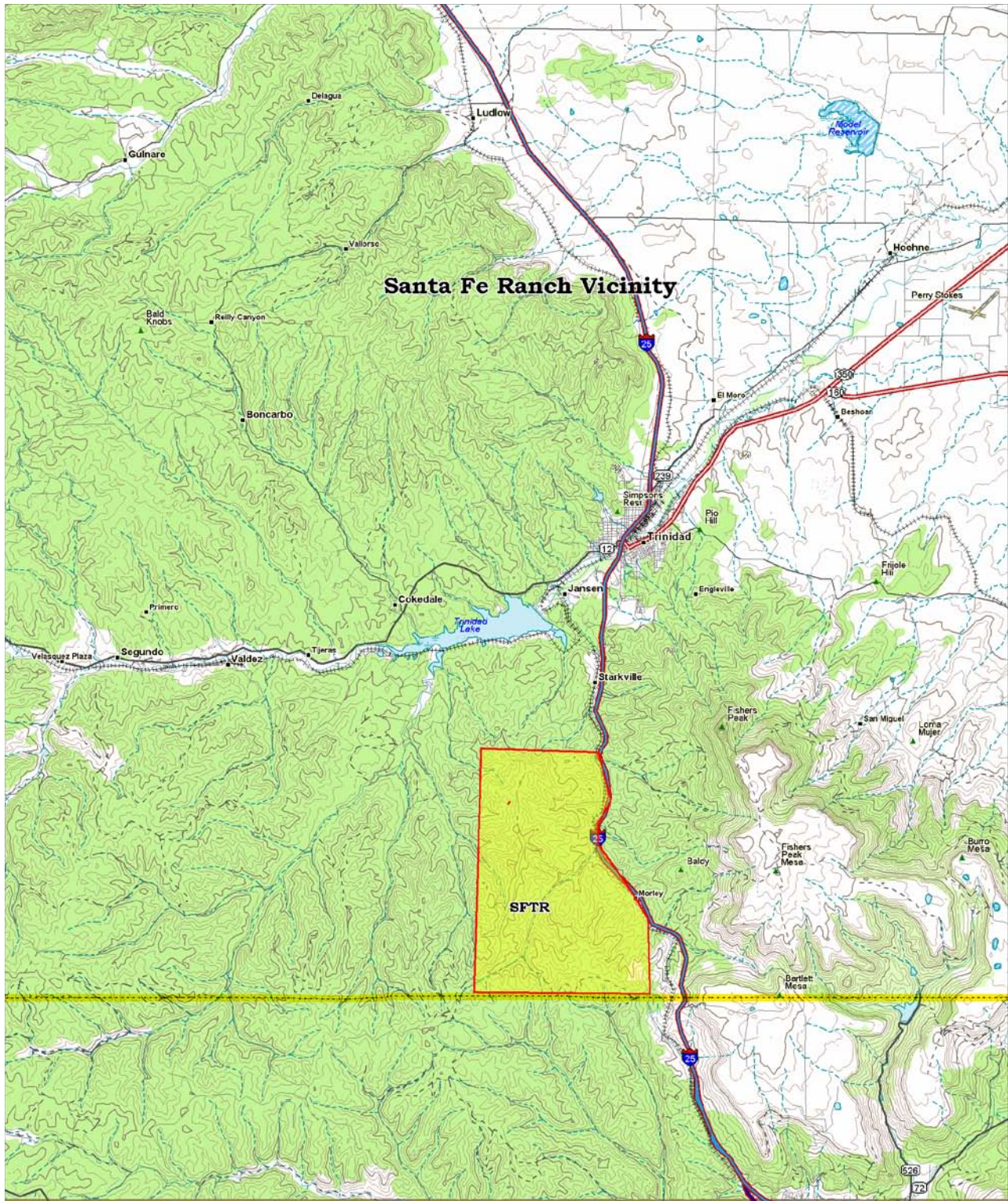
There is a very active property owner's association guiding many of the activities on the Ranch. Defensible space activities are wide spread and evacuation planning has been done.

Previous fires in the area have created a vegetative tapestry of pinyon, juniper, ponderosa pine and Douglas fir in the overstory with a rich shrub understory composed of Gambel oak, New Mexican locust, mountain mahogany, skunk-bush and chokecherry. This vegetative blanket lays on a highly dissected series of ridges, draws and canyons. Slopes range from ten to fifty percent with an average approximating thirty percent.

Large wildfires are not unusual in the area. The Morley fire burned 300 acres on the Ranch in 1978 and was followed by Morley fires 2 & 3 in 1979 & 1980. The fire season of 2002 provided a serious wake up call to Colorado residents living in forested/wooded environs. The Crazy French (300 acres), Spring (33,000 acres) and James John (6,800 acres) fires were all in the Santa Fe Trail Ranch vicinity. These fires increased Ranch residence awareness of the hazards of living in a wildland setting.

Initial attack for all wildland and structure fires on Santa Fe Trail Ranch is provided by the Fisher's Peak Fire Protection District, Volunteer Fire Department.

A public meeting was held on February 18th, 2006 to review the draft Community Wildfire Protection Plan (CWPP) and incorporate changes suggested by the property owners, fire district representatives, Colorado State Forest Service (CSFS) personnel and Las Animas County Sheriffs Department.



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II. COMMUNITY ASSESSMENT

The overall risk to the community from wildland fire is HIGH. This section will discuss the factors considered and contributing to the overall rating.

Fuel Hazards

Dense stands of conifer (ponderosa pine, pinyon pine, Douglas-fir and juniper) and brush (Gambel oak, New Mexican locust, mountain mahogany, and chokecherry) cover the Ranch. Fuel ladders are abundant and will lift ground fire into the crowns of the overstory. There are only a few small meadows scattered throughout the Ranch. Fire Behavior Fuel Models 1, 4, 6, 8, & 9 (Anderson 1982) are all found in various associations with one another. All but fuel models 8 & 9, have high rates of spread under relatively mild weather conditions. Table 1: Fuel Models Found in Santa Fe Trail Ranch provides a brief description of these five key fuel models.

All stands adjacent to structures with crown closures greater than forty percent are problematic. Continuous surface and crown fuel arrangement, both horizontal and vertical, render this area susceptible to torching, crown fire, and ignition by wind born embers, even under moderate weather conditions. The following Fire Hazard & Mitigation Map shows the severity of fire hazard for the Ranch with fully ninety percent (90%) rated as high fire hazard.

Local topography further aggravates fire behavior and control. Slopes range from ten to fifty percent with most hillsides ranging from twenty to thirty percent.

Fuel Models

Fuel models are a means of describing a wide variety of combustible conditions found in a wildland environment. Thirteen (13) standardized fuel models are used in wildfire behavior prediction. Fuel size class, fuel loading in tons/acre, fuel bed depth, and fuel continuity across a landscape are all factors that are considered when assigning a fuel model to a specific tract of land. Since it is unrealistic to expect thirteen (13) descriptions to represent the wide continuum of fuel beds found in the wild, fuel models are often combined by the percentage of an area they cover. Table 1: Fuel Models found in Santa Fe Trail Ranch concisely describes fuel models in the development.

Table 1: Fuel Models Found in Santa Fe Trail Ranch

Fuel Model	Description
1	Grasslands generally less than 1 foot deep
4	Shrub stands > 6 feet tall
6	Shrub stands < 4 feet tall
8	Closed canopy stands with short-needle conifers or hardwoods that have leafed out support fire in the compact litter layer.
9	Closed stands of long needled pine or hardwood stand with freshly fallen leaves

Here are a few representative photos of fuel models found on SFTR



Fuel Model 1/9



Fuel Model 6

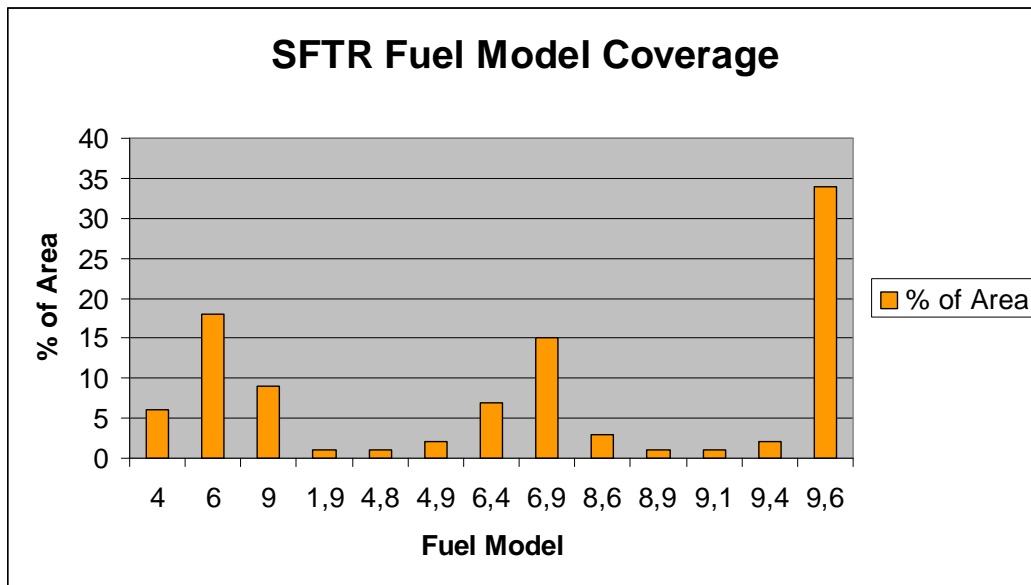


Fuel Model 9



Fuel Model 9/6

Chart 1: Fuel Model Coverage on Santa Fe Trail Ranch



Risk of Ignition and Wildfire Occurrence

The robust vegetative mosaic found on the ranch is living testimony to fires role in ecosystem dynamics in the area. Most contemporary fires are lightning caused but human caused fires are expected to increase as more homes are built on the ranch. Surprisingly there are very few railroad fires along the tracks across Raton Pass. Fires are normally prevalent along steep railroad grades. The Burlington Northern & Santa Fe Railroad Company is doing a good job of wildfire prevention by keeping their right of way mowed and free of flammable vegetation.

The Morley fire of 1978, burned three hundred (300) acres on the Ranch. Normally two to three small fires occur on the Ranch each year. 2002 was a very active wildfire year. Three major blazes burned over forty thousand acres in the SFTR vicinity.

Low fuel moistures and low relative humidity are common in the area, as are periods of high winds. When dry and windy conditions coincide the stage is set for large, troublesome wildfires.

Fires originating in or near the community are the most immediate concern, but fires starting well beyond the boundaries of the planning area can have profound effects upon the Ranch. Rapid rates of spread and long distance spotting (starting of new fire by wind blown embers) are the norms for fires in the vicinity. The Spring fire of 2002 started in New Mexico and made an eleven mile run toward Colorado in just one afternoon. Table 2 below provides insight into potential fire behavior on a bad day at Santa Fe Trail Ranch.

Table 2: Santa Fe Trail Ranch Fire Behavior Prediction

Fuel model	Rate of Spread (miles/hr)	Flame length (feet)	1 hour fire size (acres)	1 hour Fire perimeter (miles)	Safety zone size (acres)
1/9	2.25	8	852	5.00	2
4	2.63	32	995	5.76	20
4/8	.17	35	373	3.71	25
4/9	2.00	35	514	4.36	26
6	1.45	11	271	3.16	3
6/4	2.54	35	825	5.51	26
6/9	.61	9	64	1.39	2
8/6	.46	9	37	1.05	2
8/9	.11	4	3	0.26	0.5
9	.17	4	6	0.40	0.5
9/4	1.51	32	337	3.35	21
9/6	.80	10	95	1.78	2.5

Note: Shaded zones are well beyond hand crews and engine suppression threshold.

Fire behavior predictions are based on the average weather conditions for the month of June 2002 recorded at the Bosque (a.k.a. Cuchara) Remote Automated Weather Station (RAWS) #56203. This RAWS sits at 8,174 feet elevation and is reasonably close to SFTR.

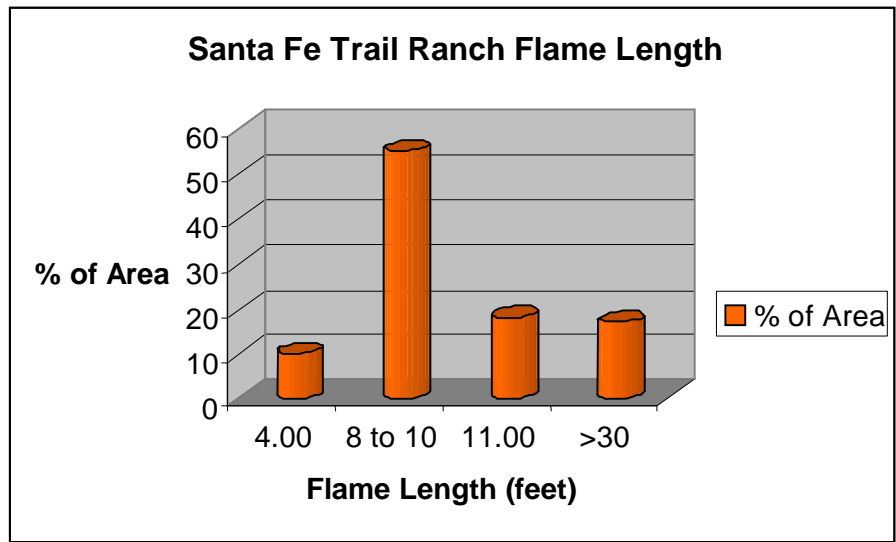


Chart 2: Flame lengths on Santa Fe Trail Ranch

Fuel Hazard Map Showing Proposed Fuel Breaks

Table 3: Fire Hazard Based On Rate of Spread & Resistance to Control

Fuel Model	ROS	RTC	Hazard	% of Area
4	High	High	High	6
6	High	High	High	18
9	Moderate	Moderate	Moderate	9
1,9	High	Moderate	High	1
4,8	Moderate	High	High	1
4,9	High	High	High	2
6,4	High	High	High	7
6,9	High	High	High	15
8,6	High	High	High	3
8,9	Moderate	Moderate	Moderate	1
9,1	High	Moderate	High	1
9,4	High	High	High	2
9,6	Moderate	High	High	34

NOTE: ROS = Rate of Spread & RTC = Resistance to Control

Community Values at Risk & Hazard Assessment

Values: One hundred forty five (145) of the four hundred fifty four (454), or 32%, of the tracts on the Ranch have structures on them. The structures range from substantial permanent residences to tuff sheds, travel trailers and metal sheds. Approximately six to eight (6-8) new homes are being built each year. Fifty percent (50%) of the structures are occupied year long.

Ranch owners place a high premium on their natural surroundings and the visual quality of the landscape. Vast expanses of heavily burned, charred forest are objectionable whether structures burn or not. If the view is seriously eroded much of the intrinsic value of the home will also be lost.

A large, intense fire will also compromise watershed values and cause sediment and turbidity issues along Raton Creek and Trinidad Lake. Most of the ponds on the ranch which are impounded by earthen dams would be filled with sediment, compromising wildlife and livestock watering opportunities.

Access: Eighty three (83) miles of gravel and dirt roads provide reasonably good access to the Ranch. Without an accurate map or detailed instructions it could be very difficult for first responders to find a specific address even though virtually every intersection is signed. There are approximately seventy (70) named roads within STFR. Road names are also confusing at times with several similar road names and some road names changing in unusual ways at intersections. Only sixty four (64) of the two hundred five (205) driveways have

addresses posted at the entrance. Sixty (60) of the driveways do not have structures at the end of the drive.

Addresses are in serious disarray. There are several different numbering systems in use. With only thirty one percent (31%) of the driveways numbered in a confusing address system the stage is set for first responders to be slow in reaching any emergency on the Ranch.

Road grades often approach ten percent (10%) on the main arterials in the community. Driveways can be as much as fifteen percent (15%). Most dead end roads have “No Outlet” signs at the junction with the main road. Turnarounds and cul-de-sacs at the end of the roads are inadequate for large structure fire equipment.

Risk: Three kinds of risk are associated with wildland fire. The first concern is the risk to property owners trying to evacuate under less than optimal conditions. Second is the risk to firefighters attempting to protect property. Third is the risk to the property from wildfire. The concept of defensible space addresses both the second and third facets of risk under one umbrella.

Defensible space is an area around the structures where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure and lower the intensity of the fire as it passes the developed area. It also reduces the chances of structure fire moving from the building to surrounding vegetation. Defensible space provides room for firefighters to do their jobs. A house is likely to withstand a wildfire if vegetation is managed to reduce a fire's intensity. Structure design and construction also influence its survivability when a wildfire passes through the neighborhood. Removing flammable materials such as fire wood, lumber and gasoline from the decks and base of structures will pay big dividends when the ember storm hits the home.

Triage: Structure triage was conducted on each tract with buildings on it. Triage is a concise decision making process that is used if/when a wildfire threatens multiple structures simultaneously. See Appendix H: Structure Triage for a brief description of the triage process. The following observations are gleaned from the site visits.

- ✓ 51% of the structures were defensible while another 9% were marginally defensible depending upon fire intensity. That leaves forty percent (40%) of the structures within the Ranch as non-defensible. This “*defendability*” rating is a summary of all the factors listed below.
 - 57% of the lots had adequate space to turn fire control apparatus around.
 - A safety zone was immediately available at 26% of the structures.

- 95% of the driveways were in good enough condition to be considered escape routes for firefighting resources.
- 34% of the tracts have good defensible space, while another 34% are fair and the remaining 32% are poor.
- 64% of the structures received a good triage rating, 22% were rated as fair and 14% poor.
- One of the most serious problems observed during triage was houses sitting on the edge of a steep slope with heavy fuels below the structure.

It is important to understand the role of triage in this community wildfire protection plan. It is a quick, inexpensive way to determine overall community wildfire risk and helps to identify areas to focus improvement efforts. Its utility during an actual wildfire depends upon the nature of the wildfire. When only one structure is threatened, firefighting resources are usually assigned to protect that single structure, unless it is a death trap and totally undefendable.

During a large wildfire scenario when more structures are threatened than there are firefighting resources to protect them, this triage work will help the Incident Commander assign scarce resources to the places where they have the best chance for success.

Maps developed for this Community Wildfire Protection Plan identify structure location and defendability. The CWPP is an ever evolving document and will be revised on a regular basis to reflect new information about structure defendability and other important fire control features on the Ranch.

Evacuation: An “Emergency Services Handbook” was prepared for the Santa Fe Trail Ranch community by their Emergency Services Committee. It has an evacuation section that is very comprehensive. The division of the community into six evacuation zones might be re-evaluated to take into account common evacuation routes and numbers of residents in each area.

There are several potential evacuation routes out of the Ranch. The main entrance road is the best alternative for threats from the south. A locked gate near the old Morley mine site provides a second escape route, which leads across the railroad tracks and out to the interchange at Exit #2 on highway I-25. Use of this exit has been negotiated with the Burlington Northern & Santa Fe railroad as an emergency exit only.

A gate off of the south end of Owen Baldwin Parkway onto a logging road on Vermejo Park Ranch provides an opportunity for residents in that area to exit the SFTR CWPP

Ranch if a threat comes from the north or east. Vermejo Park Ranch personnel installed the gate to provide emergency ingress and egress for both SFTR and the Vermejo Park Ranch. Another exit portal exists off of Alpine Meadows Drive. It provides access to another good dirt road that connects to I-25 at Exit #2. Written permission to use these last two routes in an emergency is needed.

At least two other unimproved exit routes exist. They are the primitive road that originates on lot G18 and goes under the railroad to the I-25 frontage road and on to exit #2 and the old jeep road that originates on lot C15 that goes downhill to Sarauche Canyon. Both of these alignments need significant improvement to serve as evacuation routes. Improvements to these two options will need to be negotiated with the involved landowners.

See section III for a few additional thoughts to facilitate timely evacuation in a wildfire setting.

Local Preparedness and Protection Capability

Fisher's Peak Fire Protection District (FPFPD), Volunteer Fire Department has a cadre of about 35 firefighters and three dispatchers with the majority capable of building fireline with hand tools for an extended period of time. Station 3 is located on SFTR. Six firefighters and three dispatchers live on the SFTR and can respond quickly to mobilize in the case of a wildfire.

Equipment located at Fire Station Three Includes:

- 1977 Dodge Power Wagon Type 6 engine with 250 gallons of water and foam capability. The truck also has the normal compliment of hand tools and a chain saw.
- 1979 Ford Pumper with 500 gallons of water, portable water tanks, Floto-pump and a few wildland tools is used as their interface truck.
- Military surplus 6x6 tender with 900 gallon tank is coming soon.
- 1980 Class A Pumper is also currently being developed.

Station 1 and 2 of Fishers Peak Fire Protection District are the first back up for Station 3. Staged at these stations are the following:

- 1986 Ford Pumper with 700 gallons of water
- 2002 Ford Fast attack with 400 gallons of water and Wildland tools
- 1985 GMC Brush Truck with 200 gallons of water and Wildland tools

- CSFS Tender with 1500 gallons of water

This compliment is at best twenty minutes from the SFTR entrance and as much as thirty minutes to the scene depending on the location on the Ranch.

Additional reinforcements from FPPFD and additional equipment and manpower from nearby departments (Hoehne, Stonewall, Cokedale, Spanish Peaks and Trinidad) that have mutual aid agreements with FPPFD are at least an hour out with availability dependent upon workload at the time of the request."

Water Supply: The SFTR Metro District gets its water from the City of Trinidad and pumps it to the community. Some residents currently have their own wells or haul water instead of paying the tap fees for the community water system. Each developed lot is expected to have at least 1,500 gallons of water storage on site for fire protection. Most of these tanks are underground. Some of the residents now hooked to the Metro District water system are currently by-passing their cisterns and should be encouraged to keep them full and available during fire season. The ranch Metro District water system contains three 110,000 gallon tanks and several pump stations. There are also sixty four, two inch hydrants distributed around the Ranch. Many of these hydrants are located at the end of dead end roads.

Water pressure at the hydrants varies from 10 to 60 pounds per square inch, depending upon elevation of the hydrant relative to that of the storage tank or pressure relief valve. Water flow at the hydrants will range from 380 to 920 gallons per hour depending on water pressure at the hydrant. Hydrant and major storage tank locations are shown on the Fire Control Features Map.

There are also several perennial ponds on the Ranch that are adjacent to roads and can be counted on for wildfire suppression purposes.

Grazing: SFTR is a working ranch with a cattle grazing lease. The grazing cattle help to keep the grasses and other fine fuels from accumulating in the open areas of the ranch. Without the cattle to keep these fine fuels under control a significant effort will be required to periodically keep the grasses and other fine fuels mowed throughout the growing season.

III. COMMUNITY MITIGATION PLAN

Defensible Space:

Effective defensible space is the landowners' most reliable means of providing wildfire protection for their structures. This is especially true on the Santa Fe Trail Ranch. Complex terrain, heavy fuels, and landownership patterns on the Ranch make landscape level fuel modification very difficult. This plan suggests a few shaded fuelbreaks along strategic ridges and roads but **the key to individual structure survival is Defensible Space and good "Fire Wise" practices.**

During periods of high to extreme fire danger a wildfire will rapidly exceed the suppression capability of the local fire suppression forces. Table 2: Santa Fe Ranch Fire Behavior Prediction displays the difficult position firefighters will face on a dry, windy day. Hand crews are effective when flame lengths are less than four feet. On a bad day only ten percent of the Ranch is expected to have fire of this intensity. The rest of the area will experience flame lengths from nine to thirty five feet. The size of a fire within the first hour is also expected to grow beyond local initial attack capability over ninety percent (90%) of the ranch.

Homeowners should not expect much protection intervention if/when a large fire burns on or through the Ranch. The harsh realities of triage and coordinating attack with mutual aid forces will consume local fire forces for several hours. **Fire Wise rated defensible space is the key to structures surviving on their own.** Do it now and keep it maintained.

In many cases sizeable effort has been spent developing defensible space around quality homes perched on the edge of a steep slope with heavy vegetation below the structure. Unfortunately the trajectory of the flames will intersect the structure, exposing it to direct contact with the fire. During site visits for triage, several landowners acknowledged the paradox they have created with the location of their home.

The POA will encourage people to set new homes back from the edge of steep, brushy slopes using the guidelines provided in "Creating Wildfire Defensible Space Zones, Circular #6.302 (Dennis, 2003)

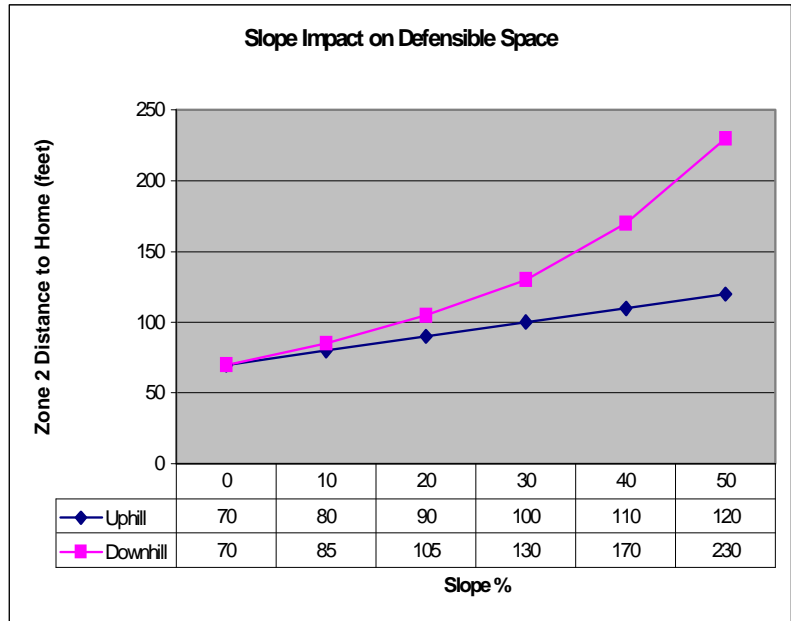


Chart 3: Slope Impact on Defensible Space

Education and Information:

The SFTR Forest Health/Wildfire Mitigation Committee (FH/WM) was formed in 2004. The Mission of the Committee is to actively promote mitigation of fire hazards and advance ecologically sound forest management practices by heightening awareness, fostering education, and mobilizing property owners to support goals and objectives which will promote a safer and healthier forest environment.

The committee has provided the following educational events since committee formation: Panel Discussion presented by members of the Culebra Range Community Coalition, FireWise Training presented by Colorado State Forest Service/ Colorado State University, Tour of the Bosque de Oso provided by the Department of Wildlife, and the SFTR FireWise Tour event jointly presented by CSFS/CSU and FPPD. Further Education Events of this type are planned to increase property owner awareness of FireWise Practices.

In December 2005 through January 2006 the committee facilitated and coordinated 251 hours of Hydro-Axing on the Santa Fe Trail Ranch with Open Range Land LLC. Thirty-two property owners were able to take advantage of this opportunity, with much of the work being done to improve defensible space around structures.

The committee has also established a website at <http://www.sftrforest.org/> to provide timely educational materials and news about the efforts of the committee.

Fuel Hazard Reduction:

Vermejo Park Ranch has been working cooperatively with the Colorado State Forest Service, Fisher's Peak Fire Protection District, and the Santa Fe Trail Ranch to develop a shaded fuelbreak along the south and west boundaries of SFTR. Approximately one and a half miles of boundary now have shaded fuel breaks with more planned as funding becomes available.



This photo shows the fence-line contrast along the boundary between SFTR and Vermejo Park Ranch on the south west corner of the Ranch. Vermejo Park Ranch has recently completed this shaded fuelbreak along the boundary.

Many roads on SFTR run along ridges and provide marginal opportunities to make a stand against an aggressive fast moving fire. Their utility as fire control features can be improved substantially by thinning both sides of the road. Road rights of ways (ROW) extend thirty (30) feet each side of the center line. A sixty (60) foot wide break is a start towards an adequate break in fuel continuity but is not sufficient to provide the kind of safety needed in the heavy fuels found on the Ranch. Thinning to get a three hundred (300) foot wide break will require negotiations with many landowners. It is critical that the fuelbreaks be continuous. Without wide spread individual landowner cooperation, creating effective fuelbreaks is not feasible.

Table 4: Santa Fe Trail Ranch Potential Shaded Fuelbreaks and the Recommended Fuel Treatment Map provide the detail for the recommended fuel treatments.

This is an extremely ambitious shaded fuelbreak program and will be complex to negotiate across the multitude of ownerships involved. With the exception of the Gallinas Parkway Corridor, it improves fire control opportunities along strategic ridges and begins to break up the hazardous fuel continuity on the Ranch. Gallinas Parkway is located in a draw formed by Gallinas Creek. Valley bottoms are not as effective as ridges for large wildfire control. It is, however, the only large tract of open space on the SFTR not encumbered by multiple ownerships

Table 4: Santa Fe Trail Ranch Potential Shaded Fuelbreaks

Fuelbreak Name	Length (miles)	Acres	Estimated cost (\$)	Priority
Gallinas Parkway Green lands Corridor	4.0	162	32,400	1
Owen Baldwin Parkway	6.3	227	136,000	2
Squirrel, Timber Park, Alpine Meadows	4.3	155	93,000	3
Chipmunk, Turkey Creek	2.3	83	50,000	4
Big Springs, Old Mission Ridge	2.9	104	63,000	5
Tin Cup Trace, Alpine Meadows	2.0	72	44,000	6
Timber Ridge	1.0	36	22,000	7
Elk Park, Oak Park, Ponderosa Ridge	2.4	86	52,000	8
Tall Timber Trace	1.0	36	22,000	9
Total	26.2	961	514,400	-

An alternative would be to work within the sixty (60) foot total right of way along the roads. The entire eighty three (83) miles of road in the Ranch could be thinned within the ROW for approximately \$250,000. This will provide a good place for fire personnel to burn out or backfire as needed, but this approach does not afford much protection during more volatile fire conditions.

Fuelbreak Maintenance: Gambel oak and New Mexican locust are abundant understory species on the Ranch. They also sprout vigorously after they are cut. Keeping them under control following thinning will be a task. Two methods are effective to keep them in check. Mowing is effective but has to be done on an annual basis. Herbicide treatment is also effective but may be objectionable to some landowners. See Appendix E: Defensible Space Maintenance & Gambel Oak for a further discussion on herbicide control of Gambel oak.

It will be wise to have a maintenance option in mind prior to fuelbreak construction.

Treatment Costs: Treatment costs for defensible space and shaded fuelbreak work are highly variable depending on the amount of thinning and slash disposal to be done and the relative care involved in doing the work. Hand crews working next to structures and chipping the slash will cost from \$1,000 to \$2,000 per acre. Mechanical thinning with a hydro-ax type machine will normally cost from \$400 to \$700 per acre depending on tree density, slope and rockiness.

Wildfire Suppression Infrastructure:

Turnarounds: Space is lacking, to turn around fire equipment, at the end of most dead end roads. In fact in most cases the terminus is even tight for a full sized

pickup truck. Hydrants are often located right at the end of the road and fire trucks will be shuttling water from these locations.

Accommodations for turning vehicles around near the end of the road are critical for fire suppression purposes. In some cases there is little room to construct turnarounds at the end of the roads so locating a turnaround as near the end as possible is the only option.

Fire Control Features/Triage Maps: The maps developed for this Community Wildfire Protection Plan provide invaluable information for wildland fire fighting. While the firefighters from Station 3 may know the Ranch like the back of their hand, reinforcements and mutual aid folks will struggle with the road layout and fire suppression opportunities. Communications can be enhanced by providing high quality maps that show important features.

SFTR POA Emergency Services Committee will provide a set of laminated maps and orthophotos to dispatchers, first responders, the Sheriff's department and Colorado State Forest Service. They will also have a few reserved to distribute during the inevitable emergency.

The three 110,000 gallon water tanks on the ranch do not have high volume gate valves on them to expedite filling fire apparatus. The two inch hydrants at the tanks do not serve the purpose as well as a larger valve located on the tank. Each tank has an inspection port that can be tapped and fitted with a large gate valve to fill fire equipment. Threads on the valve should be compatible with threads on the fire trucks in the vicinity. **THIS SHOULD BE DONE SOON.**

Uniform Street Addresses: Universal, visible, street addresses are absolutely imperative for first responder effectiveness. Las Animas County should be the single entity assigning addresses. The POA will facilitate implementation of a standardized approach to addressing driveways.

Utilizing Pond Water for Wildfires: Several ponds on the Ranch are adjacent to good roads. Getting fire equipment close enough to draft and fill the tanks may be problematic due to elevation and drafting capability of individual pieces of equipment. The most reliable method to fill tanks is with mechanical high volume or high pressure pumps. The most flexible system to transfer pond water to fire trucks is the "Floto-Pump". This light weight pump can be carried by one person and is simple to operate. You merely connect a hose to the pump, place it in the pond and start it. The pump floats on the pond and primes itself. The pump can also be placed in a large folding tank to provide high pressure water while an engine shuttles water from the closest hydrant. The addition of dry hydrants can facilitate the use of the ponds for firefighting, especially in winter months when ice on the ponds may make their use with Floto-pumps difficult.

Evacuation Planning: The SFTR Emergency Services Handbook contains a comprehensive Evacuation Plan that needs little embellishment. One factor to consider and perhaps address directly in the Evacuation Plan is the amount of time it will take to implement fully in comparison to the expected fire behavior described in Table 2: Santa Fe Ranch Fire Behavior Prediction. Fire spread rates of two to almost three miles per hour and spotting distances of close to a half a mile mean that evacuations should probably be implemented when any fire is moving toward the ranch and is within six or seven miles of the Ranch.

Just making sure everyone is notified will be a daunting task given the eighty three (83) miles of road and one hundred and forty five (145) structures scattered throughout the nearly 17,000 acre SFTR. This situation can be further complicated with off-site property owners visiting their land.

Currently SFTR is divided into six emergency areas with a Team Leader assigned to each area. Some areas are quite large with several potential evacuation routes. With an increasing number of residents and changing distribution of population on the ranch it may be prudent to re-evaluate the designation of the emergency areas keeping in mind the common evacuation routes for each area. Another factor to consider is the formalization of back-up plans when key individuals in the area calling trees are unavailable.

An evacuation simulation exercise would be an eye-opener for Ranch residents and should be scheduled for next spring. This test run will give everyone involved a better sense of the task at hand.



The locked gate at the old Morley mine and locked gate at the south end of Owen Baldwin Parkway, installed by Vermejo Park Ranch to expedite ingress & egress for both Vermejo & Santa Fe Trail Ranches in case of emergency should be included in the simulation. Property owners need to become familiar with all of the emergency exits.

This photo shows the gate at the south end off Owens Baldwin Parkway.

Strategic Recommendations:

The Santa Fe Trail Ranch Forest Health/Wildfire Mitigation Committee is composed entirely of volunteers who are dedicated but over committed and there is no full time focus in pre-planning, hazard detection, follow up, communications, coordination, and/or implementation of improvements. The community does not have a mechanism for administering multiple demands, SFTR CWPP

setting priorities, and insuring representation that benefits the community as a whole.

In order to strengthen the ability for SFTR to implement the Community Wildfire Protection Plan we shall seek funds to employ a coordinator or project manager to ensure implementation of the Plan, including the required overall leadership, management, and activity coordination. In addition the position would be responsible for such items as overseeing management of defensible spaces in the community and generation of grants for the implementation of the Community Wildfire Protection Plan with the Colorado State Forest Service.

Table 5: Implementation Items Priority & Cost

Mitigation Action	Priority	estimated Cost (\$s)
Implement Universal Street Addressing System	1	1,500
Defensible Space Around All Structures (\$5,000/lot)	2	355,000
Laminated Triage Maps (20 sets)	3	1,080
Gallinas Parkway Green lands Corridor	4	32,400
Install high volume gate valves on all three water tanks	5	1,500
Waterous Floto Pumps and/or dry hydrants to access pond water	6	6,800
Negotiate and document rights to use pond and Metro water for firefighting and alternate evacuation routes	7	1,000
Evacuation Plan Revision	8	1,000
Evacuation Simulation	9	1,000
Prioritize & Construct Turnarounds on Dead End Roads (~50)	10	250,000
Owen Baldwin Parkway	11	136,000
Fuel Break Maintenance	12	Variable
Squirrel, Timber Park, Alpine Meadows	13	93,000
Chipmunk, Turkey Creek	14	50,000
Big Springs, Old Mission Ridge	15	63,000
Tin Cup Trace, Alpine Meadows	16	44,000
Timber Ridge	17	22,000
Elk Park, Oak Park, Ponderosa Ridge	18	52,000
Tall Timber Trace	19	22,000
Total		\$1,133,280

IV. IMPLEMENTATION & MONITORING

Implementation: Table 5: Implementation Items Priority & Cost lists all the mitigation actions/projects identified in this CWPP. There are also an estimated seventy one (71) homes that need to have their defensible space improved so that they are defensible.

Table 6: Action Plan for Completing the Santa Fe Trail Ranch CWPP, identifies the responsibilities and tasks necessary to accomplish the job at hand. The priorities and responsibilities have been negotiated and agreed to by the POA and the various named individuals.

Monitoring: Plans do not complete themselves. Monitoring progress is a crucial part of seeing any plan through to completion. Given the values at risk at SFTR it will be important to take a pulse on accomplishments on an annual basis. We expect more homes to become defensible and maps will have to be revised to reflect the work that has been accomplished. The POA will revisit the CWPP and associated accomplishments each fall and will get new maps printed as accomplishments warrant.

- Through the Colorado State Forest Service seek funds for the purpose of hiring and possibly cost- sharing a coordinator (implementation manager) who, among other things, would do the following:
 - Provide the leadership needed to implement this plan.
 - Establish a prevention attitude in the community for wildfire.

Strengthen public understanding, acceptance and participation in FPPFD operations and improvement projects.

Insure follow up to commitments by the community or within the community and on behalf of the FPPFD goals.

Facilitate the organization of an ongoing cooperative management team consisting of members from the SFTR POA Board of Director, FPPFD Board of directors and Las Animas County officials. This group will act as an advisory board to represent the community as a whole. This entity would do the following:

- Set priorities, develop and administer fund raising activities, interact with and coordinate with County, coordinate with State and Federal agencies on behalf of the community as a whole, and insure follow up on all operations and or activities.

Table 6: Action Plan for Completing the Santa Fe Trail Ranch CWPP

Mitigation Action	Target Date	Assigned to	Completed ✓
Implement Universal Street Addressing System	8/1/2006	POA Addressing Committee	
Defensible Space Around All Structures (\$5,000/lot)	Ongoing w/ 80% complete by 2010	FH/WMC	
Laminated Triage Maps (20 sets)	7/1/2006	Dave Skogberg	
Gallinas Parkway Green lands Corridor	9/2007	FH/WMC	
Install high volume gate valves on all three water tanks	5/1/2006	POA Metro	
Waterous Floto Pumps and/or dry hydrants to access pond water	9/1/2007	POA & FPPFD	
Negotiate and document rights to use pond and Metro water for firefighting and evacuation routes	5/1/2006	POA	
Evacuation Plan Revision	4/15/2006	Emergency Services Committee	
Evacuation Simulation	6/1/2006	Emergency Services Committee	
Prioritize & Constructing Turnarounds on Dead End Roads (~50)	2010	Road Sub-Committee	
Owen Baldwin Parkway FB	7/1/2009	FH/WMC	
Fuel Break Maintenance	Ongoing	FH/WMC	
Squirrel, Timber Park, Alpine Meadows FB	7/1/2010	FH/WMC	
Chipmunk, Turkey Creek FB	7/1/2011	FH/WMC	
Big Springs, Old Mission Ridge FB	7/1/2012	FH/WMC	
Tin Cup Trace, Alpine Meadows FB	7/1/2013	FH/WMC	
Timber Ridge FB	7/1/2014	FH/WMC	
Elk Park, Oak Park, Ponderosa Ridge FB	7/1/2015	FH/WMC	
Tall Timber Trace FB	7/1/2016	FH/WMC	

FH/WM = Forest Health/Wildfire Mitigation Committee

LOT	ROAD	ADDRESS	LENGTH-FT	WIDTH-FT	GRADE	TURNROUND	STRUC_NORTH	STRUCT_EAST	DRIVEWAY_EAST	DRIVEWAY_NORTH	STRUC_RATE	D_SPACE	FM	FLAME_LGTH	ESCAPE_RT	SAFETY_ZON	DEFENDABLE	PHOTO	NOTES
E8	Fawn Court	0	100	14	0	NO	37.01015	-104.54576	-104.54575	37.00993	GOOD	POOR	9	4	YES	NO	NO		
F1	Aspen Circle	35432	2640	10	5	YES	36.99721	-104.53046	-104.53027	37.00103	GOOD	FAIR	9,6	10	YES	NO	NO		Brush on steep slope below structure
F11	Tin Cup Trace	0	500	10	5	NO	37.00236	-104.52930	-104.52914	37.00141	GOOD	FAIR	9,6	10	YES	NO	YES		
F12	Tin Cup Trace	0	50	16	0	NO	37.00233	-104.52540	-104.52540	37.00208	GOOD	GOOD	9,6	10	YES	NO	YES		
F13	Juniper Overlook	0	50	10	0	NO	37.00461	-104.52212	-104.52228	37.00433	FAIR	GOOD	9	4	YES	NO	YES		Move miscellaenous wood away from bldg
F16	Tin Cup Trace	0	100	14	0	YES	37.01199	-104.51890	-104.51931	37.01227	FAIR	FAIR	9,6	10	YES	NO	NO		Steep slope below house
F18	Timber Park Drive	35050	500	12	7	YES	37.00759	-104.52640	-104.52806	37.00777	GOOD	GOOD	9,8	4	YES	NO	YES		Good DS
F22	Tin Cup Trace	128	450	12	10	NO	37.01582	-104.51372	-104.51350	37.01551	GOOD	FAIR	9,6	10	YES	NO	YES		Steep initial pitch drive w narrow drive to house
F24	Lodgepole Trace	36315	800	14	15	NO	37.01018	-104.51414	-104.51066	37.01015	FAIR	POOR	9,6	10	NO	NO	NO		Pond near house
F26	Lodgepole Trace	120	300	10	0	YES	37.00905	-104.51184	-104.51236	37.00903	GOOD	POOR	6	11	YES	NO	NO		Sits on top of very steep hill hvy fuel below
F28	Lodgepole Trace	90	100	10	0	YES	37.00695	-104.51312	-104.51344	37.00692	GOOD	POOR	6	11	YES	NO	NO		1,200 gallon water storage
F33	Alpine Meadows Drive	0	530	12	5	NO	36.99694	-104.50638	-104.50627	36.99512	POOR	POOR	9,6	10	YES	NO	NO		Collapsed log structure not worth protecting
F33	Aspen Circle	0	100	10	0	YES	36.99486	-104.52385	-104.52377	36.99534	GOOD	GOOD	9,6	10	YES	NO	YES		Metal barn
F44	Alpine Meadows Drive	0	530	10	0	NO	37.01302	-104.49681	-104.49654	37.01449	GOOD	GOOD	1,9	8	YES	YES	YES		
G1	Old Mission Ridge	2419	520	14	20	NO	37.02696	-104.51797	-104.51972	37.02740	FAIR	FAIR	8,6	9	YES	NO	YES		Steep driveway
G11	Alpine Meadows Drive	0	300	10	15	YES	37.01869	-104.50986	-104.50897	37.01819	GOOD	POOR	9,6	10	YES	NO	NO	Y	Collapsed metal shed & second driveway
G14	Alpine Meadows Drive	0	450	10	0	NO	37.01984	-104.50313	-104.50330	37.01949	POOR	POOR	9	4	YES	NO	NO		Log structure with combustables under deck
G17	Alpine Meadows Drive	0	350	8	20	NO	37.02145	-104.50062	-104.50124	37.02077	POOR	POOR	9	4	NO	NO	UC/NT		Under construction wood under deck
G19	Alpine Meadows Drive	0	530	12	0	YES	37.01913	-104.50178	-104.50199	37.02047	POOR	POOR	9	4	YES	NO	NO		Structure on pilings with wood underneath
G21	Alpine Meadows Drive	35630	300	12	5	NO	37.01731	-104.50594	-104.50588	37.01722	?	FAIR	9	4	YES	NO	NO		New home under construction
G3	Old Mission Ridge	36444	300	10	5	NO	37.03218	-104.51646	-104.51703	37.03153	POOR	POOR	8,6	9	YES	NO	NO		
G4	Old Mission Ridge	0	200	10	5	NO	37.03300	-104.51352	-104.51369	37.03336	FAIR	FAIR	9	4	YES	NO	NO		
G7	Tin Cup Trace	0	600	12	0	YES	37.02573	-104.50854	-104.50774	37.02447	GOOD	GOOD	6,9	9	YES	NO	YES		Brush on steep slope below structure
G8	Tin Cup Trace	0	300	12	10	YES	37.02467	-104.50867	-104.50774	37.02447	GOOD	GOOD	6,9	9	YES	NO	YES		Brush on steep slope below structure
H14	Squirrel Lane	0	50	12	10	YES	36.99537	-104.56642	-104.56635	36.99500	GOOD	FAIR	9,6	10	YES	NO	NO		Heavy fuels on steep slope below structure
H16	Squirrel Lane	0	300	10	10	YES	36.99558	-104.57267	-104.57259	36.99699	GOOD	GOOD	1,9	8	YES	NO	YES		Abundant defensible space around structures
H8	Owen Baldwin Parkway	0	300	12	20	YES	37.00502	-104.57761	-104.57839	37.00584	FAIR	FAIR	9,6	10	YES	NO	NO		Brushy steep slope below house
H9	Owen Baldwin Parkway	0	150	12	5	NO	37.00695	-104.57404	-104.57437	37.00711	FAIR	FAIR	9,6	10	YES	NO	YES		Goat Ranch
J2	Fisher Peak Parkway	0	100	20	2	YES	37.08841	-104.52429	-104.52485	37.08771	GOOD	GOOD	6	0	YES	YES	YES		J2 outside subdivision map but was later incorporated, J1 no access
J4	Fisher Peak Parkway	0	150	16	0	NO	37.03912	-104.51283	-104.51274	37.03865	GOOD	FAIR	6	11	YES	NO	YES		Brush on steep slope below structure

Appendix E: Defensible Space Maintenance & Gambel Oak

In general, residents in the Santa Fe Trails Ranch have made significant efforts to reduce fuels around their structures. They have and are continuing to thin trees, removing the lower limbs (ladder fuels) and attempting to clear the Gambel oak. The heavy woody material has been cut and stacked for firewood and the lighter material has been chipped and spread on the ground. While their efforts in reducing fuels provided by pinyon, juniper and ponderosa pine have produced a more defensible space around their homes, clearings in the Gambel oak are more troublesome. Residents we talked to complained about the aggressive sprouting that occurs after clearing the oak and the continual clearing process that is necessary to hold the oak brush in check.

Gambel oak is a native plant that is naturally associated with pinyon-juniper and ponderosa pine forests in southern Colorado. It is a deciduous shrub that is quite adaptable and easily finds a niche in the under story of these forest types as well as in relatively pure stands. It thrives on steep slopes as well as more moderate sites and on a variety of coarse and medium textured soils. Gambel oak grows in clumps that are interconnected by an extensive root system that is characterized by both shallow rhizomes and deep-feeding roots. These rhizomes send up numerous sprouts when the mature stems are removed or when injury occurs.

Eradication of Gambel oak is rare by any method and without complete kill prolific sprouting may occur from roots, rhizomes and basal stems. Treated areas usually assume a “thicket” like appearance several years after the initial work (1). Numerous chemicals and combinations of chemicals have been used with limited success to control Gambel oak. Mechanical treatment, such as cutting stems and burning, are common methods of removing oak brush but it usually results in aggressive sprouting. Biological control of sprouts with repeated browsing by goats has proven to be an effective means of near elimination of oak sprouts, however browsing by goats is not considered to be practical in all situations. Goats prefer Gambel oak leaves for forage and after several years of repeatedly defoliating the oak during the period before the oak leaves reach full growth most of the sprouts are killed (1).

On the Santa Fe Trail Ranch where Gambel oak has been cut and sprouting is occurring, the most likely treatment is one that repeatedly defoliates the oak during mid summer. The positive effect of this repeated defoliation has been demonstrated using herbicides (1), prescribed burning (2), and browsing by goats (1). Defoliation may be accomplished by:

- mowing or chopping sprouts during mid summer
- using goats to browse the leaves and young shoots during mid

- summer
- using an approved herbicide following instructions on the label kill or defoliate the sprouts during mid summer which coincides with the time when leaf growth is reaching maximum. Some herbicides are restricted and require an Applicator's License to use. It is suggested that the Las Animas County Weed Specialist be contacted for local advice and guidance prior to using a herbicide (719-846-4468).

New Mexico State University Cooperative Extension Service Circular 597 contains a lists of herbicides for controlling Gambel oak and other undesirable brush species (3). Table 1 contains an excerpt from Circular 597.

Table 1. Herbicides for controlling Gambel oak (5)

Trade name and product rate/acre	Herbicide common name and active ingredients	Spray volume per acre or individual plant	Time of application	Remarks
Spike 20P ¼ oz per 22 sq ft when treating clump or thicket. p	Tebuthiuron	Individual plant treatment. Anytime of year	Optimum is prior to rainy season	Distribute uniformly under canopy. Do not apply to frozen or snow covered ground
OR Spike 20P 3 ¾ to 7 ½ lbs. pellets	OR Tebuthiuron ¾ to 1 ½ lb.	Aerial broadcast	Anytime during the year. Optimum is prior to rainy season.	Distribute uniformly under canopy. Do not apply to frozen or snow covered ground
OR Velpar L 2-4 ml per 33 sq ft of canopy diameter	OR Hexazinone	Individual plant treatment. Anytime during year	Optimum is prior to growing season	Apply undiluted Velpar L to soil within 3 ft of stem base. Use exact delivery handgun applicator. Do not apply to frozen ground. Do not use on clay soil.
OR Arsenal 1 gal per 100 gal water	OR Imazapyr 2 lb per 100 gal water with 0.25% surfactant	Individual plant treatment or ground application	Anytime during growing season when growing conditions are good.	Spray to wet.

Bibliography

- (1) Engle, D.M., C.D. Bonham, and L.E. Bartel. 1983. Ecological characteristics and control of Gambel oak. J. Range Manage 36(3)
- (2) Harrington, M.E. 1989. Gambel oak root carbohydrates in roots of Gambel oak sprouts following herbicide treatment. J. Range Manage 42(6)
- (3) Duncan, K.W., K.C. McDaniel and M.J. Renz. 2005. Chemical

weed and brush control for New Mexico rangelands. New Mexico State University Cooperative Extension Service Circular 597. 18p.

APPENDIX F – Fuel Hazard Reduction Guidelines

MINIMUM TREE SPACING – RULE OF THUMB ***Strive to reduce crown density to 40% or less.***

Ponderosa Pine/Douglas Fir: Convert stem diameter from inches to feet and add 7 more feet.

Example: A Ponderosa Pine 8” in diameter at DBH will have a spacing of 8 feet plus 7 feet for a total of 15 feet to the next tree.

Tree spacing does not necessarily need to be even. In fact, the fuel treatment area will look more natural if the spacing varies and small clearings are intermingled with small groups of trees. The important focus should be on breaking up fuel continuity – both horizontally and vertically.

If trees are very tall in relationship to their diameters, implement the thinning work over a long enough time to allow the standing trees to develop their wind firmness and resistance to snow bend. Thinning when trees are small helps reduce prevent these vulnerabilities. Thinning in patches and designing the thinning to minimize wind effect can be done depending on location. All of these can be used but can best be accomplished with the assistance of an experienced forester.

An important part of fuel hazard reduction is removal of the ladder fuels; particularly when adequate thinning cannot be accomplished. Therefore, the following is important to do within a timber canopy.

- ✓ Prune trees to 6 or 10 feet above the ground, depending on slope, leaving at least 1/3 live tree crown
- ✓ Remove tree reproduction from under the canopies of remaining trees
- ✓ Remove sagebrush, oak or any other flammable brush from under the canopies of remaining trees. Reduce the size and height of remaining clumps of brush
- ✓ Remove all dead forest debris within defensible space and fuelbreak areas.
- ✓ Reduce concentrations of dead forest debris within other areas
- ✓ Remove trees recently killed by mountain pine beetle* or other disturbances within defensible space and fuelbreak areas.
- ✓ Reduce numbers of trees recently killed by mountain pine beetle* or other disturbances in other areas. Only 1 to 3 dead

trees per acre are needed for wildlife habitat purposes.

***Note:** *Proper slash disposal procedures should be implemented to avoid attracting Mountain Pine or other bark beetles to the project area.*

APPENDIX G – Evacuation Planning Guidelines

Background

The growth of urban development in forested wildland areas in recent years has resulted in a potentially hazardous situation. People are attracted to forested areas seeking solitude and to escape the pressures of everyday life. Large land holdings have been subdivided into small affordable acreages for cabin sites or remote homes. At the same time wildfires have been aggressively suppressed allowing young trees to establish in high densities and dead fuels to accumulate to alarming levels. These ladder fuels provide a “leg up” for a wildfire to burn into the crowns and move rapidly under windy conditions. The new generation of small lot landowners value individual trees and have built their cabins under the cover of these overstocked forests. Cabins are constructed on prominent points or ridge tops for the view or they are tucked into the forest canopy seeking solitude. In order to minimize the impact of their presence on the land driveways are often narrow with inadequate opportunities to turn around at the building site. Little attention has been paid to the potential destructive capacity of an uncontrolled wildfire.

In an emergency wildfire situation that threatens the lives and property of residents in the area, the Fisher’s Peak Fire Department, in consultation with the fire suppression team and Huerfano County Sheriffs department, has the responsibility and authority to evacuate residents to a safe area. Prior evacuation planning is essential to implement this action effectively.

By definition, evacuation is a protective action—moving people from a place of danger to a place of relative safety. As a phenomenon, it is a temporary mass movement of people that collectively emerges in coping with a threat to SFTR residents and visitors.

An Evacuation Plan will facilitate this orderly evacuation during an emergency wildfire situation that threatens residents and facilities. Step by step actions provide critical information and guidance for fire suppression, and law enforcement personnel during an emergency situation. Santa Fe Trail Ranch has an evacuation plan for their area that should be revised to identify potential evacuation routes and critical information (locked gates, inadequate bridges, etc) for a variety of wildfire threat scenarios.

Critical Contacts

County Sheriffs
County Fire Wardens
Colorado State Patrol
Colorado State Forest Service

xxx-xxx-xxxx

Interagency Fire Center/Fire Dispatch Center

Federal Emergency Management Agency
County Emergency Preparedness Director
Local News Media
Red Cross
Local Towing Service
Others_____

Check List When Potential For Evacuation Exists

- 1) Close back country roads and trails at the trail heads
- 2) Post on bulletin boards information regarding fire danger.
- 3) Set up a local Information Center where residents and visitors can access up to date information and status regarding wildfire that pose a threat to the area.
- 4) Provide routine updates on wildfire conditions for local radio and television stations as the threat increases.
- 5) When the fire suppression team and or Sheriffs Deputy believe evacuation may become necessary, notify the Huerfano County Sheriff and Fire Warden
- 6) Fire suppression team and Property Owners Association representative should meet with the Sheriff to decide if an evacuation is necessary. The decision to evacuate should be made and implemented well before the evacuation needs to be complete. Local conditions and the fire's rate of advance will dictate.
- 7) Sheriff in consultation with the POA makes the decision to evacuate the threatened area and implements the actual evacuation
- 8) Notify residents and visitors of the Order to Evacuate
 - Siren to alert visitors in the back country
 - Law enforcement patrol vehicles with public address systems announce evacuation order
 - House to house verification that threatened home site development is completely evacuated
 - Law enforcement vehicles and ATVs drive back country roads and trails to assure evacuation
 - Use one color flagging to mark secondary roads/trails at their junction with the primary road (evacuation route) when notification is in progress then change to another color when verification is complete on that road/trail.
- 9) Drive evacuation routes installing free standing traffic control signs at key road intersections and opening locked gates or cutting fences to allow exit.
- 10) Notify Federal Emergency Management Agency (FEMA)
- 11) Notify Colorado State Patrol
- 12) Assign law enforcement to direct traffic at critical road junctions

The officer in charge of the evacuation will make the decision regarding which evacuation route to use at the time. Depending on the situation the decision may be to use any or all of the routes to evacuate the threatened area.

Emergency Evacuation Routes

Primary emergency evacuation routes are suggested but should be validated with landowners and land managing agencies involved prior to the onset of an emergency need for evacuation. These primary evacuation routes should provide multiple opportunities for evacuating traffic to exit the area. Hazardous fuel concentrations should be treated along primary evacuation routes to reduce canopy cover to 40 percent or less and remove slash and combustible debris within 150 to 200 feet of the road. Tributary roads should be identified in local developments and treated similarly to facilitate a safe and orderly evacuation.

Estimated Time To Implement An Evacuation

The decision to evacuate a threatened area must be made well in advance of the time the fire is expected to threaten residents, visitors and facilities.

Fire Behavior and Evacuation Timing

Rate of Spread (ROS) is the key fire danger component to monitor. The ROS is a numerical value derived from a mathematical model that integrates the effects of wind and slope with fuel bed and fuel particle properties to compute the forward rate of spread at the head of the fire. Output is in units of feet per minute. A ROS of 31 indicates a worst-case, forward rate of spread of approximately 31 feet per minute.

The inputs required in to calculate the ROS are wind, slope, fine fuel moisture (including the effects of green herbaceous plants), and the moisture content of the foliage and twigs of living, woody plants.

Since characteristics through which the fire is burning are so basic in determining the forward rate of spread of the fire front, a unique ROS table is required for each fuel type.

When considering spotting, the rich diversity of fuel types scattered throughout the County, and the likelihood of wind, it may be prudent, when fire danger is Very High, to start an evacuation process when wind brings a fire to within 6-7 miles of the Ranch or home site development area (urban interface area).

Knowing the ROS for the most prevalent fuel type between where the fire is and where the home site developments are can, best refine this judgment call.

Spread Component (SC) is one of the National Fire Danger Rating System fire behavior outputs. It can be found in the daily Remote Automated Weather Station printouts. The Spread Component provides the fires forward rate of spread in feet per minute. With a SC of 44 a fire will cover 2 miles or more within 4 hours. If the SC is 22 the fire will cover at least one mile within 4 hours and 2 miles within 8 hours. If the SC is 11 the fire will cover two miles within 16 hours.

If the SC is 5 the fire can cover two miles within 32 hours.

Timing

Evacuation planning needs to take into account how long it will take to notify residents that an evacuation is necessary, how long it will take for them to get ready and start driving out of the area and then how long it takes to actually drive to a safe area. This determination should be made locally then validated before it is used during an emergency.

Every situation will be different but it is reasonable to estimate the minimum time required to be no less than 4 hours to complete the process. As much as three hours may be required to notify residents and visitors and get them started moving and another hour to get everyone out of the area. Residents and visitors closest to the advancing threat should be notified first. Once they are driving out of the area it will take them up to an half hour in most cases to exit the area if traffic is flowing at a rate of 10 to 20 miles per hour.

Driving time should be measured on each of the potential evacuation routes by driving at a conservative speed depending on road conditions and how many people are expected to be evacuated to approximate how long it would take to drive the route during an evacuation providing traffic was moving at about that rate. The following table displays the type of information that needs to be incorporated in the Evacuation Plan.

Travel Time for Evacuation Routes

Beginning Point	Ending Point	Time Required	Miles Traveled	Average Speed

This table provides GPS coordinate locations for critical points referred to.

GPS Locations for Critical Features and Facilities

Feature	GPS Location

Recommendations

- Negotiate agreements with neighboring private land owners to allow evacuation across their property on their roads and through their locked gates.

- Negotiate an agreement to thin fuels along the evacuation route between the subdivision or home development area and safe areas.
- Upgrade roads on evacuation routes by widening curves, providing water bars to prevent erosion and thinning fuels along these emergency exits.
- Construct and store freestanding “Fire Exit Directional Signs” or “Evacuation Route” for use in marking evacuation routes.
- Develop a specific evacuation procedure and assign responsibilities to County staff and POA members.

Appendix H

STRUCTURE TRIAGE

Triage is the determination of priorities for action during an emergency. This describes a concise decision making process that will be used if/when a wildfire threatens multiple structures simultaneously. It will be done rapidly and on the move. *This is a thought process that does not require completion of any paperwork.*

Structure:

Roof Type?

Debris on Roof?

Propane Tank?

Siding?

Fire Brand Traps?

Flammable Clutter?

Defensible Space:

Is There Any?

Water Supply?

Adjacent Fuel Type ?

Access/Turnaround?

Current & Expected Fire Behavior?

Available Firefighting Resources?

Firefighter Safety:

Escape Routes?

Safety Zones?

Quickly determine the status of each threatened structure and make decisions!

Clearly communicate the priorities and firefighter evacuation criteria!

Be ready to live with your decisions, they will be second guessed after the threat is over.

Your first priority is to live to fight fire another day!!

Initial Attack - An aggressive suppression action consistent with firefighter and public safety and values to be protected.

Insurance Services Office (ISO) Rating - An overall fire services rating developed for use in determining insurance premiums for residential and commercial property. Factors such as fire alarm systems, equipment, training, availability of water (hydrants), etc. are used to develop the rating. The rating is on a scale of class 1 to class 10, with 1 providing the best public protection and 10 providing the lowest public protection. See www.iso.com for more details.

Mitigation Actions - Those on-the-ground activities that will serve to increase the defensibility of an area; check, direct, or delay the spread of fire, and minimize threats to life, property, and resources. Mitigation actions may include mechanical and physical non-fire tasks, specific fire applications, and limited suppression actions. These actions will be used to construct fire lines, reduce excessive fuel concentrations, reduce vertical fuel, and create black lines.

Preparedness - Activities that lead to a safe, efficient, and cost-effective fire management program in support of land and owners management objectives through appropriate planning and coordination.

Rate Of Spread (ROS)- The forward rate that a fire will progress across a landscape usually expressed in chains (66ft) per hour. ROS has been converted to miles per hour in this report to be more meaningful to the intended audience.

Resistance to Control (ROS)- A means of describing how difficult it is to build and hold fireline in a particular area. It is a relatively subjective term based on fireline production rates, slope and fuel density. Usually described as high, moderate, or low.

Spotting- One method by which wildfires spread by means of airborne embers landing in receptive fuel beds. Spot fires can travel unusual distances and often compromise firelines during periods of high fire danger.

Triage- A process of quickly setting priorities for action in emergency situations. It is particularly valuable when multiple structures are threatened and fire fighting resources are limited.

TSI - Stands for "Timber Stand Improvement" thinning to stimulate growth and improve residual tree health

Wildfire - An unwanted wildland fire.

APPENDIX I – Definition of Terms

Community Wildfire Protection Plan- (CWPP) The Healthy Forest Restoration Act of 2003 establishes CWPPs as the means for communities in the wildland-urban interface to address their wildfire hazard concerns and decide how they wish to deal with them. CWPPs provide a common footing for setting priorities for the expenditure of local, state and federal funding. They are developed in a collaborative environment with all interested parties involved.

Crown Closure- An expression of how dense a forest is based on the amount of surface area covered by the crowns of trees. It is useful in many forest applications including wildfire hazard assessments. Research has shown the crown closure of forty percent or less are unlikely to support independent crown fires.

Defendability- A judgment of the likelihood that firefighters can safely protect a structure during the passing of an intense wildfire front. It is based on structure construction, expected fire behavior in the structure vicinity, open space for firefighters to operate in, escape routes, and availability of space to turn fire engines around.

Defensible Space- Area around a structure where fuels and vegetation are treated, cleared or reduced to slow the spread of wildfire towards the structure. It also reduces the chance of a structure fire moving from the building to surrounding forest. Defensible space provides room for firefighters to do their jobs.

Flame Length- The distance from the ground to the tip of a flame is an indication of fire intensity. Fires with flame lengths less than four feet are normally thought to be controllable with hand crews. Fires with flame lengths more than four feet are usually much more difficult to control and require heavy equipment to make much progress in suppression.

Fuelbreak- A linear zone of modified fuel conditions designed to reduce wildfire intensity that provides a safe place for firefighters to make a stand. They are most likely to be located on ridgelines. This zone has had the ground fuels cleaned up and the crown cover reduced to around forty percent.

Fuel Ladder- Is the fuel that creates a continuous path from the ground in to the crowns of trees or large shrubs. The more abundant fuel ladders are the more prone a forest is to crown fire. When the limbs of the overstory trees and the understory vegetation intermix there is a continuous fuel ladder.

Fuel Model- A means of describing various woody fuel arrangements in terms of fuel size, bulk density, fuel bed depth and tons per acre. The models are used in fire behavior prediction software.

Fuel Moisture- The amount of water in fuel per oven dry weight usually expressed in percent.

Fuel Treatment - Project to reduce or change fuel loading or type on a site. Can be accomplished by mechanical, manual, chemical, or fire use.

Appendix J: References

Anderson, Hal E. 1982. Aids to determining Fuel Models for Estimating Fire Behavior. USDA Forest Service. General Technical Report INT-122, 22 p. Intermountain Forest and Range Experiment Station, Utah, 84401.

Andrews, Patricia; Bevins, Collin; and Seli, Robert. 2003. BehavePlus fire modeling system User's Guide. USDA Forest Service. General Technical Report RMRS-GTR-106WWW. Rocky Mountain Research Station.

Dennis F.C. 1999. Fire Resistant Landscaping. No. 6.303 Natural Resource Series. Colorado State University Cooperative Extension.

Dennis F.C. 1999. Forest Home Fire Safety. No 6.304 Natural Resource Series. Colorado State University Cooperative Extension.

Dennis F.C. 2002. FireWise Plant Materials. No 6.305 Natural Resource Series. Colorado State University Cooperative Extension.

Dennis F.C. 2003. Creating Wildfire-Defensible Zones. No 6.302 Natural Resource Series. Colorado State University Cooperative Extension.

Dennis F.C. 2005. Fuelbreak Guidelines for Forested Subdivisions & Communities. Colorado State Forest Service

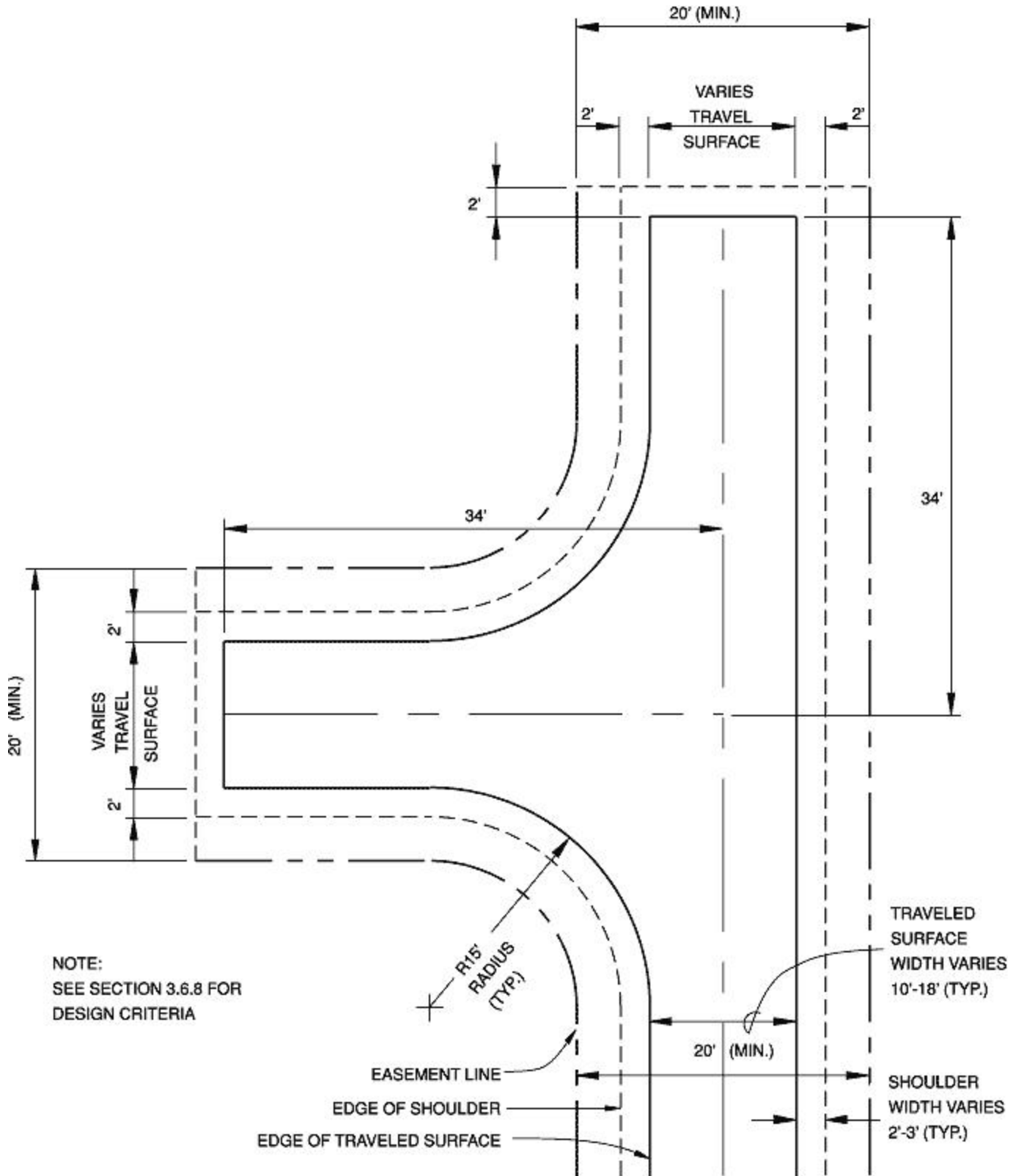
Emergency Services Committee. 2003. Santa Fe Trail Ranch Emergency Services Handbook. Santa Fe Trail Ranch Property Owners Association.

Graham, Russell. 2003. Editor. Hayman Fire Case Study: Summary. USDA Forest Service. General Technical Report RMRS-GTR-115. Rocky Mountain Research Station.

Helms, John. 1998. The Dictionary of Forestry. Society of American Foresters.

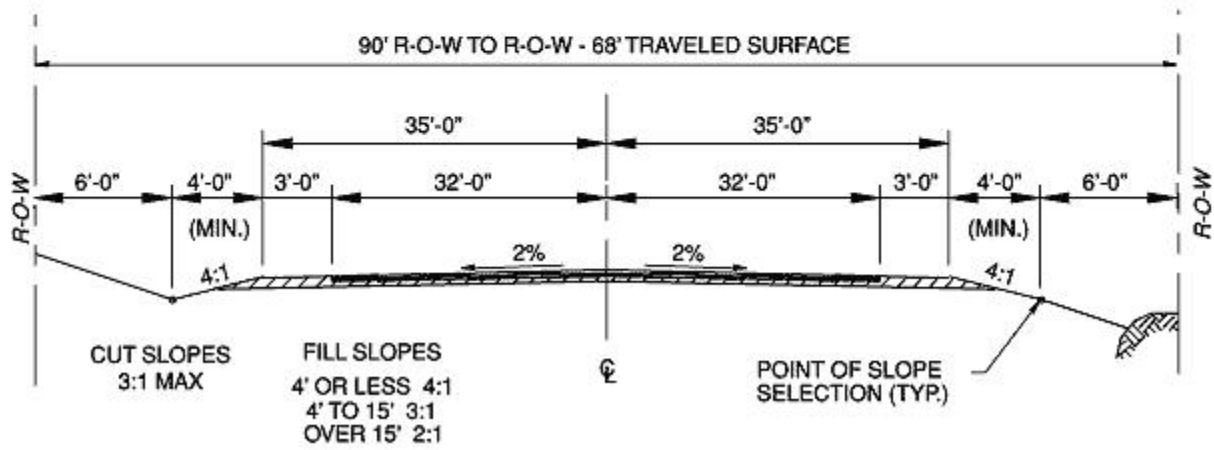
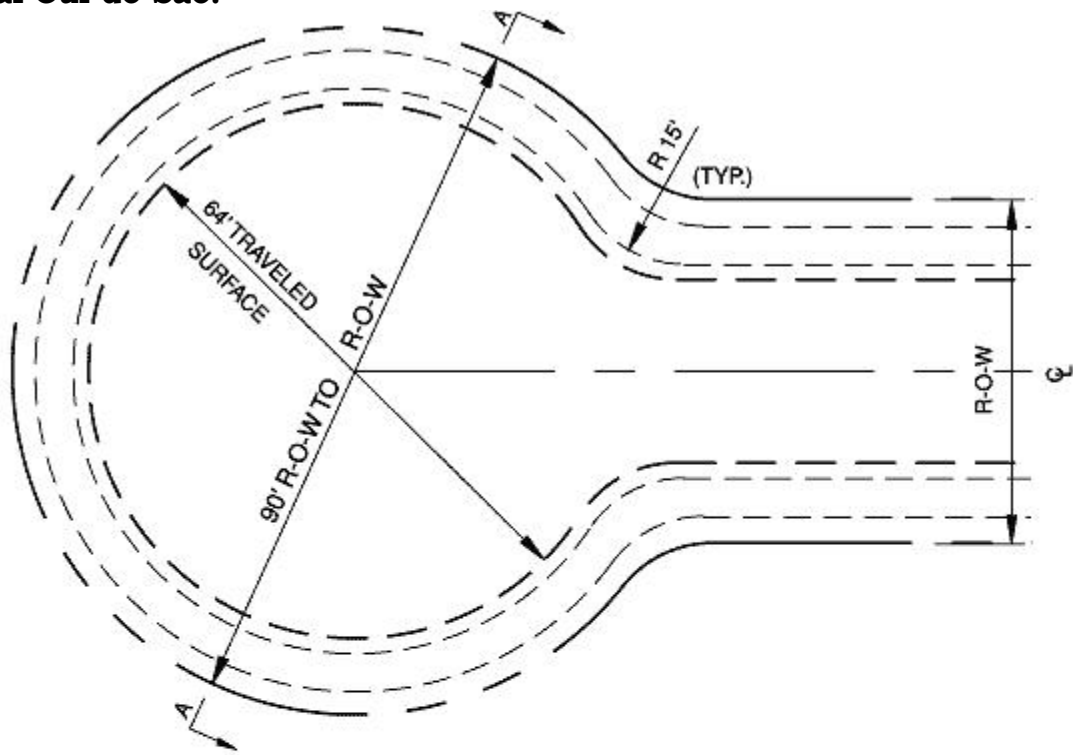
International Urban-Wildland Interface Code. 2003. International Code Council, INC.

Appendix K: Sample Specifications for Turnarounds:
 Hammer Head Turnaround:



NOTE:
 SEE SECTION 3.6.8 FOR
 DESIGN CRITERIA

Local Cul-de-Sac:



SECTION A - A

Fire Hazard & Mitigation

Santa Fe Trail Ranch

Community Wildfire Protection Plan

Legend

- Roads
- Santa Fe Trail Ranch Boundary
- Lot Lines with lot Numbers

Wildfire Hazard

- Moderate
- High

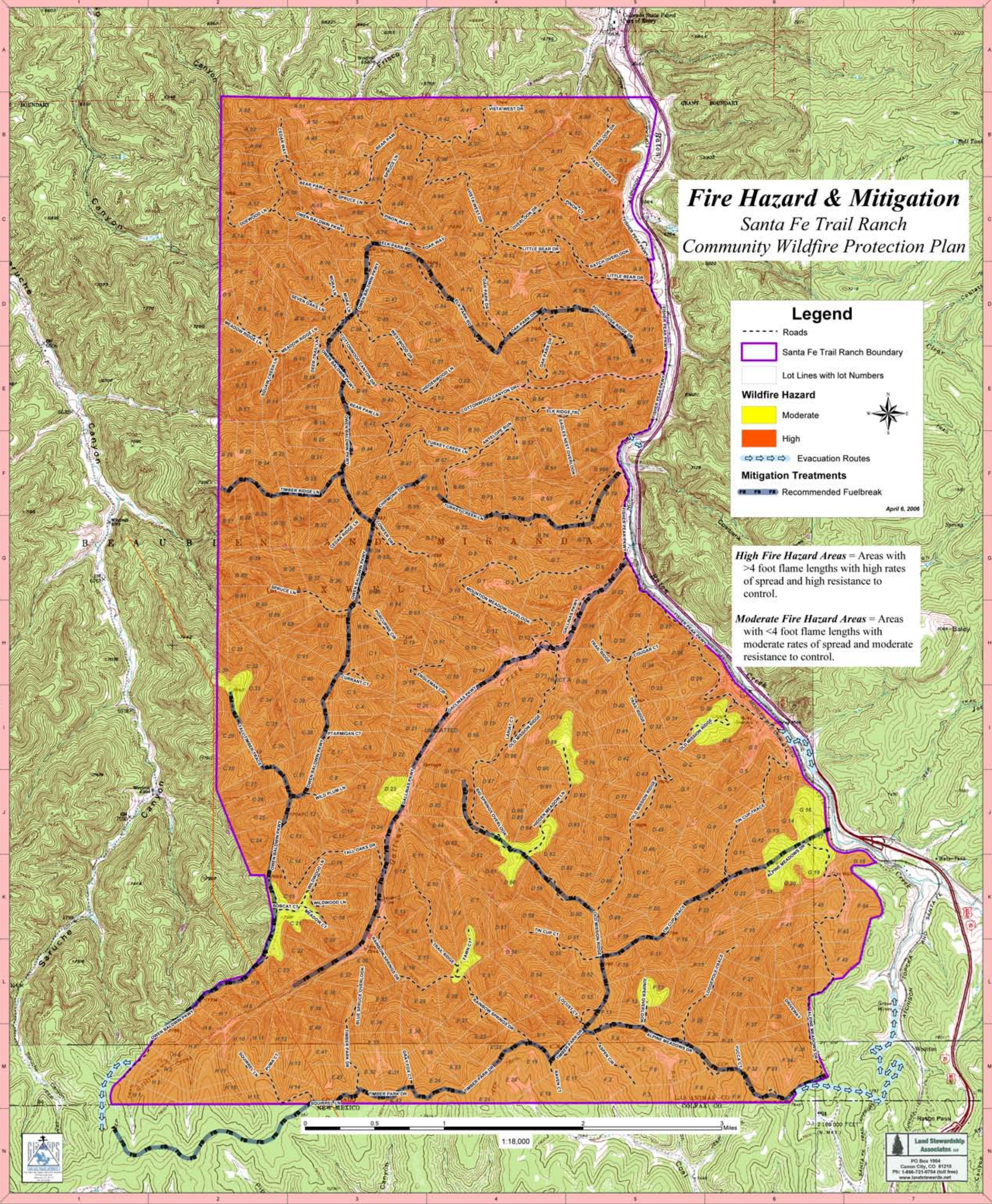
Mitigation Treatments

- Evacuation Routes
- Recommended Fuelbreak

April 6, 2006

High Fire Hazard Areas = Areas with >4 foot flame lengths with high rates of spread and high resistance to control.

Moderate Fire Hazard Areas = Areas with <4 foot flame lengths with moderate rates of spread and moderate resistance to control.



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 www.landsteward.com

Triage & Fire Control Features

Santa Fe Trail Ranch

Community Wildfire Protection Plan



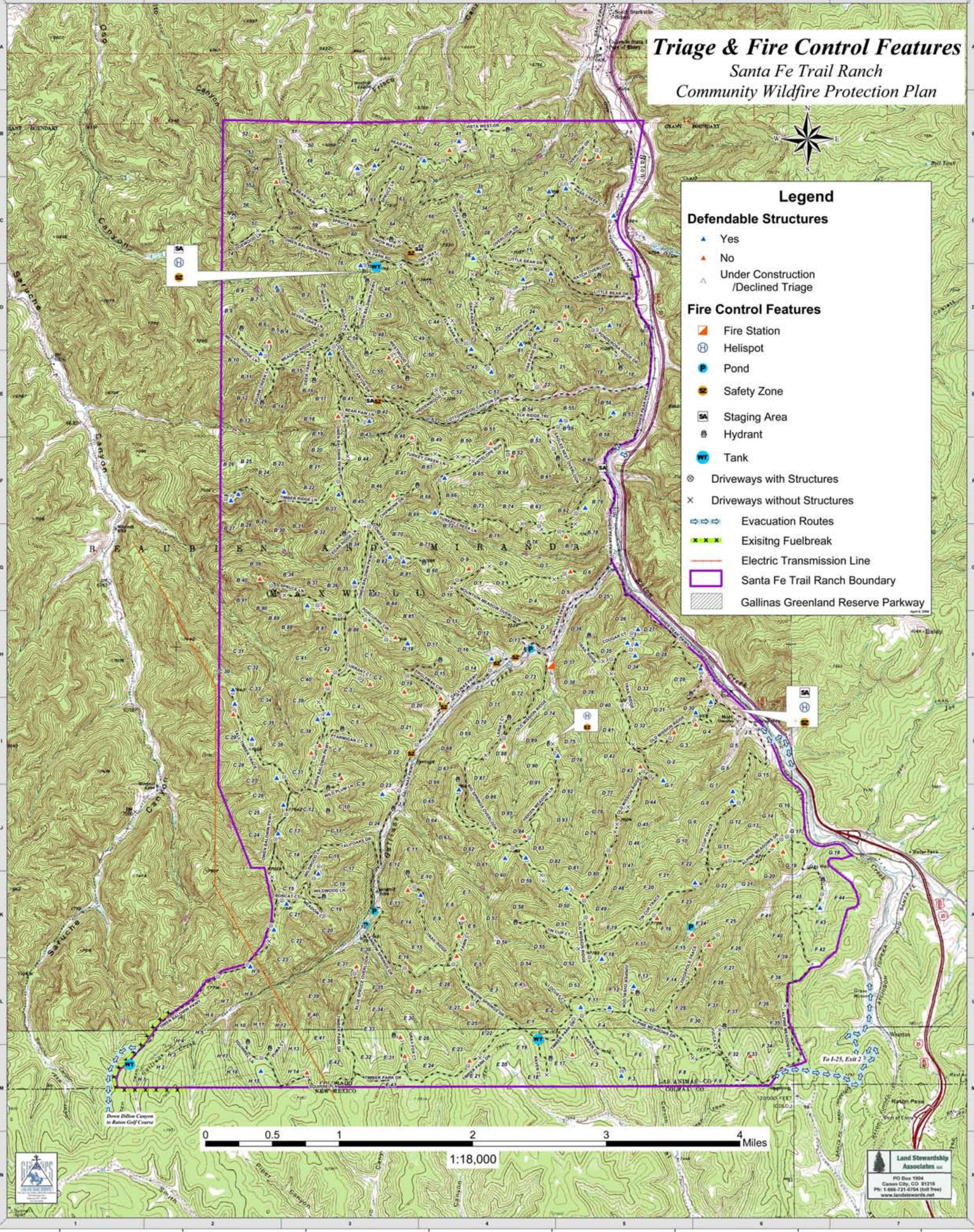
Legend

Defendable Structures

- ▲ Yes
- ▲ No
- △ Under Construction / Declined Triage

Fire Control Features

- 🔥 Fire Station
- 🚁 Helispot
- 🌊 Pond
- 🛡️ Safety Zone
- 📦 Staging Area
- 🚰 Hydrant
- 🛢️ Tank
- ⊗ Driveways with Structures
- × Driveways without Structures
- ➡️ Evacuation Routes
- 🚧 Existing Fuelbreak
- ⚡ Electric Transmission Line
- 🟪 Santa Fe Trail Ranch Boundary
- 🛣️ Gallinas Greenland Reserve Parkway



0 0.5 1 2 3 4 Miles

1:18,000

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Triage & Fire Control Features

Santa Fe Trail Ranch

Community Wildfire Protection Plan



Legend

Defendable Structures

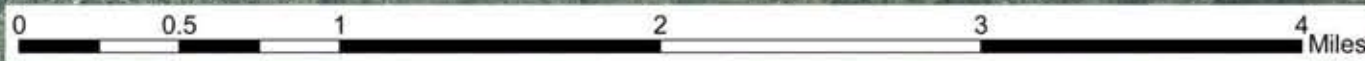
- ▲ Yes
- ▲ No
- △ Under Construction /Declined Triage

Fire Control Features

- 🔥 Fire Station
- Ⓜ Helispot
- 🌊 Pond
- 🚚 Safety Zone
- 📏 Staging Area
- Ⓜ Hydrant
- 🚛 Tank
- ⊙ Driveways with Structures
- × Driveways without Structures
- ⇄ Evacuation Routes
- ⚡ Existing Fuelbreak
- ⚡ Electric Transmission Line
- 🟪 Santa Fe Trail Ranch Boundary
- ▨ Gallinas Greenland Reserve Parkway

Down Dillon Canyon to Rabbit Golf Course

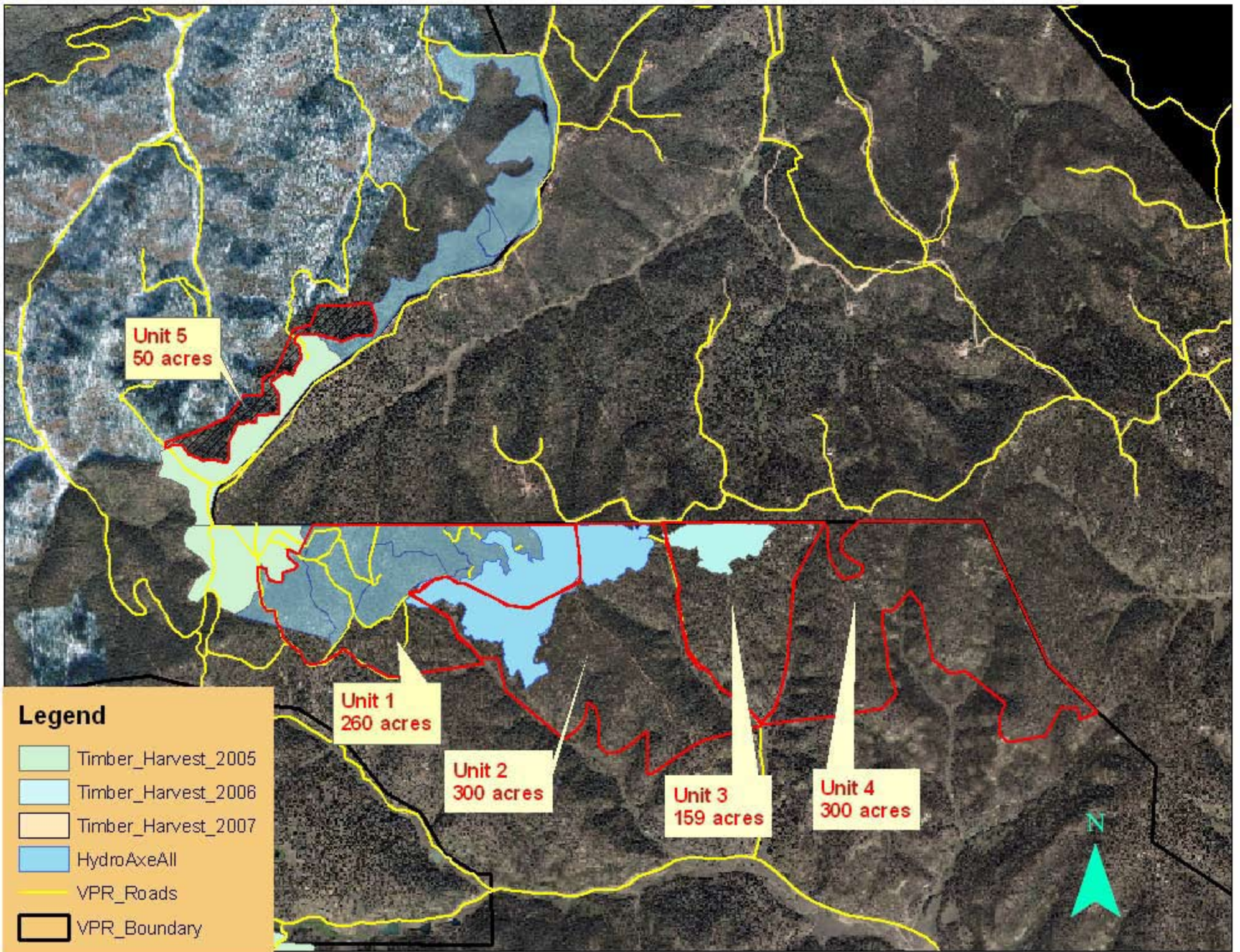
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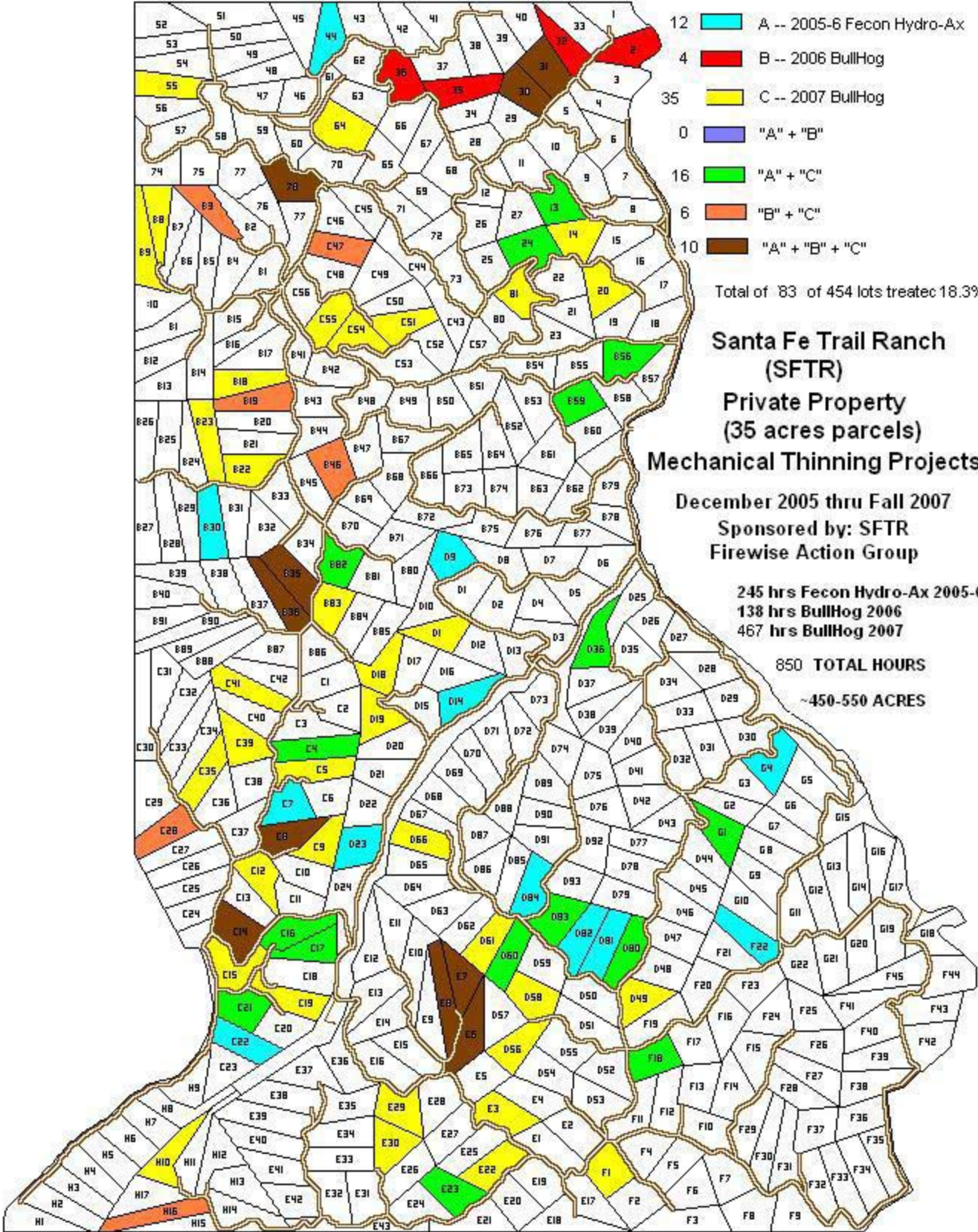


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 www.landstewardship.net





- 12 ■ A -- 2005-6 Fecon Hydro-Ax
- 4 ■ B -- 2006 BullHog
- 35 ■ C -- 2007 BullHog
- 0 ■ "A" + "B"
- 16 ■ "A" + "C"
- 6 ■ "B" + "C"
- 10 ■ "A" + "B" + "C"

Total of 83 of 454 lots treated 18.3%

**Santa Fe Trail Ranch
(SFTR)**

**Private Property
(35 acres parcels)**

Mechanical Thinning Projects

December 2005 thru Fall 2007

**Sponsored by: SFTR
Firewise Action Group**

**245 hrs Fecon Hydro-Ax 2005-6
138 hrs BullHog 2006
467 hrs BullHog 2007**

850 TOTAL HOURS

~450-550 ACRES