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Costilla County Community Wildfire Protection Plan



Land Stewardship Associates, LLC.
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Community Wildfire Protection Plan Costilla County

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Preface:

A Community Wildfire Protection Plan (CWPP) is a local wildfire protection plan that can take a variety of forms, based on the needs of the community. The CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection – or all of the above.

The process of developing a CWPP can help a community clarify and refine its priorities for protection of life, property and critical infrastructure in the wildland-urban interface. It also can lead community members through valuable discussions regarding management options and implications for the surrounding watershed.

CWPPs also improve a community's ability to compete for grants to fund hazard mitigation projects prevention and preparedness education of residents in the community.

The wildland urban interface (WUI) is another term found throughout this document. It can be simply described as the geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels. For the purposes of community wildfire protection planning a more specific definition is used. The Healthy Forest Restoration Act defines wildland-urban interface as:

- a.) an area extending ½ mile from the boundary of an at risk community.
- b.) an area within 1.5 miles of the boundary of an at risk community, including any land that;
 1. has a sustained steep slope that creates the potential for wildfire behavior endangering the at risk community,
 2. has a geographic feature that aids in creating an effective fire break, such as a road or ridge top,
- c.) an area that is adjacent to an evacuation route for an at risk community that requires hazardous fuels reduction to provide safer evacuation from the at risk community.

COMMUNITY IDENTIFICATION AND DESCRIPTION

The Costilla County (CC) Community Wildfire Plan covers most of the county which is located in the San Luis Valley in south central Colorado. It covers an area of approximately 1,215 square miles or 777,600 acres and ranges in elevation from 7,500 feet on the southwest corner to over 14,000 feet at Culebra Peak on its eastern boundary. The western county line follows the Rio Grande River. Culebra and Trinchera Creeks are the primary drainages in the area. The Costilla County Fire Protection District (CCFPD) provides both structure and wildland fire protection to most of Costilla County. The Blanca Fire Protection District provides protection for the Blanca area which is totally surrounded by the CCFPD.

Numerous small towns are included within the area. San Luis is the county seat and the largest town in the county. US Hwy 160 and State Hwys. 142 & 159 are the three principal travel routes through the area. The following vicinity map identifies the location of the area and its proximity to the remainder of the San Luis Valley.

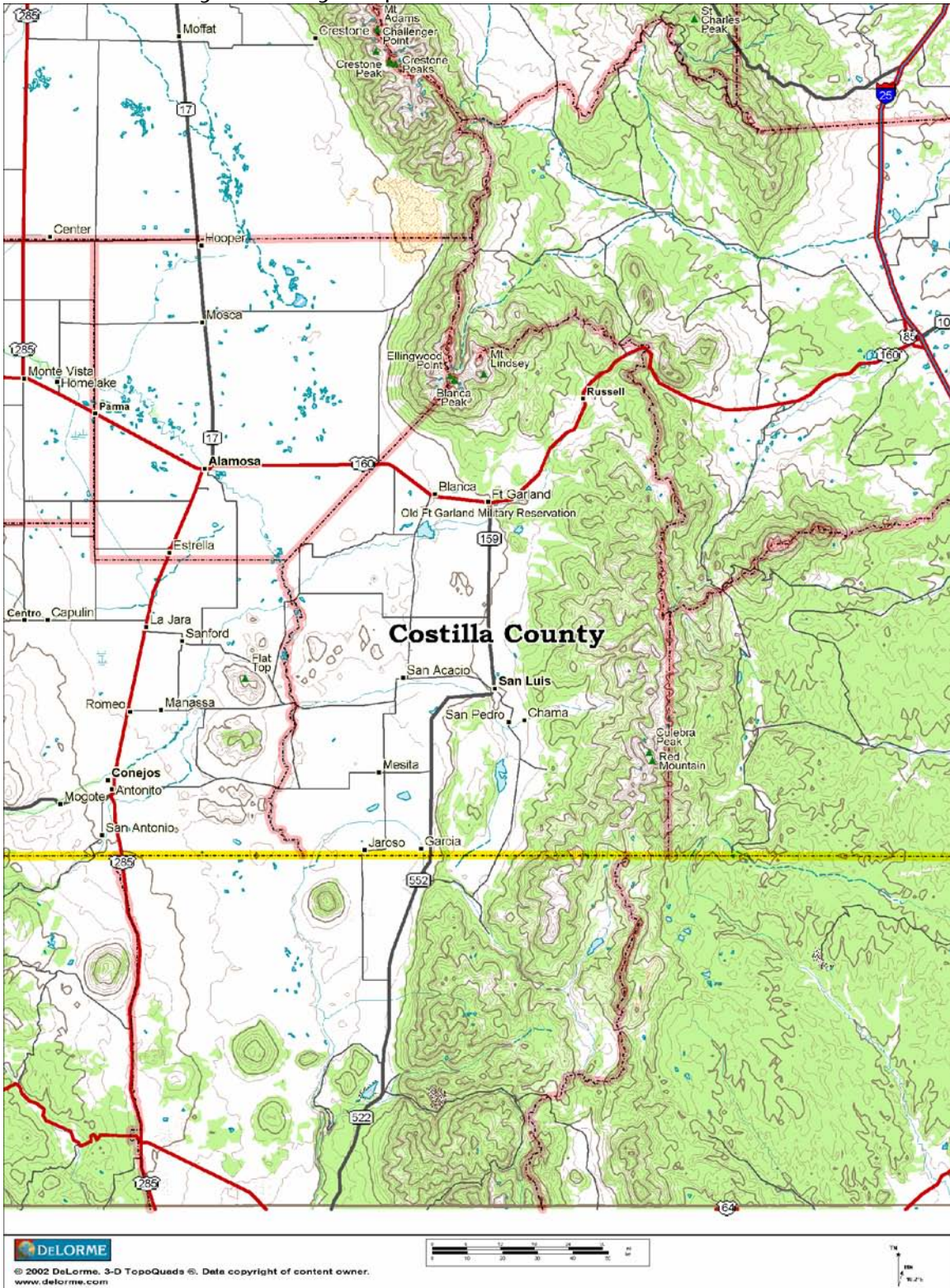
Thirty one subdivisions are lumped into eleven Wildland Urban Interface (WUI) areas within CC. They are listed in Table 1. 203,230 acres have been designated as WUI in CC.

Lower elevations are dominated by grass, sagebrush and pinyon pine. The valley floor also has some center pivot irrigated land where potatoes, grains and hay are raised. Higher elevations transition to ponderosa pine/Douglas-fir/aspens montane and Engelmann spruce forests. Ponderosa pine/Douglas-fir and spruce forests are generally dense enough to sustain a substantial crown fire resulting in a high fire risk.

The west side of Costilla County is characterized by rural subdivisions with parcels usually in the thirty five acre size class. Sagebrush is the dominant fuel type and will carry moderate intensity, fast moving wildfires on a dry windy day. Present structure density does not justify designation as wildland-urban interface. This does not negate the need for sound "FireWise" practices around all structures west of highway 159.

Public lands in the form of Bureau of Land Management, Colorado State Land Board, and US Forest Service are absent in Costilla County. This means that all wildfire hazard mitigation opportunities and responsibilities fall on private landowners.

Costilla County Vicinity Map



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US Hwy 160 and Colorado State Highways 142 & 159 provide primary paved access with numerous high quality County gravel roads providing access to the various neighborhoods. Road quality within subdivisions varies dramatically.

CCPD has its' main station located in San Luis with additional stations in Fort Garland, Garcia and Los Fuertes. Blanca FPD has a station in Blanca. Mutual aid from other Fire Districts such as Alamosa, and several Conejos county FPDs take considerable time to arrive on scene

The initial CWPP Core Team meeting was held on June 27, 2008. Participants included members of the Costilla County Fire Protection District, Costilla County Office of Emergency Management, Colorado State Forest Service, Costilla County Sheriff's Department, San Luis Valley Resource Conservation and Development Council, Trinchera Ranch and Land Stewardship Associates.

The Core Team reviewed the overall wildland fire protection situation in CC and discussed issues, concerns and opportunities. WUI boundaries were delineated on a map. Station wildland resource inventories were discussed.

Area Stakeholders were invited to attend an Interested Parties Meeting on August 2, 2008 at the San Luis Parish Hall. Newspaper articles, radio public service announcements and posters were hung in various locations throughout Costilla County. _____ stakeholders attended the meeting.

Table 1 Wildland Urban Interface Communities Costilla County

WUI Name	Acres
Blanca	3,499
Forbes Park	16,810
Forbes Wagon Creek Ranches	21,255
Fort Garland	740
Mesita	551
Mountain Lake Ranch	6,191
San Acacio	6,372
San Luis Valley Ranches North	13,116
Sangre de Cristo Ranches	80,453
San Pedro Mesa	40,123
Vallejos Creek	14,120
Total Acres	203,230

COMMUNITY ASSESSMENT

The overall risk within Costilla County from wildland fire varies from high to low depending upon a wide variety of factors. This section will discuss the facets considered that led to the overall ratings.

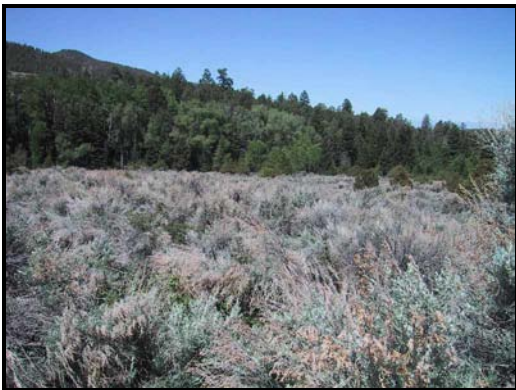
Fuel Hazards

Dense ponderosa pine and Douglas fir stands cover mountainous portions of the planning area while grass and shrub types are found at lower elevations. WUI areas cover the full spectrum of fuel hazards.

Foothills grass and shrub fuel loading are highly variable ranging from good strong fuel models 1 & 2 and some 6. Fires in the denser grass and shrub types can be very difficult to control on the typical dry, windy afternoon common in the region. See Appendix B for a full discussion of Fuel Models

Fuel models associated with the mountainous WUIs include 1, 2, 6, 8, 9, 10, 11 and a blend of 6/9. All stands adjacent to structures with crown densities greater than forty percent are problematic. Continuous surface and crown fuel arrangement, both horizontally and vertically, render this area susceptible to torching, crown fire, and ignition by embers, even under moderate weather conditions.

The following maps showing CC WUIs, Wildfire Hazards and Fuel Models indicate the majority of the WUIs have a fuel hazard assessment of moderate to high. Local topography and poor vehicle access further aggravates fire behavior and control.



Sage Brush Sangre de Cristo Ranches



Heavy dead/down fuel Forbes Park

Costilla County - Wildland Urban Interfaces



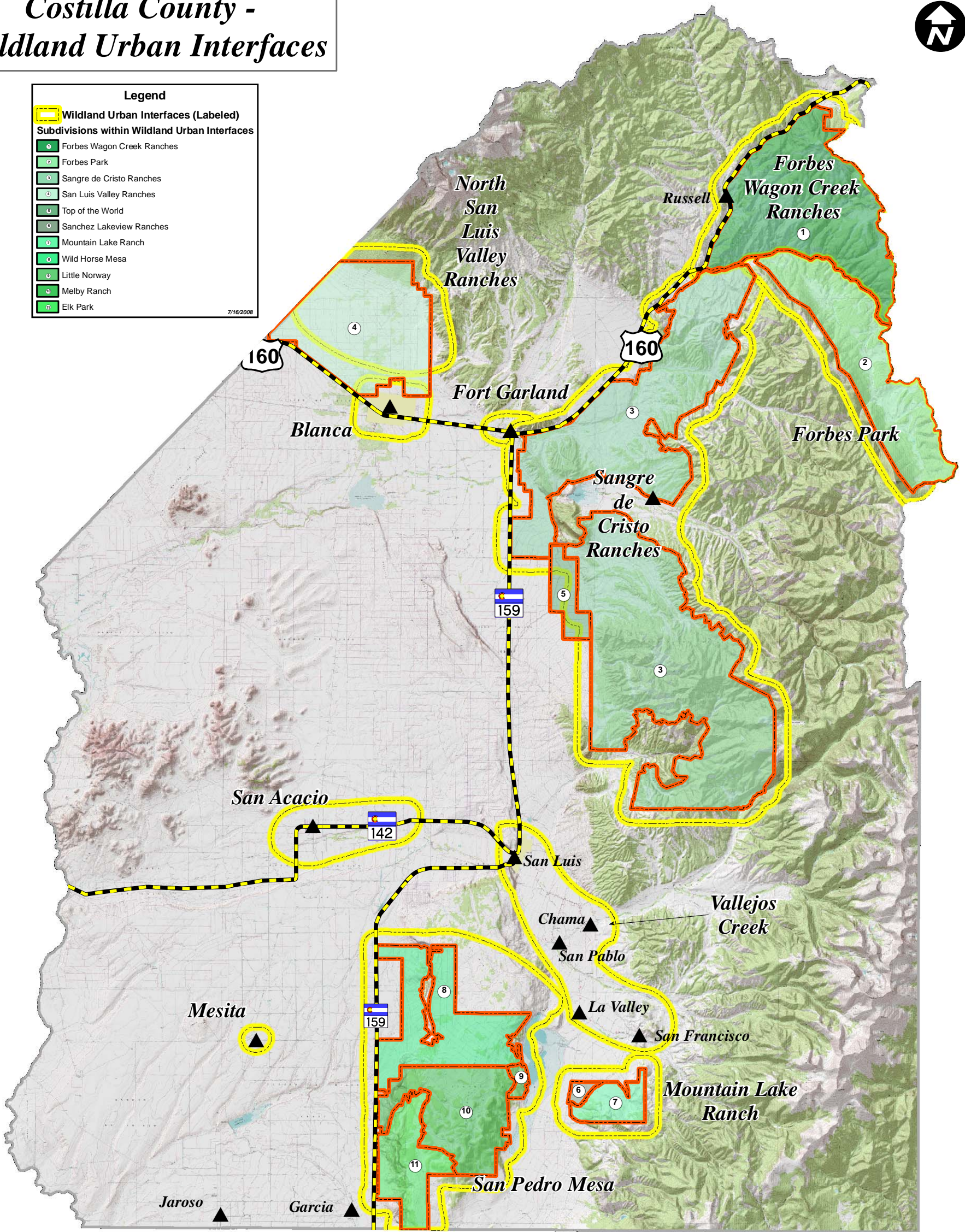
Legend

Wildland Urban Interfaces (Labeled)

Subdivisions within Wildland Urban Interfaces

- Forbes Wagon Creek Ranches
- Forbes Park
- Sangre de Cristo Ranches
- North San Luis Valley Ranches
- Top of the World
- Sanchez Lakeview Ranches
- Mountain Lake Ranch
- Wild Horse Mesa
- Little Norway
- Melby Ranch
- Elk Park

7/16/2008



Costilla County - Fire Hazard



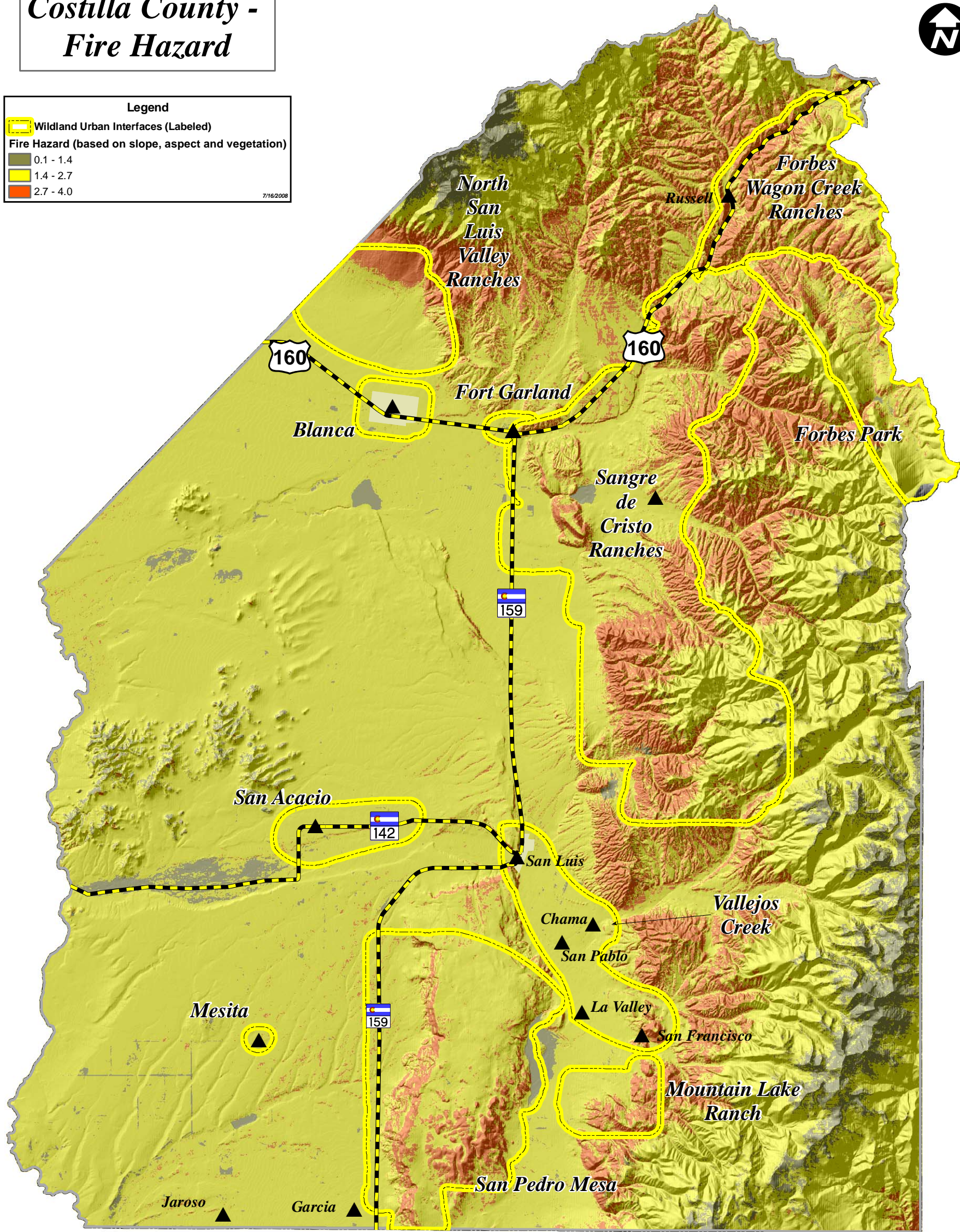
Legend

Wildland Urban Interfaces (Labeled)

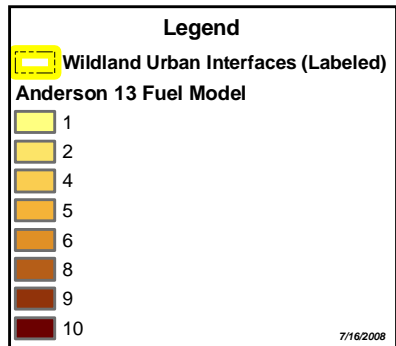
Fire Hazard (based on slope, aspect and vegetation)

- 0.1 - 1.4
- 1.4 - 2.7
- 2.7 - 4.0

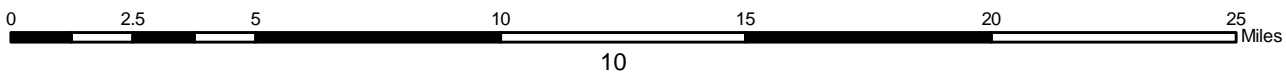
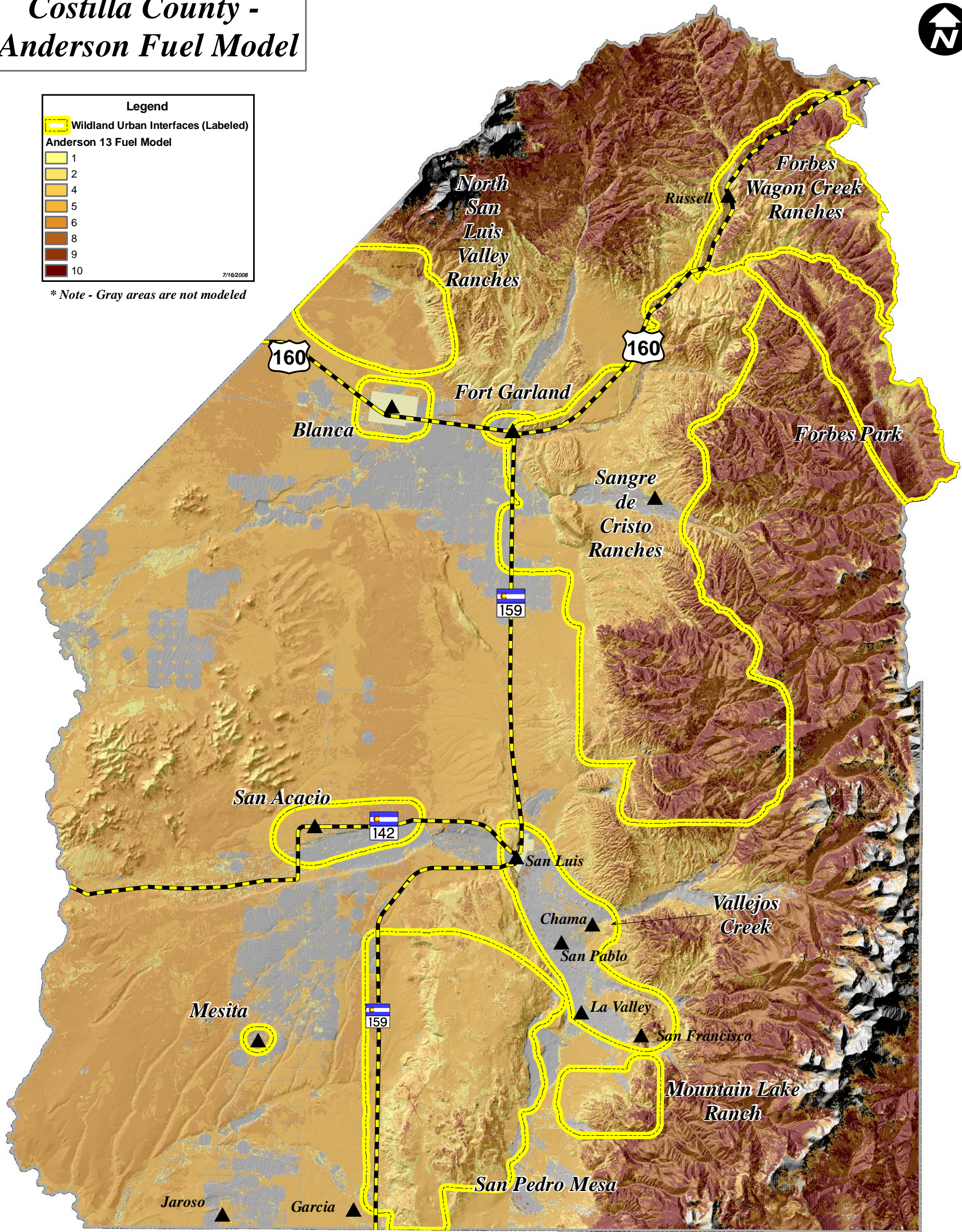
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Costilla County - Anderson Fuel Model



* Note - Gray areas are not modeled



Risk of Ignition and Wildfire Occurrence

Wildland fires have burned throughout the fire protection district ever since lightning and dry biomass have been present on the landscape. An astute observer will note the many old fire scars in forested areas. Charred stumps, snags and large aspen stands date back to the late 1800s when drought combined with lightning to create a vegetative mosaic we enjoy today. Wildfires were less prevalent during the 1900s due in part to a moister climate and to rapid initial attack of small fires. The recent increase in wildfire numbers and intensity is attributable to a prolonged drought and forest stands that are much denser and hence; more prone to hot crown fires.

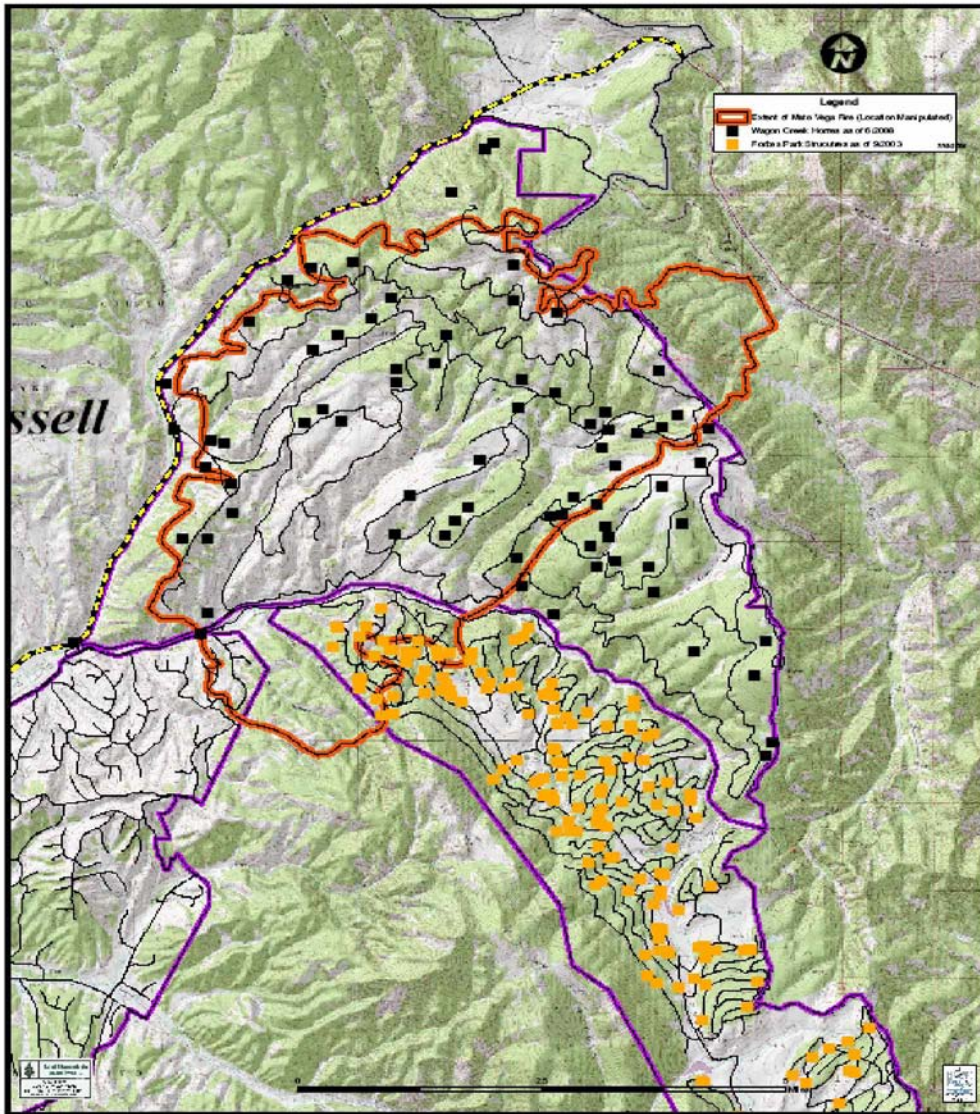
The Mato Vega Fire of 2006 is a harsh reminder of what is in store for much of the forested area in the county. Over the course of just a few days it burned over 13,000 acres. Fortunately no structures were in its path. Forbes Wagon Creek Ranches and Paradise Acres were evacuated during the peak of the fires spread. Highway 160 was also closed for several days due to smoke and fire operations.

The Million Fire of 2002 burned over 11,000 acres in Rio Grande County and destroyed 33% of the structures in Willow Park subdivision. The Sand Dunes Fire of 2000 burned over 8,500 acres in one burning period and destroyed one structure in Great Sand Dunes National Park & Preserve.

Low fuel moistures and relative humidity are common in the area, as are periods of high winds. When dry, windy conditions coincide, the stage is set for large, troublesome wildfires. Human population is increasing in the area. Fires originating in or near communities are the most immediate concern, but fires starting well beyond the boundaries of the WUI area can have profound effects upon the communities if they burn with typical rates of spread and intensity. Rapid rates of spread and long distance spotting (1/4 to 1 mile) are the norms for fires in the vicinity.

Areas classified as high to moderate fuel loading are the most worrisome. Table 2 provides fire behavior predictions for several fuel models under representative weather conditions.

The next map overlays the footprint of the Mato Vega fire over portions of Forbes Park and Forbes Wagon Creek Ranches to demonstrate the number of structures threatened by a similar fire in the future.



Mato Vega fire footprint overlaid on Forbes Park & Forbes Wagon Creek Ranches

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Table 2: Costilla County WUI Fire Behavior Predictions

FUEL MODEL	RATE of SPREAD (ft/hr)	FLAME LENGTH (Feet)	SIZE @ 1 HOUR (Acres)	PERIMETER @ 1 HR. (Miles)	SPOTTING DISTANCE (Miles)
101	1,069	2	11	0.51	0.06
1	8,910	5	624	4	0.6
2	1,947	6	30	1.74	0.6
6	2,818	7	62	1.29	0.6
8	172	1	0.2	0.08	0.6
9	1,254	4	10	0.54	0.6
6/9	1,835	7	26	0.84	0.6
10	712	6	4	0.33	0.6
11	488	4	2	0.23	0.6

Note: Flame lengths shaded in orange exceed the 4 foot hand crew control threshold. Crown fires are likely when canopy closure exceeds 40%.

In fuel model 1, grass is the primary fire carrier. Fuel model 2 is composed of a mix of grass and shrub wherein the shrubs add fuel bed depth and fire intensity. Young dense stands of conifers are usually classified as fuel model 6 when the crowns will be the primary carrier of fire. Tall, dense sagebrush is also fuel model 6. Short needled stands of spruce and fir are fuel model 8. Taller closed canopy ponderosa pine stands usually are classified as fuel model 9 due to the long needled litter layer that covers the ground. The combination of fuel models 6 & 9 best represents the fire characteristics manifested by fires in the vegetative mosaics found in the pine/sage transition zone. Fuel model 10 represents the stands of Douglas-fir that have considerable dead/downed woody material on the forest floor. Fuel Model 11 best represents areas where significant dead/down trees have accumulated following insect mortality.

Community Values at Risk

Values – There are eleven communities, “neighborhoods” or subdivisions with concentrated home sites in the CC WUI areas. Table 3 gives a summary of the neighborhood wildfire hazard evaluations. Many have heavy fuels nearby and around them. Others have rather light fuels in their vicinity.

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Less than a third of the structures have recognizable defensible space. Many have flammable material near by, on the porch or under decks, increasing their vulnerability. Composition and wooden roofs tend to hold pine needles and forest debris allowing accumulations that also increase vulnerability to fire brands. Most of the structures are vulnerable to wildfire damage occurring from firebrand ignition and/or radiation ignition due to the heavy forest fuels within the area. The details of neighborhood hazard evaluations are contained in Appendix G: Subdivision Hazard Evaluation Form.

Table 3: Neighborhood Wildfire Hazard

Low	Moderate	High	Extreme
Blanca	Mountain Lake Ranch	Forbes Park	North San Luis Valley Ranches
Fort Garland		Forbes Wagon Creek Ranch	
Mesita		Sangre de Cristo Ranches	
San Acacio		San Perdo Mesa	
Vallejos Creek			

Note: The sparsely populated areas west of highway 159 have low to moderate wildfire hazard. While the structure density rate does not justify designation as Wildland Urban Interface; it is still important that all structures have survivable space to protect them from the inevitable wildfire.

Access – The primary and secondary road access within the CC area is good. Road access within the various neighborhoods is much less predictable. Not all developments have more than one way into or out of the WUI, while others have two means of departure but one is so substandard that normal passenger vehicles would not be able to use it. Roads within subdivision areas and driveways are often narrow and steep. Turnarounds are marginal or lacking. Road signs and home / cabin addresses are spotty at best. There are many dead end roads that are very hazardous during wildfire operations and evacuations.

Risk – Because survivable space is lacking around many home sites and natural fuel continuity and steep slopes within some of the neighborhoods, it would be very difficult to protect some home sites from wildfire during periods of high to extreme fire danger.

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Evacuation – Evacuation planning is needed to minimize fire emergency confusion and risk to residents who might be asked to evacuate in the event of an emergency. Appendix D provides location of evacuation routes and other fire control features including safety zones, and guidelines for developing an evacuation plan.

In many cases sheltering in place may be a better option than attempting to notify and evacuate the occupants of sparsely developed, large subdivisions like Sangre de Cristo Ranches.

Sheltering in place is the norm in Australia where fire spread rates compromise evacuation procedures. Australians converted from evacuations to sheltering in place because they were not able to safely notify and remove residents from the large areas covered by wildfire. Once a family realizes their best option for surviving a wildfire is staying home they look at their property differently. To shelter in place one must have a good safety zone around their home and a very fire resistant structure. Fire shutters and cisterns are the norm. Once the flaming front passes the occupants can go outside and take action on any smoldering embers near the structure.

Sheltering in place is an alternative to evacuation that needs to be considered for areas where notification of occupants is time consuming and fire spread rates are high.



Steep, rough roads combined with heavy fuel with steep slopes, makes evacuation notification and evacuation very hazardous.

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Local Preparedness and Protection Capability

Costilla County has six fire stations as follows: (1) Blanca FPD, (1) San Pedro Mesa private, (4) Costilla FPD with stations in Fort Garland, Garcia, Los Fuertes, and San Luis. Equipment inventories by fire station are shown below.

Data to be provided by Fire Districts prior to final.

Blanca FPD:

ITEM	#	NEEDED
Total Volunteers		
Wildland Qualified		
Incident Commander Type IV		
Strike Team Leader		
Wildland Firefighter		
Brush Truck Type 6		
Water Tender Type3 (3,000 gal.)		
Water Tender Type 3 (1,550 gal.)		
Engine Type 1		
Equipment/Personnel Carrier Type X		
Portable Pumps (High Pressure)		
Portable Pumps (Volume)		
Fire Tool Cache		
Hand Held Radios		

San Pedro Mesa:

ITEM	#	NEEDED
Total Volunteers		
Wildland Qualified		
Brush Truck Type 6		
Water Tender Type3 (500 gal.)		
Water Tender Type 3 (800 gal.)		
Engine Type 1		
Equipment/Personnel Carrier Type X		
Portable Pumps (High Pressure)		
Portable Pumps (Volume)		
Fire Tool Cache		
Hand Held Radios		

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Fort Garland

ITEM	#	NEEDED
Total Volunteers	15	
Wildland Qualified		
Brush Truck Type 6	2	
Water Tender Type3 (500 gal.)		
Water Tender Type 3 (3,000 gal.)	1	
Engine Type 1	1	
Equipment/Personnel Carrier Type X		
Portable Tanks (3,000 gal)	2	
Portable Pumps (Volume)	2	
Fire Tool Cache		
Hand Held Radios		

Garcia

ITEM	#	NEEDED
Total Volunteers	5	
Wildland Qualified		
Brush Truck Type 6		
Water Tender Type3 (500 gal.)		
Water Tender Type 3 (800 gal.)		
Engine Type 1		
Equipment/Personnel Carrier Type X		
Portable Pumps (High Pressure)		
Portable Pumps (Volume)		
Fire Tool Cache		
Hand Held Radios		

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Los Fuertes

ITEM	#	NEEDED
Total Volunteers		
Wildland Qualified		
Brush Truck Type 6		
Water Tender Type3 (500 gal.)		
Water Tender Type 3 (800 gal.)		
Engine Type 1		
Equipment/Personnel Carrier Type X		
Portable Pumps (High Pressure)		
Portable Pumps (Volume)		
Fire Tool Cache		
Hand Held Radios		

San Luis

ITEM	#	NEEDED
Total Volunteers	15	
Wildland Qualified		
Brush Truck Type 6	2	
Water Tender Type3 (500 gal.)		
Water Tender Type 3 (2,500 gal.)	1	
Engine Type 1	1	
Equipment/Personnel Carrier Type X		
Portable Tanks (3,000 gal.)	2	
Portable Pumps (Volume)	2	
Fire Tool Cache		
Hand Held Radios		

Water Supply: The Rio Grande River, Culebra and Trinchera Creeks are all reliable sources of water year round. During dry spells other creeks in the area may have reduced flows to the point that they are difficult to draft out of. There are numerous springs, ponds, ditches and few lakes throughout the area. Reaching them to draught water can be problematic with large fire apparatus. CFPD has two volume pumps that facilitate filling tankers wherever sufficient water can be found.

Fire wells are another option for providing water for wildfire suppression. They are normally wells associated with agricultural activities. Several farmers have offered to make their wells available for fire suppression purposes.

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Railroad The San Luis Rio Grande Railroad goes over La Veta pass and goes through both the Forbes Park and Forbes Wagon Creek Ranches WUIs. Railroads are notorious sources of wildfires. Breaks are known to heat up on downhill grades and many wildfires are started by hot break shoes. The railroad passes through canyons with flashy grass fuels that are particularly prone to ignition from railroad activities.

They have an emergency action plan that describes how they will react to various emergencies. It does not speak specifically to wildfire hazard mitigation from their operations. They do weed and vegetation management along the line. If/when they perceive fire hazard is high they anticipate placing a water spray rig on the train for initial attack of any fires they may cause.

Insert photo of steam engine.

COMMUNITY MITIGATION PLAN

The Core Team developed the following mitigation plan based on their knowledge of the wildland fire issues in Costilla County. The strategy basically addresses survivable space needs with some fuel treatments along evacuation routes and for safety zones.

Essential to the success of the plan is the involvement of the private landowners. Implicit to the plan is "ownership of the fire problem" by private landowners. While Costilla County and CSFS have worked hard to promote survivable space and land management, private landowners must accept responsibility for completing work on their own lands. Incorporated in the private land treatments is the task of working with individual landowners to improve survivable space in the ignition zone around the buildings.

Commendations:

Costilla County has a "Multi-Jurisdictional Multi-Hazard Mitigation Plan" dated October 2007. It describes mitigation measures for a wide variety of natural hazards and events such as landslides, snowstorms, floods wildfires and others. This Community Wildfire Protection Plan is the next step in developing intensive actions to address wildfire hazards identified in the above document.

Forbes Wagon Creek Ranches (FWCR) has a CWPP in place and is actively working to reduce wildland fire hazards within the development. A copy of the FWCR CWPP can be found in appendix M.

Residents of Forbes Park have been doing considerable fire hazard reduction work within the subdivision. They have an active wildfire hazard mitigation group that is encouraging FireWise practices with individual lot owners.

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Fuel Hazard Reduction

One of the best ways to reduce structure loss in the wildland urban interface is to avoid placing structures in close proximity to flammable vegetation. However, it is unlikely that development in the WUI will decline as long as property owners have the right to live in forested areas and develop their land however they choose.

The other option is to reduce the intensity of wildfires that will burn through areas surrounding structures. Much of this responsibility falls on the homeowner, developer and future purchasers. When isolated developed parcels are scattered across forested lands the question becomes how culpable are State and County governments for developments placed in naturally hazardous vegetation. In the past, private land owners have expected someone else to do most of the fire hazard reduction on lands immediately adjacent to subdivisions. This convenient transfer of responsibility to someone else saved developers and individual homeowners money and allowed them to have a more "*natural setting*" around their home. When the inevitable fire burns across the landscape it does not discriminate between developed and undeveloped land. Crown and spot fires have a way of neutralizing well intended, limited scale, fuel reduction projects. A well tended forest a half mile from a structure may reduce the intensity of a fast moving wildfire but it will not significantly improve survivability of structures in developments that have not completed their own fire hazard reduction work.

A long overdue movement is in the wind. WUI fires are very expensive and dangerous. Wildland fire agencies are starting to expect folks to tend to their structures survivability. Placing firefighters in the path of a fast moving, high intensity fire to save structures is not an acceptable practice today.

Reducing flammability around all structures is the key to preventing structure loss. The Colorado State Forest Service and FireWise program have excellent brochures on all facets of structure fire hazard mitigation.

One of the most cost effective tools land managers have to treat large expanses of wildland is prescribed burning. Prescribed fire is an appropriate tool to reduce fire hazard and at the same time promotes long term vegetative health. This plan recognizes the value of prescribed burning and supports its use in reducing landscape level wildfire hazards in the county.

Appendix A: Maps: contains maps of fuel treatment for the various CC WUIs. They depict locations of the suggested treatment areas listed in

Table 4. Priorities for reducing fuel hazards were based on the following criteria:

Priority 1: Protection of structures; survivable space around structures and areas adjacent to communities.

Priority 2: Thin or mow fuels along roads for evacuation and firefighter ingress and egress.

Priority 3: Prescribe burn all ponderosa pine and Douglas-fir areas within and adjacent to WUIs on public lands.

Table 4: CC Fuel Treatment along Evacuation Routes & Safety Zones
To be completed when areas are refined by Core Team.

WUI AREA	MOWING SHRUBLAND MILES OR ACRES	MOW COST \$/ACRE	TOTAL COST \$	PRIORITY
Sangre de Cristo Ranches				
Forbes Park				
San Pedro Mesa				

Mountain Lake Ranches has substantial dead down woody fuels immediately adjacent to the roads. This material is the debris associated with road construction. It compromises the roads effectiveness as an evacuation route and also as a fire control feature. Apparently there was some recognition of the problem and people were allowed to remove firewood from this debris. There is still slash to remove to make the roadways safer during wildfires.

This is just one example flammable of road construction debris in Mountain Lakes subdivision.



Wildfire Prevention and Fire Loss Mitigation

Prevention strategies focus on education, burning restrictions and closure orders. There is a need to improve the process of initiating and coordinating fire restrictions. The best and most favored approach is to develop uniform actions based on the National Fire Danger Rating System adjective ratings. In depth discussions about thresholds for various restrictions can occur during the winter and be automatically triggered when fire hazard warrants, without a flurry of last minute phone calls. Prearranged actions take a lot of the hassle out of the implementation of fire restrictions and facilitate communications among cooperators.

Survivable space is the key to structure survival. Costilla County along with CSFS should initiate an on going program to encourage individual landowners to redeem their responsibility while living in wildfire prone areas. This includes advocating FireWise home construction.

The San Luis Rio Grande Railroad poses a threat to the Forbes Park and Forbes Wagon Creek Ranch areas. Their emergency action plan does not speak specifically to wildfire hazard mitigation along the line. It would be good for the county, railroad and fire department to get together and discuss railroad fire prevention and initial attack of fires originating from railroad operations.

Home Ignition Zone



A home with its immediate surroundings (about 100-150 feet from the structure) is the home ignition zone.

Recent research into the cause for loss of homes during wildfires indicates that home ignitability, rather than wildland fuels, is the

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principal cause of home losses during wildland/urban interface fires. Key items are flammable roofing materials (e.g. cedar shingles) and the presence of burnable vegetation (e.g. ornamental trees, shrubs, wood piles, and pine needle accumulation) immediately adjacent to homes (Cohen, 1999).

The home ignition zone includes a home and its immediate surroundings within 100 to 150 feet of the structure. Fuel conditions within this zone, to a large degree, will determine whether a home will survive a wildfire. High intensity fire behavior beyond the home ignition zone does not transfer enough energy directly from its flames to ignite a wooden structure. The fuels surrounding a home within the home ignition zone principally determine the potential for directly igniting the home. Firebrands lofted from extreme wildfires must directly ignite on a structure to be an effective ignition source. If firebrand ignitions occur in the fuels surrounding a home, then those fuels determine the home's ignition potential. Thus, regardless from how far firebrands travel a home's exterior materials and design principally and fuels in the home ignition zone determine its ignition potential from firebrands.

The primary and ultimate responsibility for home wildfire protection lies with private homeowners, not public land management agencies (or taxpayers). It is critical that special attention be given to removing fuels in the home ignition zone as well as preparing a defensible space around structures to improve their chances of surviving a wildfire. This includes insuring that there are no combustible materials like concentrations of pine needles, dry grass, hay or straw, firewood, deck furniture, open windows, open vents, household trash, flammable materials such as gasoline, diesel or paint thinners, paper boxes, and fabrics near the structure or in the home ignition zone for fire brands to land on. In the past few years research has found that a significant number of homes destroyed in wildfires burned as the result of the presence of combustible materials within the home improvement zone. Some homes burned as long as 8 hours after the fire front passed.

Communications

Hand held radios are an important communications tool during wildland fire control activities. Firefighters are often scattered across the fire area and not necessarily in close proximity to their trucks. Communication between the lookout and personnel on the fireline is critical.

County Wildfire Standards for Subdivisions

Costilla County currently requires a wildfire hazard mitigation plan for new structures. It does not described the contents of the plan or suggest any standards for mitigation. Private land development in fire prone areas should not be permitted without wildfire hazard reduction as part

of the improvement. Land development without attendant fire hazard reduction exacerbates the fire hazard problem and perpetuates the expenditure of public funds to protect structures in a wildfire situation.

Many of the basic wildfire hazard issues such as poor access i.e.; one way ingress and egress, steep/narrow road grades, cul-de-sac diameter, vegetative flammability, building construction, roofing materials and survivable space requirements are best addressed at the time a subdivision is being designed and approved.

Colorado counties have a wide variety of wildfire hazard mitigation standards for land development. They range from no mention of wildfire issues to complex standards that stipulate specific criteria for wildfire hazard mitigation, road and driveway design, emergency water supplies, survivable space, and fire resistant structure construction. Generally the more urban forested counties have the strictest fire codes.

The “*International Urban-Wildland Interface Code*” of 2003 establishes minimum regulations for land use and the built environment in designated urban-wildland interface areas using prescriptive and performance related provisions. It is founded on data collected from tests and fire related incidents, technical reports and mitigation strategies around the world. It is a good reference to work from as Costilla County develops its wildfire hazard mitigation standards.

Archuleta County provides a good example for Costilla County to emulate. The following information, extracted from Archuleta County’s Planning and Zoning guide and their Road and Bridge Standards, is suggested as a starting point for consideration:

5.2.2.4 Wildfire Hazard Areas:

The County shall not approve any development if the proposed project is located in an identified wildfire hazard area, or is suspected by the County to be in a wildfire hazard area, unless the developer can submit adequate evidence, prepared by a qualified professional forester, that the proposed project meets the following criteria:

5.2.2.4.1 Any project in which residential activity is to take place shall be designed to minimize significant hazards to public health and safety or to property.

5.2.2.4.2 All projects shall have adequate roads for emergency service by fire trucks, fire fighting personnel, and firebreaks or other means of mitigating conditions conducive to fire.

5.2.2.4.3 Precautions required to reduce or eliminate wildfire hazards shall be provided for at the time of initial development.

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5.2.2.4.4 The project will adhere to the Guidelines and Criteria for Wildfire Hazard Areas promulgated by the Colorado State Forest Service.

5.2.2.4.5 Consideration shall be given to the recommendations of the Colorado State Forest Service, resulting from review of a proposed project in a wildfire hazard area.

5.3.9 Fire Protection System:

If the project is within an existing fire protection district, written confirmation is required that current fire code requirements have been met. If outside a fire protection district a fire protection plan shall be reviewed by the Costilla County Sheriff, Fire Chief of the appropriate Fire Protection District or other qualified individual. The County shall not approve any project without implementation of an adequate fire protection plan.

Archuleta County Road and Bridge Standards that relate specifically to emergency vehicle access include maximum grades by road type and the following wording scattered throughout the document:

Where cul-de-sac road are approved turnouts shall be provided. Bulb type turnarounds shall have a minimum road surface of 90 feet in diameter and minimum right-of-way of 110 feet in diameter. An alternative to the bulb type turnaround is the use of hammerhead turnaround.

The maximum length of roads ending in turnarounds shall be 600 feet in areas with a high wildfire hazard and 1,000 feet in all other areas. When a variance from this standard is requested at least one of the following shall be provided:

- a. central water service,*
- b. an alternative water supply acceptable to the local fire authority,*
- c. monitored residential sprinklers in all residences on the cul-de-sac.*

In addition, turnouts may be required when a variance is requested.

Driveway Widths: The dimensions of driveway widths and centerline curve radii shall be as shown in Table 27-12.

Single family residence driveways in excess of 400 feet in length shall provide an adequate turnaround for emergency equipment within 150 feet of the dwelling unit. Driveways serving multi family, industrial or commercial development shall provide a turnaround as specified in Figure 27-7 if the driveway has a dead end.

The County can also take a significant step in reducing structure losses from wildfire by stipulating the following improvements in the building permit process:

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- At least two ways into and out of the subdivision
- Adequate driveways with turn-arounds suitable for use by fire fighting equipment
- Street signs constructed of non-flammable materials
- Addresses that are posted at the intersection of the main road and the driveway
- Propane tanks that are at least 75 feet from structures
- Fire resistant siding and roofing materials
- Chimneys and stove pipes will have caps and spark arrestors

These few requirements will have substantial impacts on survivable space and first responder efficiency.

Strategic Recommendations:

Costilla County relies on volunteers to provide all the fire services for a large area. Adding additional work such as FireWise consultations and working with County Commissioners to improve planning, zoning, road and bridge standards will increase the workload for this dedicated but over-committed group.

We recommend funding a part time CWPP project coordinator. This staff would work throughout Costilla County with the Office of Emergency Management to improve policies and regulations related to wildfire hazards in the Land Development Code and provide onsite FireWise consultations to WUI residents.

State Tax Incentives for Wildfire Hazard Mitigation:

House Bill 1110 created a five year program from 2009 to 2014 that allows landowners to deduct the actual costs of their wildfire mitigation, up to \$2,500 from their state income tax. The program allows each landowner to get credit for fifty percent of the cost of wildfire mitigation up to a total of \$2,500. To get the full credit the total mitigation costs must be \$5,000 or greater. The work must be done in accord with an existing Community Wildfire Protection Plan to qualify.

Colorado State forest Service will be administering the program and verifying the actual work completed. This is a good incentive for individual landowners to improve survivable space around their structures. They can get their personal labor recognized at decent hourly rates.

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Table 5: Implementation Items, Priority & Cost

MITIGATION ACTION	PRIORITY	ESTIMATED COST (\$)
Provide FireWise information to all property owners with structures on their land and new property owners and applicants for building permits	1	1,000/ yr
Work with County Commissioners on wildland fire standards for subdivision developments	2	8,000
Conduct one FireWise workshop for WUI residents.	3	800/yr
Provide interested parties with FireWise on site consultations. (@ \$150 each) estimate 50 consults over next 5 years.	4	7,500
Install "No Outlet" signs at the beginning of all dead end roads.	5	60,000
Meet with San Luis Rio Grande Railroad to develop a wildfire prevention and initial attack plan for the railroad ROW.	6	\$1,000
Mow safety zones in the vicinity of _____ and _____ on a bi-annual basis or when grass growth makes it necessary.	7	
Wildland firefighter training for FPD personnel. Get _____ more firefighters qualified as FF2 plus increase qualifications of existing personnel	8	10,000
Purchase 2 Floto-pumps	9	6,000
Develop 2 Fire Wells as available from local farmer ranchers	10	3,000
Thin and mow along WUI evacuation routes	11	
Acquire _____ new handheld radios	12	7,500
Develop turn-arounds on dead end roads that will handle fire apparatus.	13	200,000
Total		

NOTE: The first 4 priorities will best be accomplished via a part time CWPP coordinator.

IV. IMPLEMENTATION & MONITORING

Implementation:

Table 6: Action Plan for Completing the CC CWPP; identifies the responsibilities and tasks necessary to accomplish the job at hand. The priorities and responsibilities have been negotiated and agreed to by Core Team and various named individuals.

The Core Team will

- 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 wildfire prevention attitude in the community.

The CWPP Coordinators roles will be to:

- Strengthen public understanding, acceptance and participation in CWPP operations and improvement projects.
- Ensure follow-up to commitments by the community or within the community and on behalf of the Center FPD goals.
- Facilitate Core Team operations. 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 ensure follow up on all operations and/or activities.

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Table 6: Action Plan for Completing the Costilla County CWPP

MITIGATION ACTION	TARGET DATE	ASSIGNED TO	COMPLETED ü
Provide FireWise information to all property owners with structures on their land and new property owners and applicants for building permits	May 15, 2009 and ongoing	CWPP Coordinator	
Work with County Commissioners on wildland fire standards for subdivision development	9/15/2009	CWPP Coordinator	
Conduct one FireWise workshop for WUI residents	9/15/2009	CWPP Coordinator	
Provide interested parties with on site FireWise consultations. (@150 each) estimate 50 consults in next five years	Ongoing	CWPP Coordinator	
Install "No Outlet" signs at the beginning of each dead end road.	6/2009	POAs	
Meet with San Luis Rio Grande Railroad to develop a wildfire prevention and initial attack plan	12/2009	Emergency Manager & Fort Garland fire department	
Mow Safety zones at	8/15/09	Costilla County Office of Emergency Management	
Wildland firefighter training for FPD personnel. Get ___ more firefighters qualified as FF2	6/15/2009	Fire Chiefs	
Purchase 2 Floto-Pumps	1/2009	Fire Chief	
Mow along WUI evacuation routes.	500 acres/year	POAs	
Add ____ more sets of web-gear and tools to wildland fire cache	4/2009	Fire Chief	
Acquire ____ new handheld radios for	4/2009	Fire Chief	
Develop turn-arounds on dead end roads for fire apparatus.	11/2014	POAs	

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Develop Fire Wells as opportunities present themselves	On going	Fire Chief	

Monitoring:

Monitoring progress is a crucial part of seeing any plan through to completion. Given the values at risk it will be important to assess accomplishments on an annual basis. We expect more homes to become survivable. The Core Team should revisit the CWPP and associated accomplishments every two years and make adjustments to the plan as needed.

Appendices

Appendix A: Maps

Appendix B: Fuel Model Descriptions

Appendix C: Fuel Hazard Reduction Guidelines

Appendix D: Evacuation Planning Guidelines

Appendix E: FireWise – A Homeowners Guide to Wildfire Retrofit

Appendix F: Fuelbreak Guidelines for Forested Subdivisions & Communities

Appendix G: Road & Driveway Specifications for Emergency Access

Appendix H: Costilla County Triage

Appendix I: Subdivision Hazard Evaluation Form

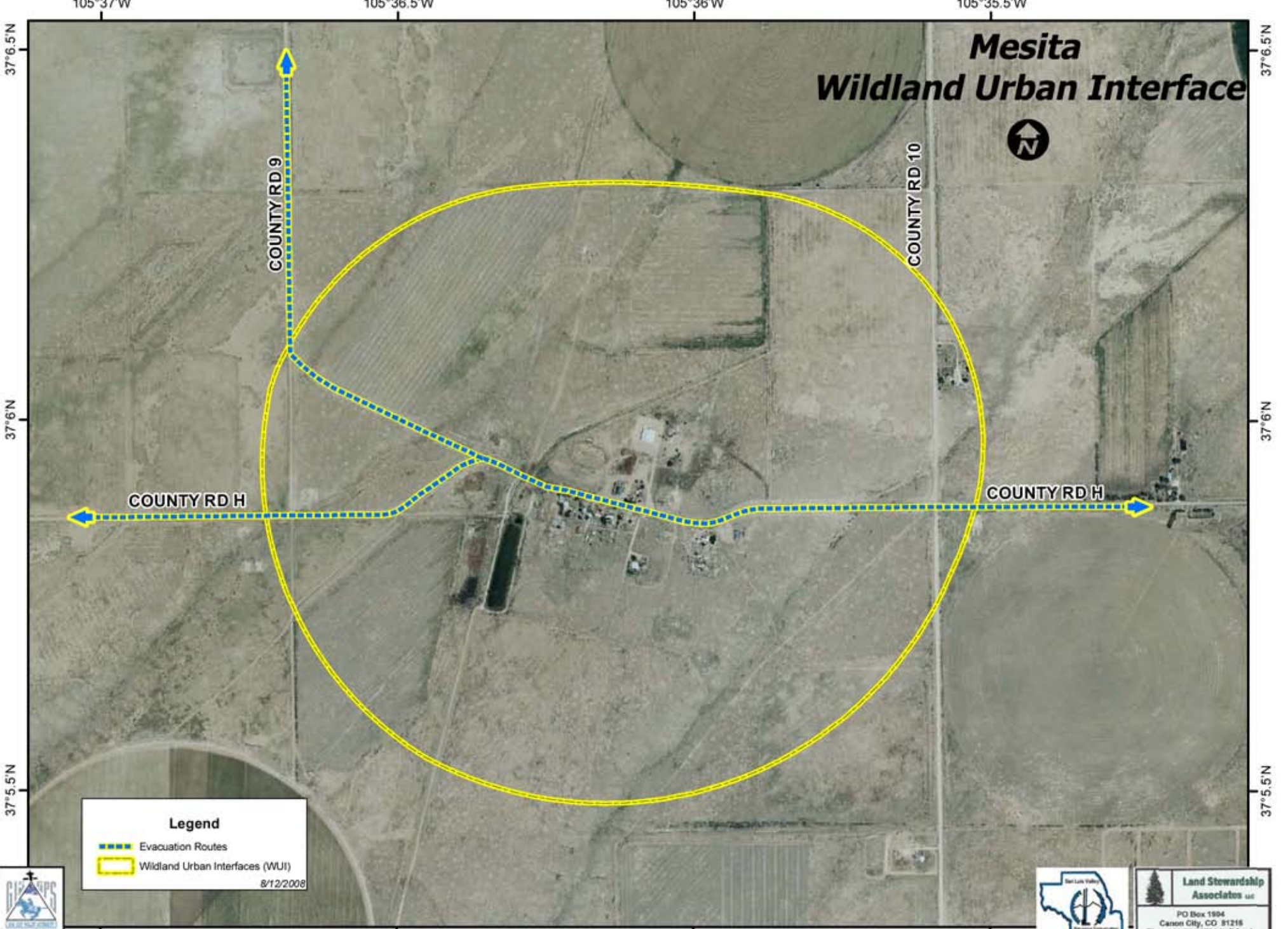
Appendix J: Definition of Terms

Appendix K: References and Publications

Appendix L: CC Core Team Meeting Notes

Appendix M: Forbes Wagon Creek Ranches CWPP

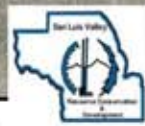
Mesita Wildland Urban Interface



Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)

8/12/2008



Land Stewardship Associates LLC

PO Box 1904
Canon City, CO 81216
Ph: 1-888-721-0704 (toll free)
www.landsteward.com

NOTE: Coordinate pairs in Degrees and Decimal minutes

0 500 1,000 2,000 3,000 4,000 Feet

105°35'W

105°32.5'W

105°30'W

San Acacio Wildland Urban Interface



San Acacio

COUNTY RD 12

COUNTY RD 13

142

142

COUNTY RD 12

37°12.5'N

37°12.5'N

Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)

8/13/2008



105°35'W

105°32.5'W

105°30'W

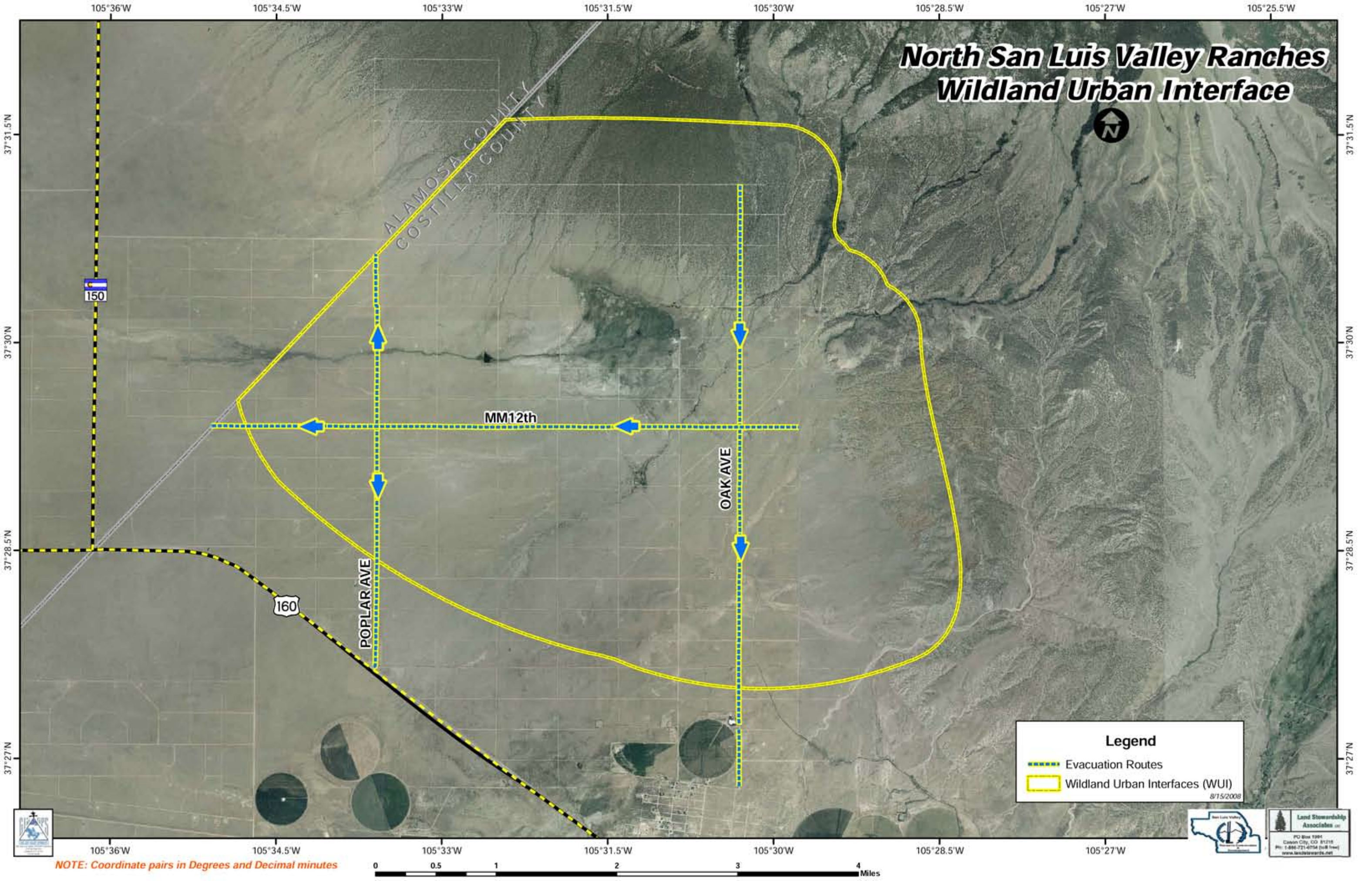
NOTE: Coordinate pairs in Degrees and Decimal minutes



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North San Luis Valley Ranches Wildland Urban Interface



Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)

8/15/2008

NOTE: Coordinate pairs in Degrees and Decimal minutes



Land Stewardship Associates, Inc.
PO Box 1994
Canon City, CO 81215
Ph: 1-888-721-4754 (toll free)
www.landsteward.com

105°27'W

105°26'W

Fort Garland Wildland Urban Interface



37°26'N

37°26'N

37°25'N

37°25'N

Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)



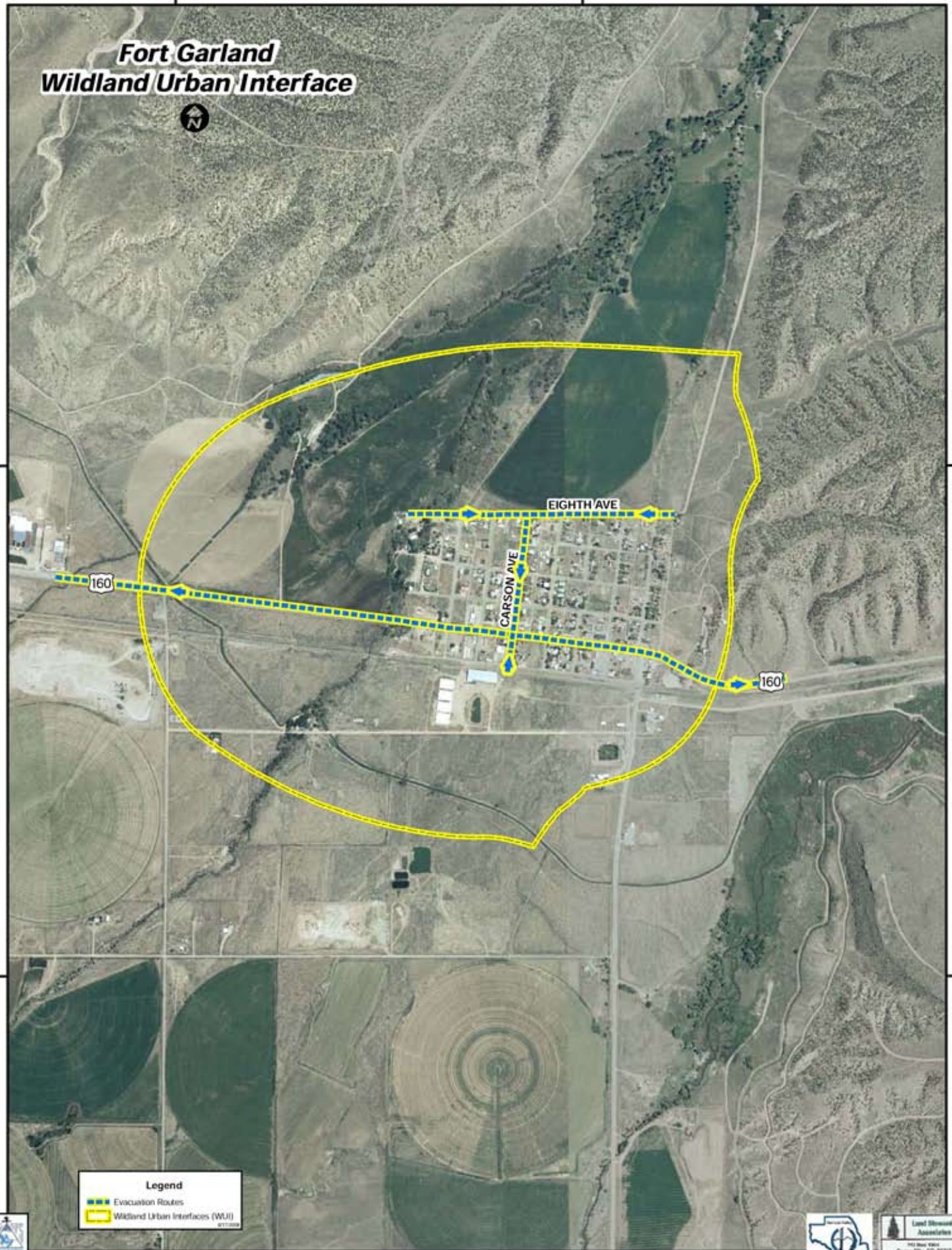
Land Ownership
Association

700 West Street
Canon City, CO 81201
Ph: 719.253.4414 (ext 200)
www.landowners.org

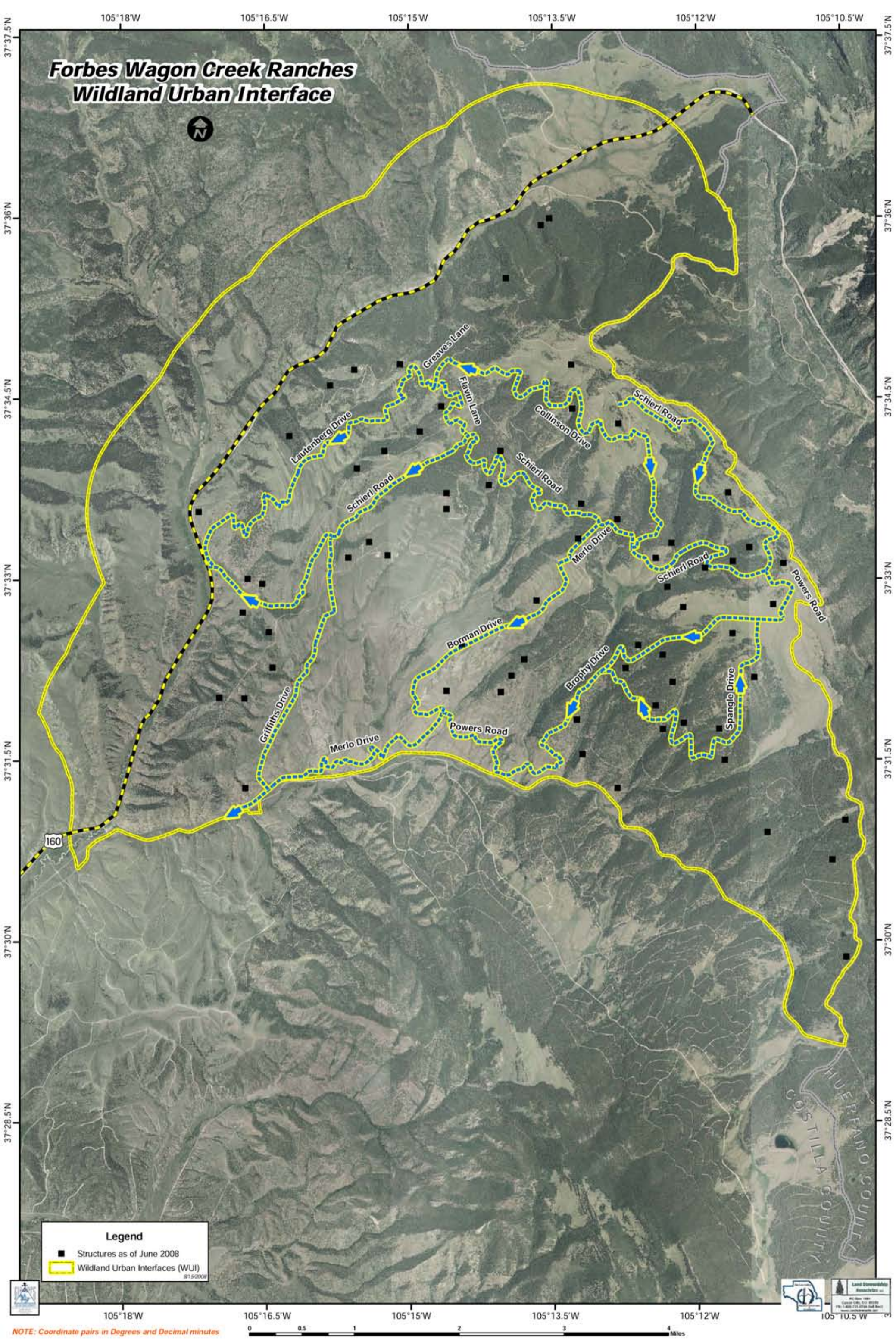
105°27'W

105°26'W

NOTE: Coordinate pairs in Degrees and Decimal minutes



Forbes Wagon Creek Ranches Wildland Urban Interface



Legend

- Structures as of June 2008
- ▭ Wildland Urban Interfaces (WUI)

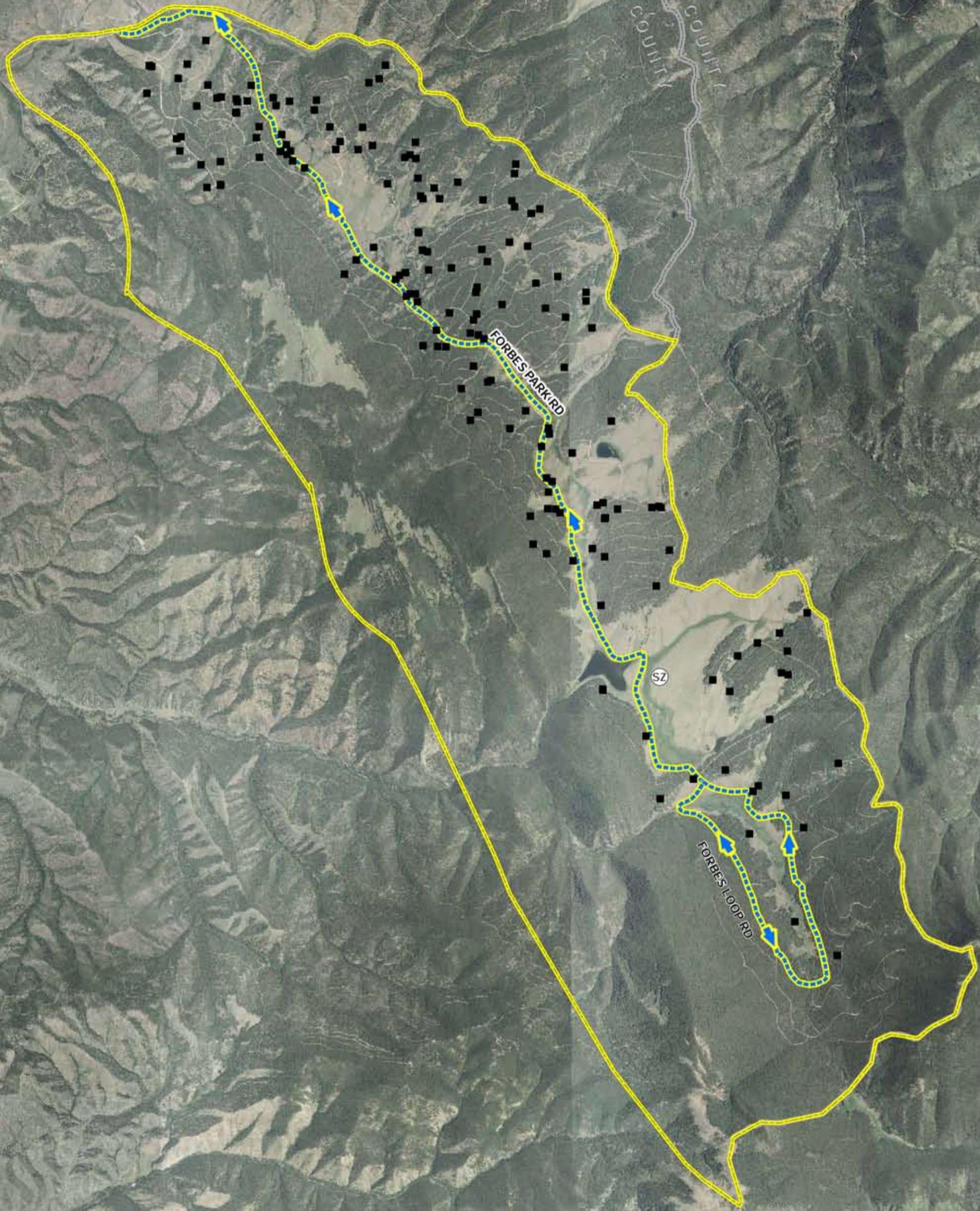
8/15/2009

Land Ownership
8/15/2009
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Forbes Park Wildland Urban Interface



Legend

- Safety Zone
- Evacuation Routes
- Wildland Urban Interfaces (WUI)

#15/2008

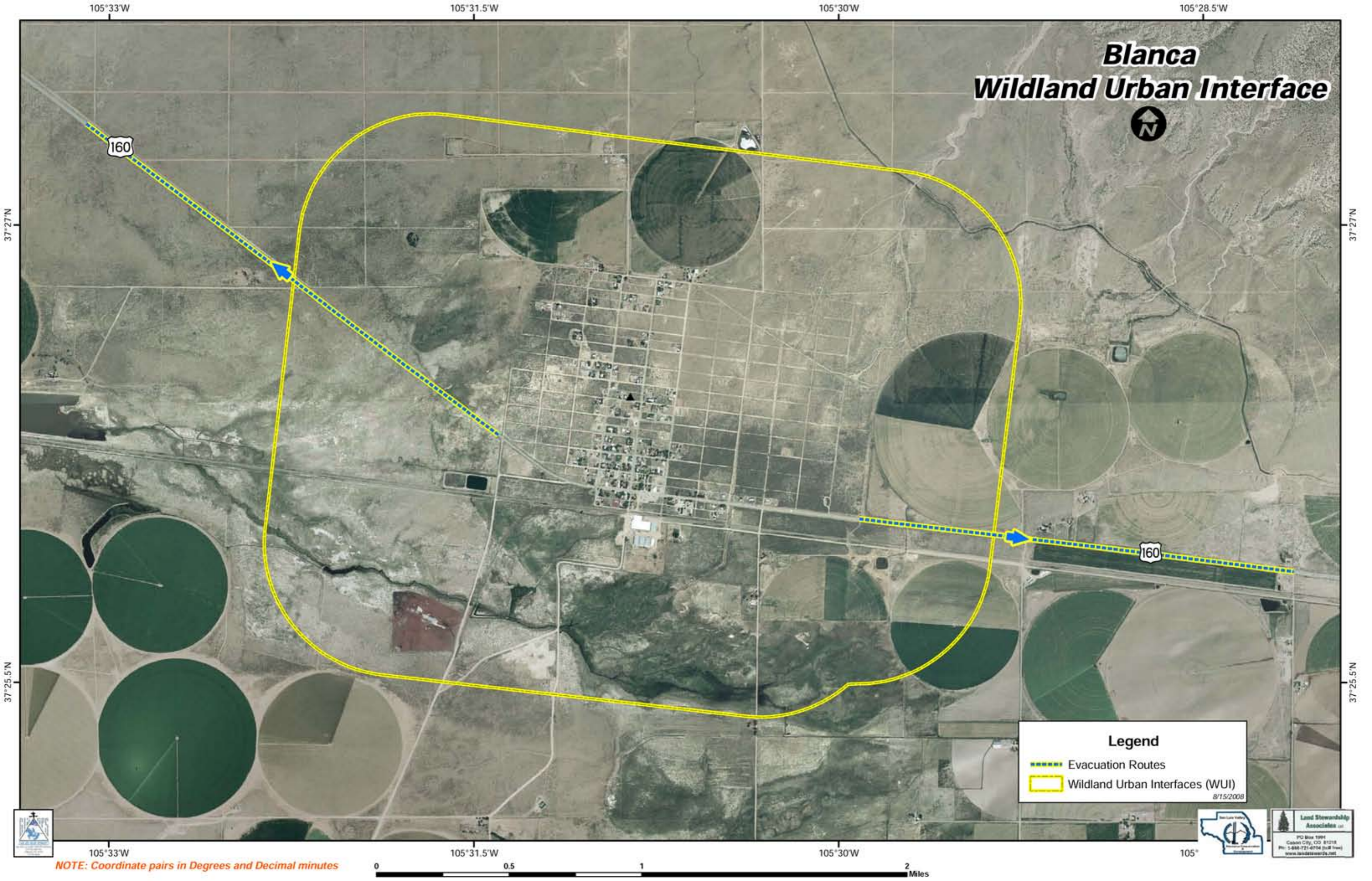


Land Ownership Association
Cannonville, UT 84703
Ph: 435.733.4344
www.landowners.org

NOTE: Coordinate pairs in Degrees and Decimal minutes



Blanca Wildland Urban Interface

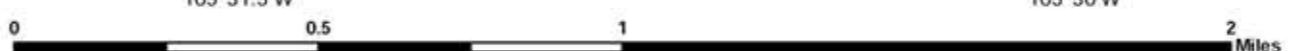


Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)

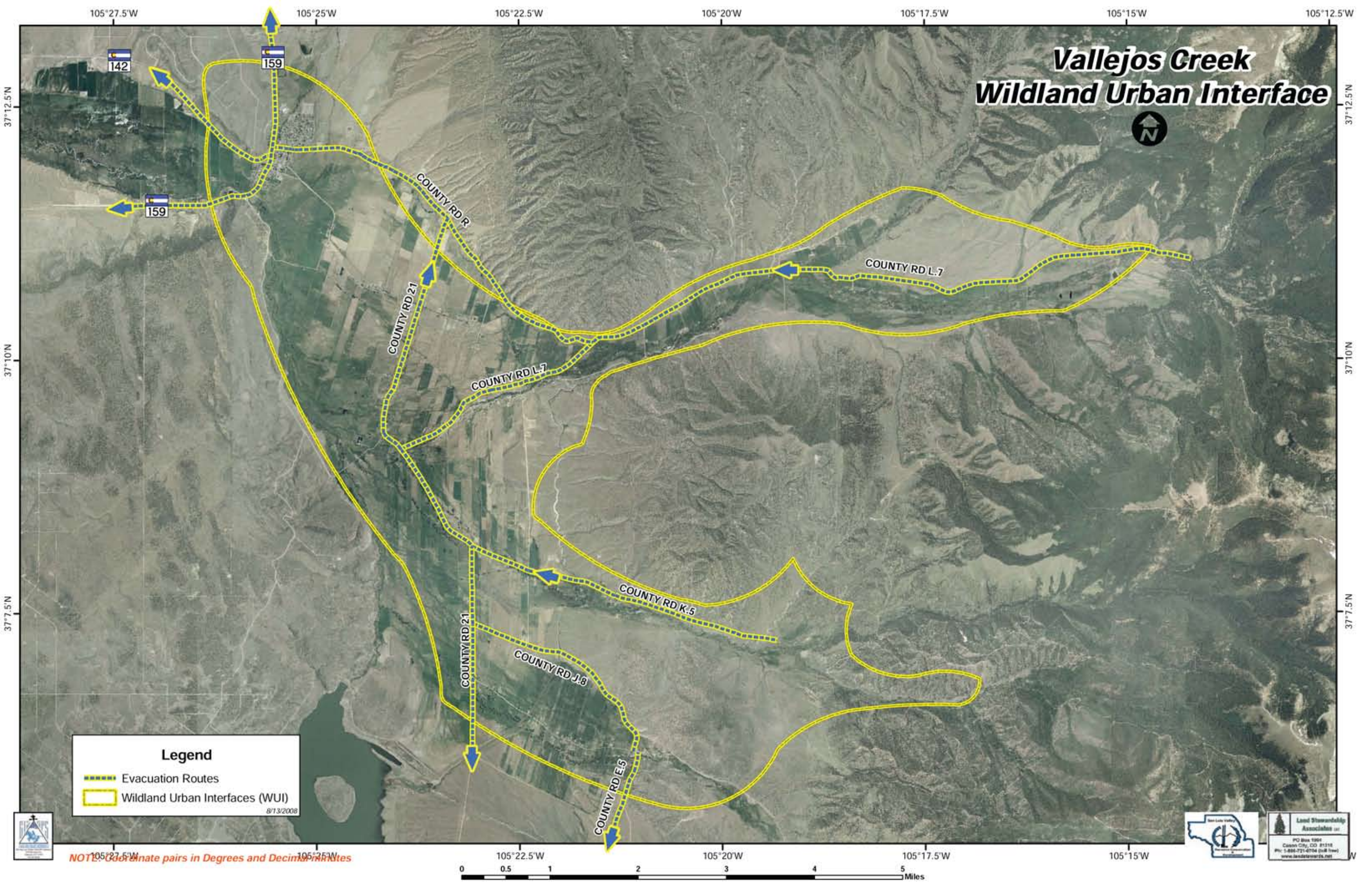
8/15/2008

NOTE: Coordinate pairs in Degrees and Decimal minutes



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www.landsteward24.com

Vallejos Creek Wildland Urban Interface



Legend

- Evacuation Routes
- ▭ Wildland Urban Interfaces (WUI)

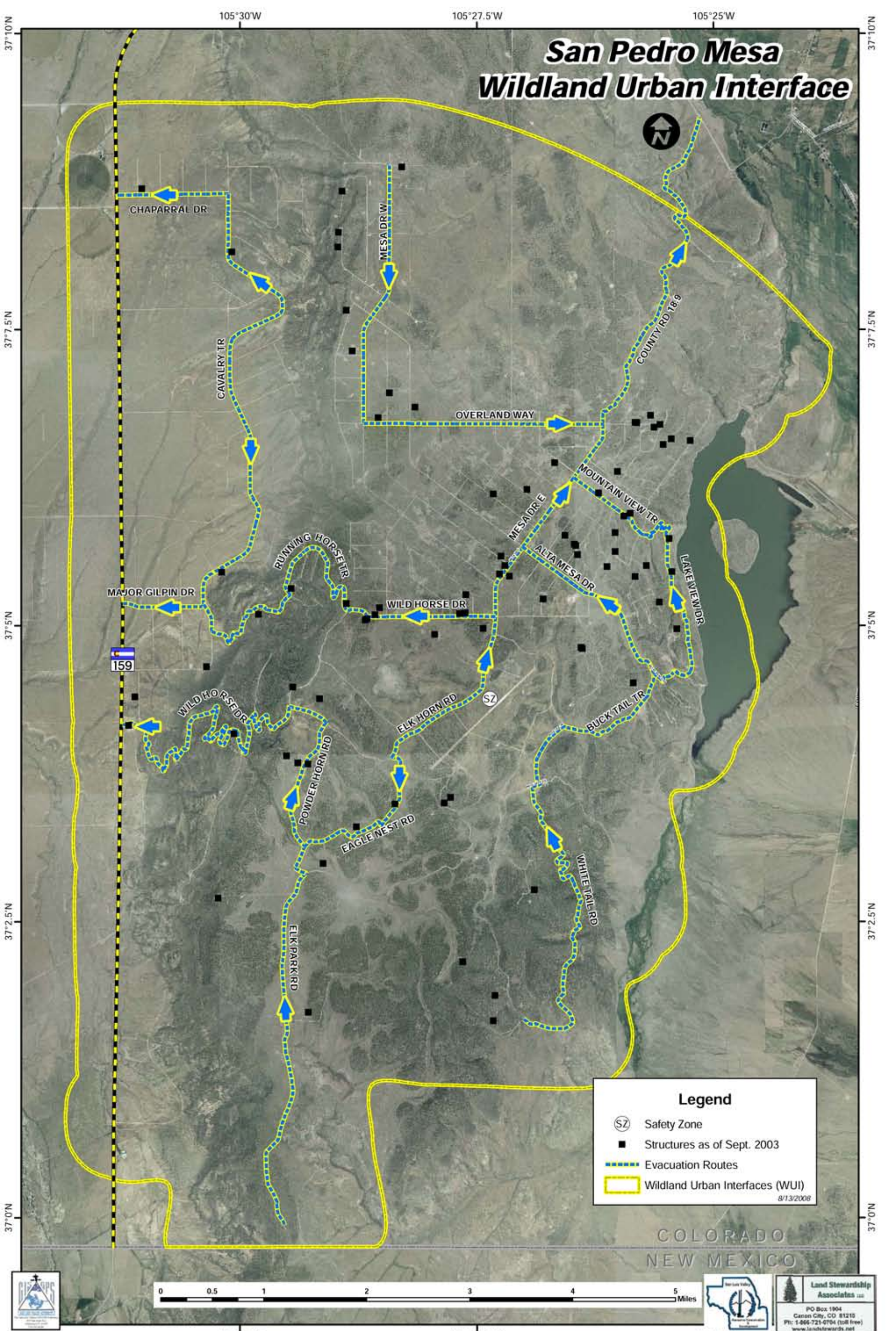
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NOTE: Coordinate pairs in Degrees and Decimals



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San Pedro Mesa Wildland Urban Interface



Legend

- Safety Zone
- Structures as of Sept. 2003
- Evacuation Routes
- Wildland Urban Interfaces (WUI)

8/13/2008

COLORADO
NEW MEXICO

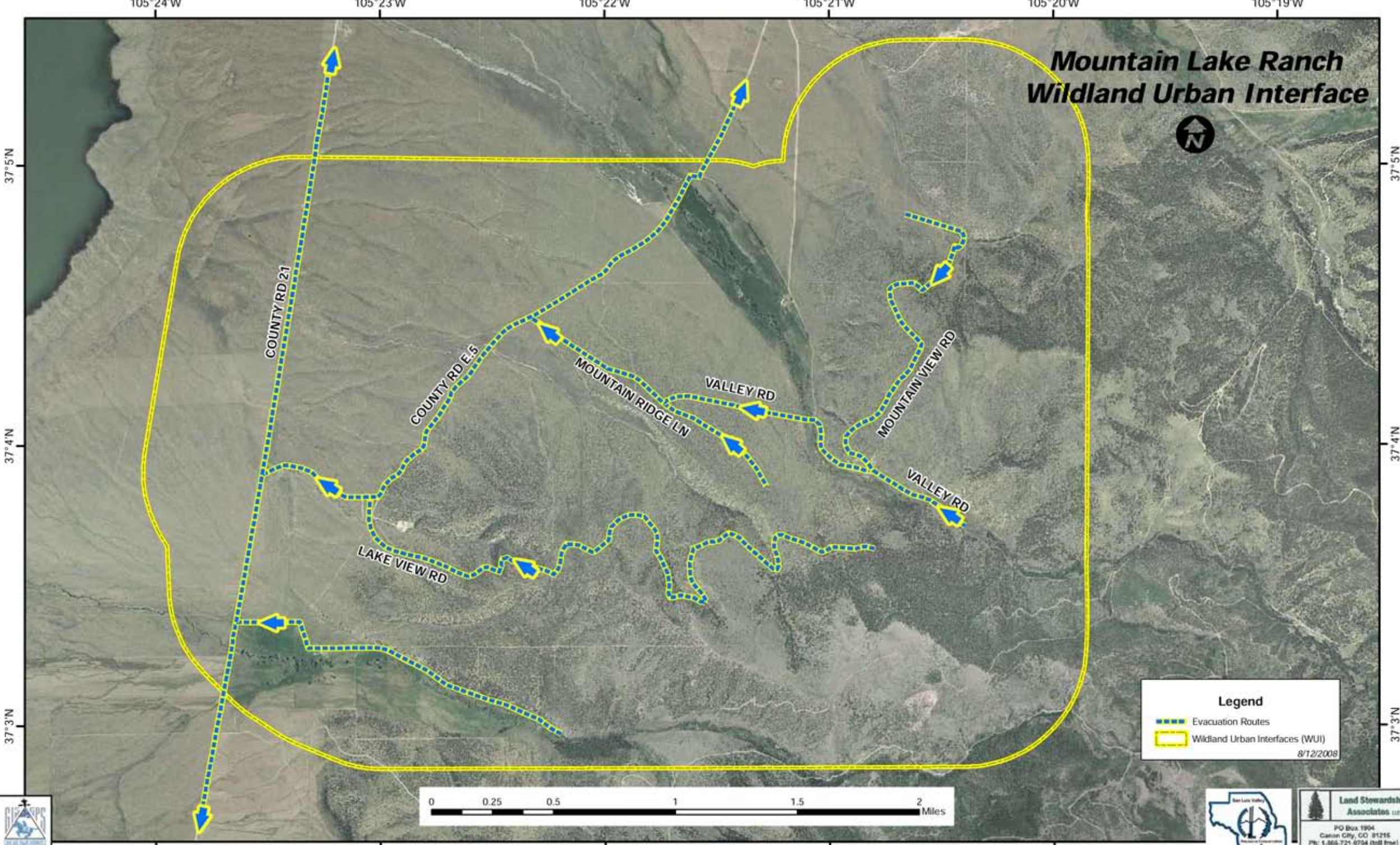


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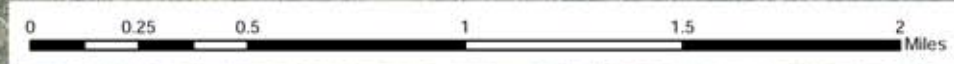
Mountain Lake Ranch Wildland Urban Interface



Legend

- Evacuation Routes
- Wildland Urban Interfaces (WUI)

8/12/2008

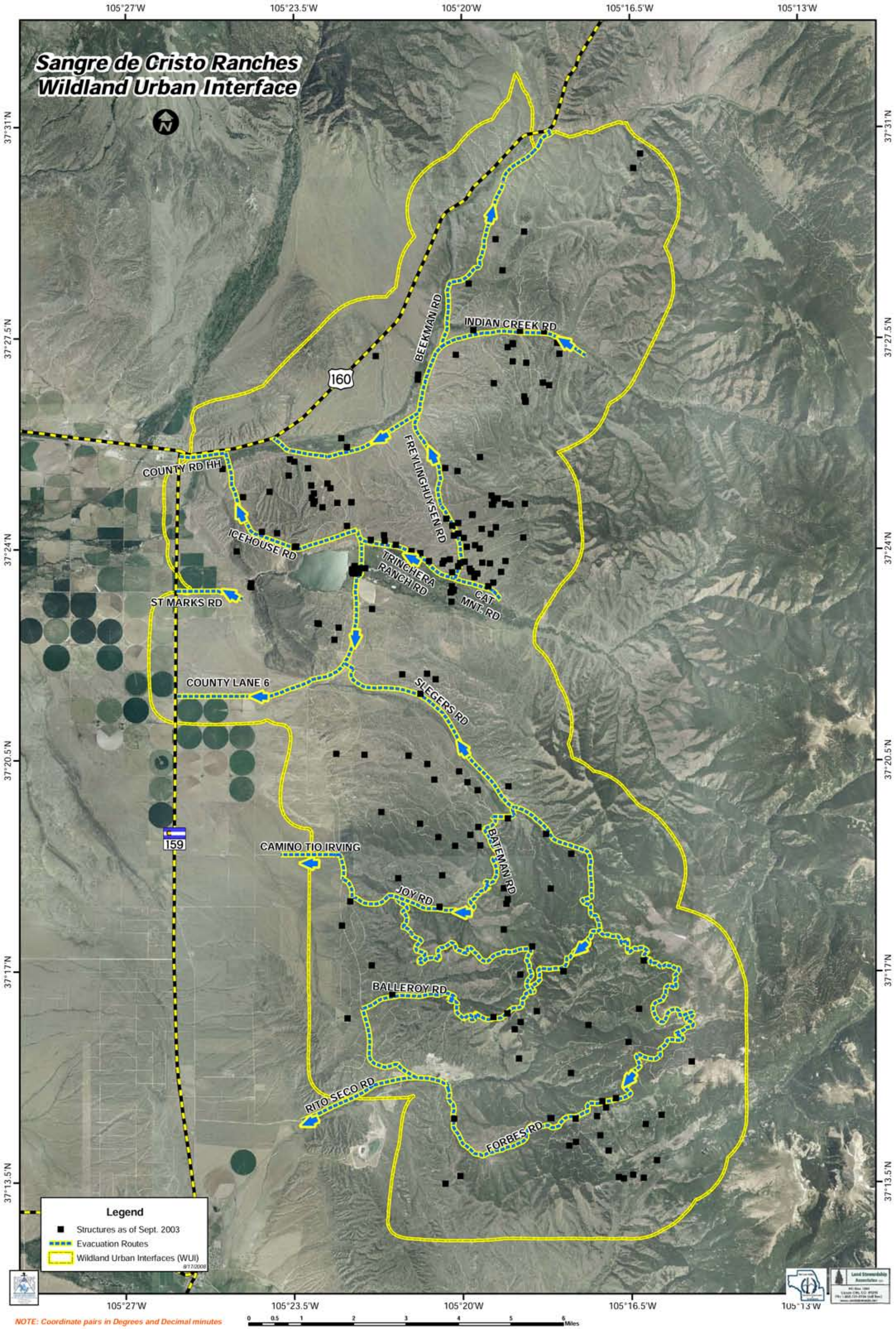


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NOTE: Coordinate pairs in Degrees and Decimal minutes

Sangre de Cristo Ranches Wildland Urban Interface



Legend

- Structures as of Sept. 2003
- Evacuation Routes
- ▭ Wildland Urban Interfaces (WUI)

8/17/2009

NOTE: Coordinate pairs in Degrees and Decimal minutes

