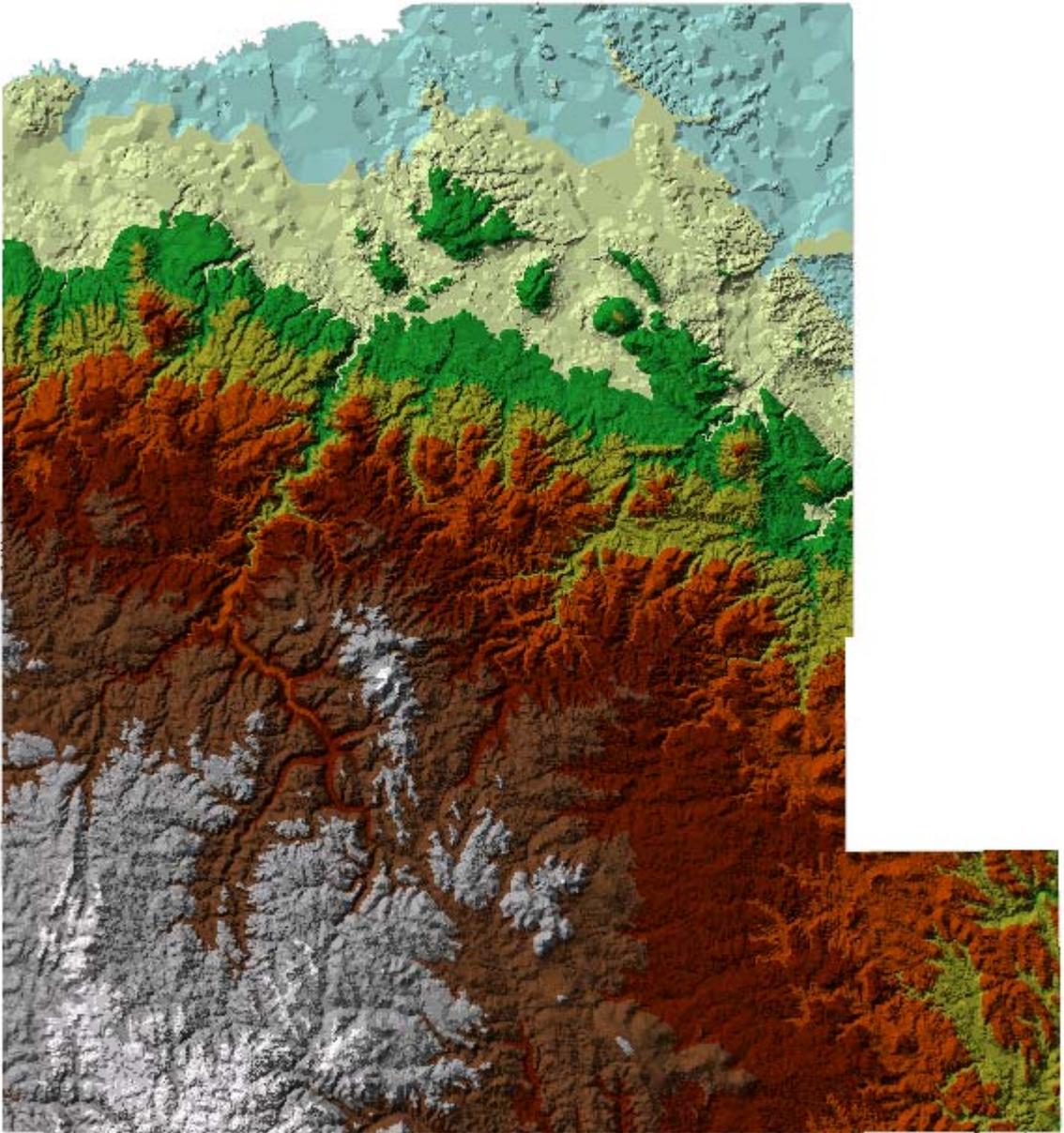


# Lawrence County Community Wildfire Protection Plan



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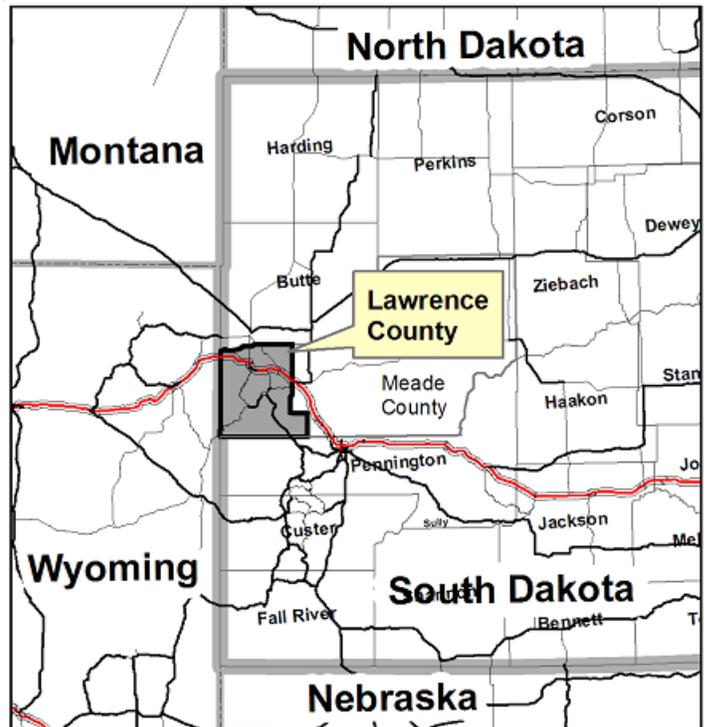
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## Community Discussion

The principal objective of this community wildfire protection plan is to reduce the risk from wildfire to life, property, critical infrastructure and natural resources in Wildland Urban-Interface areas of Lawrence County. The Wildland Urban-Interface, (WUI), is a set of conditions that exist when structures and other human development meet or intermingle with wildland or vegetative fuels. The USDA Forest Service in conjunction with the USDI Bureau of Land Management identified a list of communities and placed them in the Federal Register. These communities are in the WUI areas and in the vicinity of federal lands that have been identified as being at high risk from wildfire. Other areas of Lawrence County are also at high risk from wildfire including, but not limited to, the communities identified in the Federal Register. A *community* is a group of people living in the same locality and under the same government. Everyone living in Lawrence County should be eligible to receive the same consideration and benefits as the people that are identified in the Federal Register if they live in the WUI and are at risk from wildfire. Data from the 2000 census indicates there are a total of 21,802 people in Lawrence County. The average population per household is 2.33 persons.

Lawrence County is located in the northern portion of the Black Hills in western South Dakota. The total area of the county is approximately 800 square miles or 511,940 acres. There are 4 primary landowners within Lawrence County, which include: Private, State, USDI Bureau of Land Management and USDA Forest Service. The private property is scattered across the entire county consisting of



agricultural/range land, mining claims, residential and commercial and historical property. There are approximately 229,060 acres of private property in Lawrence County. The Bureau of Land Management manages approximately 5,220 acres within the exemption area, (See page 7). There is also state land consisting of game production areas, fish hatcheries, and lakes and streams. There are approximately 4,335 acres of state owned land in Lawrence County. There are approximately 273,335 acres owned by the United States Department of Agriculture in Lawrence County known as the Black Hills National Forest.

Wildfire doesn't recognize property boundaries and the occurrence of fire crossing these boundaries is a common occurrence. Cooperation between all agencies is important to reduce the risk from wildfire. Sharing information and developing plans will enhance effectiveness of wildfire mitigation. Firefighter and public safety is the number one priority. Reducing the risk to values

from all hazards is an important concern for all the stakeholders in Lawrence County.

### **The Healthy Forest Restoration Act**

The Community Wildfire Protection Plan, (CWPP), concept is outlined in the Healthy Forest Restoration Act, (HFRA), of 2003. This Act provides the basis to encourage and allow comprehensive community-based forest planning and the prioritization of fuel reduction and other vegetative management projects. This legislation includes statutory incentives for the USDA Forest Service and the USDI Bureau of Land Management to give consideration to these priorities and planning suggestions set out in individual Community Wildfire Protection Plans.

The HFRA, builds on the National Fire Plan and the Ten Year Comprehensive Strategy for Reducing Wildland Fires Risks to Communities and the Environment in establishing an expectation that federal land management agencies will work with communities and local governments to reduce fire and forest health risks within and around WUIs and communities at risk . The HFRA specifically encourages efforts to restore healthy forest conditions by authorizing expedited environmental assessments, administrative appeals, and judicial review for hazardous fuels projects on federal land, and gives preference in the use of these authorities to agencies who partner with communities in a collaborative fashion.

The HFRA specifically requires that the federal government work collaboratively with local communities that have prepared a CWPP. This is particularly important in Lawrence County since the federal government owns over 50% of the County. With such a large area controlled by the

federal government, collaborative landscape vegetative planning is absolutely necessary to effectively protect the WUIs and communities at risk within Lawrence County.

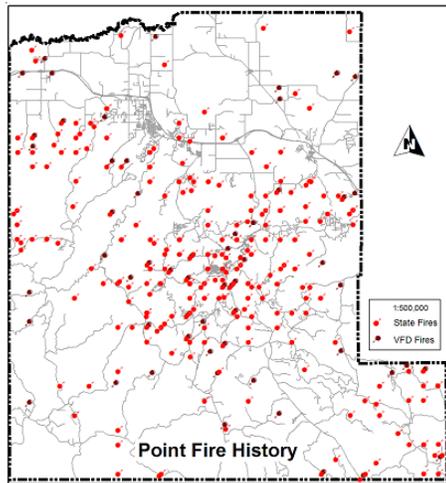
A CWPP may provide communities with a tremendous level of influence over where and how federal agencies implement fuel reduction projects on federal lands and how additional federal funds may be distributed for projects on non-federal lands. Federal agency leadership has also clearly indicated that fiscal resources appropriated for the preparation and implementation of HFRA projects will be preferentially distributed to areas where CWPPs have been completed.

The National Environmental Protection Act, (NEPA), also supports this collaborative planning by allowing local governments where they provide special expertise to cooperate with the federal government on NEPA projects. In many areas Lawrence County has this special and unique expertise that would provide the federal government with valuable input in planning and prioritizing vegetative treatments. Where desired by the County the USDA Forest Service and/or USDI Bureau of Land Management should give the county, cooperating agency status on vegetative projects that are planned to be implemented in the County.

### **Fire History**

There have been 61 fires extinguished by volunteer fire departments in Lawrence County in the past 4 years. There have been 289 fires recorded and suppressed by fire suppression crews in the past 44 years. All of these fires range from .01 acres to 11,000 acres. Many of

the fire records for the past 100 years are not accurate or the data is incomplete. Many large fires have names, acres burned and possibly an ignition point but no specific perimeter, severity data, fuel or weather



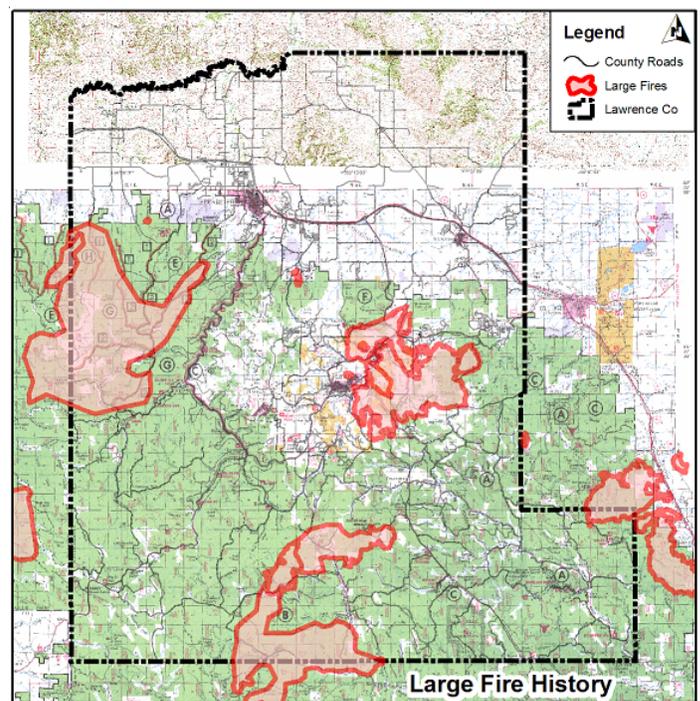
conditions during the event. The fire history data was acquired and analyzed by the South Dakota Department of Agriculture Wildland Fire Suppression Division for this plan in 2002.

The following list of large fires was compiled from USDA Forest Service, State of South Dakota and local knowledge. These fires all burned within Lawrence County. There are particular years that fire

activity was much more severe; 1890, 1911, 1931, 1959 and 2002 show more activity and more acres burned. Many fire scars, from the 1930's on, were still evident on a 1973 land satellite image. This could indicate that some of these fires burned very intensely and caused stand mortality to a majority of the acres burned. These years of higher fire activity may have had dryer conditions prior to and during the fire season and fire weather during the burn period that may have caused increased fire severity. Fire history in the northern Black Hills burned more frequently but with much less intensity. This resulted in a more open savanna type condition with widely spaced stands of mature Ponderosa Pine. Indications show pre-settlement forest stand density levels may have typically been 30-40 mature trees per acre. This would generally provide 15-20 feet of separation between the canopies. The greater amount of acres burned annually helped the ground fuel from accumulating into dense fire prone fuel conditions. Timber litter or surface loads were maintained at lower levels by naturally

#### Large Fire History

NAME	YEAR	ACRES	CAUSE
1. Grizzly Gulch	2002	11,000 acres	Unknown
2. Beaver	2001	50 acres	Lightning
3. Maitland	2000	75 acres	Lumbering
4. Deadwood	1959	4,501 acres	Debris burning
5. Nemo	1959	273 acres	Power line
6. Dry Lake	195?	282 acres	Unknown
7. Big Elk	1949	6,630 acres	Smoker
8. Buskala	1947	2,200 acres	Smoker
9. Galena Mill	1937	1,181 acres	Lumbering
10. Black Fox	1934	635 acres	Lightning
11. Rochford	1931	21,640 acres	Incendiary
12. Lost Gulch	1931	1,079 acres	Smoker
13. Whitewood Canyon	1917	600 acres	Railroad
14. Sterns Park	1914	500 acres	Unknown
15. Sheep Mountain	1911	320 acres	Unknown
16. Tilly	1911	600 acres	Hunter
17. Thein	1911	300 acres	Lightning
18. Thein #2	1911	640 acres	Unknown
19. Smith Peak	1911	1,280 acres	Unknown
20. Haka	1911	1,840 acres	Burning brush
21. Galena	1908	2,000 acres	Unknown
22. Iron Creek	1899	38,400 acres	Unknown
23. Roubaix	1893	1,111 acres	Unknown
24. Two Bit	1894	2,000 acres	Unknown
25. Dumont	1890	3,000 acres	Unknown
26. Savoy	1890	1,000 acres	Unknown
27. Iron Creek	1890	38,000 acres	Unknown



occurring ground fires. The dead litter and vegetation regeneration were not given a chance to form the vertical continuity that fire requires to get off the ground and into the forest canopy thus maintaining less intense fires.

### **Fire Regime Condition**

The fire regime condition classes are qualitative measures describing the degree of departure from historical fire regimes. Alterations of key ecosystem components such as species composition, structural stage, stand age, stand density, canopy closure and fuel loads may result from departure of historic conditions. One or more of the following may have caused this departure: fire suppression, timber harvesting, livestock grazing, introduction and establishment of exotic plant species, insects or disease or other past management activities.

The USDA Forest Service, data classifies the Black Hills National Forest historical fire regime as low intensity, with high frequency. This means that a historical fire frequency was 35-years or less and that fires generally burned at low intensities and low to moderate severities. Condition classes range from 1-3 where a rating of 1 means that the forest environment is not at risk of losing any major components or at risk of significant change of one or more of its major ecosystem components. A rating of 3 indicates that the forest area is at high risk of significant change on one of those components. An easy indicator of condition class is to count the number of fire return intervals or frequency intervals missed. Generally speaking, if an area has missed 3 or more frequency return intervals then the stand is at high risk of significant change. The USDA Forest Service data

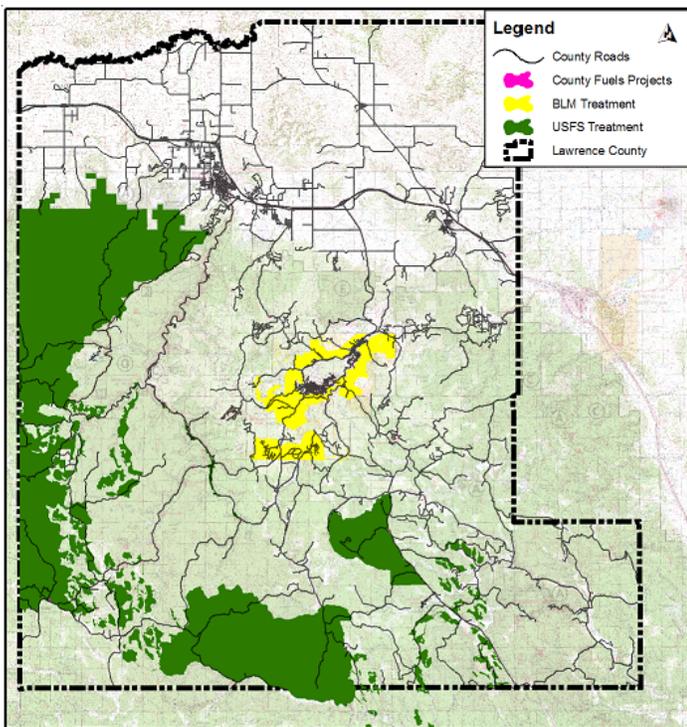
identifies the Black Hills National Forest to be in a Condition Class 3.

Fire regime condition classes in Lawrence County have been significantly altered from the historical range. The risk of losing key ecosystem components is high. Fire frequencies have departed from historic frequencies by multiple return intervals. This has resulted in dramatic changes to one or more of the following: fire size, intensity, severity and landscape patterns. Vegetation attributes have been significantly altered from their historic range. The structure and orientation of fuels in Lawrence County vary tremendously. Some areas have had fuels reduction projects done in recent history; other areas have not. Areas that have had some type of fire or fuels activity may have less hazardous fuels than areas that have not had any vegetation management in many years.

### **Agency Projects**

Lawrence County has a very unique area known as the Exemption Area. Approximately 22,520 acres were exempt from the Black Hills National Forest in 1896 when the forest was designated. The ownership of the area was so intermingled with mining claims and other ownership that the area was excluded from the National Forest. The USDI Bureau of Land Management now manages public lands within the exemption area. The USDI Bureau of Land Management is currently conducting a fuels reduction program on 2,675 acres of public land within the exemption area. This program identified 11 WUI areas and a 50-mile network of fire containment zones to provide fire suppression crews a safer and more effective area to work within.

The Mineral Forest Management project, in progress by the USDA Forest Service identified 9,100 acres for treatment activities. These treatment areas are in close proximity to Lead, Deadwood, Terry Peak, Cheyenne Crossing, Dear Mountain and Englewood. 5,650 acres of Forest Service land will be treated. Specific forest conditions will be modified by increasing forest diversity and will benefit wildlife habitat and scenic resources. Reduce pine encroachment to enhance meadow vegetation and reduce pine canopy to maintain or enhance Quaking Aspen.



Current stands that may contribute to forest-fire hazard will be treated to reduce fire hazard by changing the type, amount or arrangement of potential fuels. In addition, non-commercial treatments near private property would further reduce fire hazards. Thinning to lower stand densities could be expected to improve forest health by reducing the risk from insects including the Pine Engraver and Mountain Pine Beetle.

The Elk Bugs and Fuels Project will encompass approximately 45,498 acres of

National Forest land and 15,068 acres of interspersed, private and state lands. Due to the increase of Mountain Pine Beetle activity and storm-damaged trees across much of the analysis area, there has been a large increase of fuel loading, which may affect potential wildfires. Current fuel conditions will possibly create wildfire activity that could overwhelm fire suppression forces in the event of catastrophic wildfire. Treatments involved in the project will be commercial and non-commercial hard wood restoration, commercial and non-commercial thinning of conifers and some prescribed fire.

The South Dakota Wildland Fire Suppression Division is currently managing a hazardous fuels reduction program that provides a 50/50 cost share program for private landowners that are interested in reducing hazardous fuels. This program focuses on the survivable space around structures. They also have another program that provides 100% funding for hazardous fuels reductions in areas that surround communities in WUI zones. The intent of this program is to reduce fire intensity and provide values at risk a better opportunity to survive wildfire.

The state of South Dakota currently has a Forest Land Enhancement Program that provides additional financial assistance to State Foresters to encourage the long-term sustainability of non-industrial private forestlands. This State Priority Plan outlines policies, priorities and procedures necessary to accomplish the program objectives. The Forester of the South Dakota Department of Agriculture, Resource Conservation and Forestry Division, in coordination with the Forest Stewardship Coordination Committee has developed this plan. The systems

provided under this plan would complement rather than replace or duplicate any existing state and/or federal programs. This plan can be revised as necessary and will continue until all the program funds have been expended.

3. Advertise the Forest Land Enhancement cost-share program to ensure landowners are aware of the availability of the program.
4. Forest landowner education.

The objectives of the state plan include:

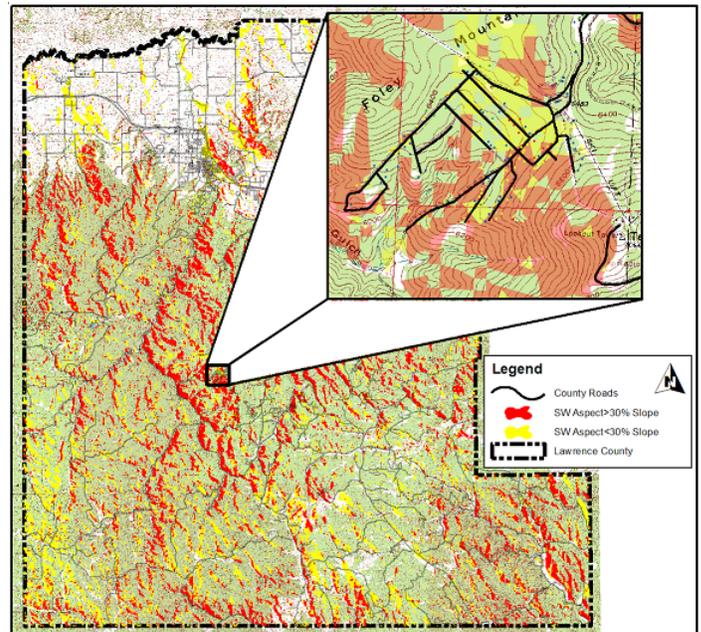
1. Invest in practices that establish, restore, protect, manage and enhance the health and productivity of Non-industrial Private Forest lands in South Dakota for timber, flora, fauna, soil, water quality, air quality, wetland buffers, and riparian buffers.
2. Enhance and sustain the long-term productivity of timber and non-timber resources through afforestation, reforestation and timber stand improvement.
3. Reduce the risk, and help restore, recover, and mitigate the damage caused by a fire, insects, invasive species, and damaging weather.
4. Enhance carbon sequestration opportunities.
5. Enhance implementation of agroforestry practices.
6. Maintain and enhance the ForestLand base.
7. Preserve the aesthetic quality of Non-industrial private forestlands.

The four objectives to the educational portion of the state program will be:

1. Develop, print and distribute brochures and fact sheets explaining the Forest Land Enhancement Program.
2. Design and maintain a web page on the South Dakota Resource Conservation and Forestry Division.

## Topography

The topography of Lawrence County must be considered when mitigating for wildfire. The following slope and aspect values were derived from a digital elevation model of Lawrence County. The shape of the country can influence the intensity and spread of wildland fire. Slopes with south or west aspects will become drier and the fuels will cure earlier in the season. There



are 5,203 acres in Lawrence County on a slope of more than 30% with a south or west aspect. 741 of these acres are on private land. Topography alters the normal heat transfer process and modifies the general weather patterns, producing localized weather conditions that influence fire behavior. Fires starting at the base of slopes become larger and more intense because of availability of up-slope fuels. As slope increases, rate of spread and flame lengths also increase. The

topographic configurations of narrow canyons pose dangerous conditions that Shout “Watch Out” for fire suppression crews. The fuels on these slopes are also preheated from the sun and may produce more erratic fire behavior. Down slope areas adjacent to structures need to increase the amount of survivable space to provide additional protection to these values from wildfire. We cannot control when or where fire will occur but with proactive planning and preparedness we may be able to lessen the impact it has on life, property and resources.

### **Weather**

Current weather patterns that are creating drought conditions in Lawrence County may be contributing to the risk from wildfire. The overall climate of the Black Hills area is continental, which is characterized generally by low precipitation, hot summers, cold winters and extreme variations in both precipitation and temperatures. Local climatic conditions are affected by topography, with generally lower temperatures and higher precipitation at the higher altitudes. Research indicates that historically there have been long durations of drought and wet periods dating back as

far as the 1600’s. Long periods of drought directly affect tree mortality, insect activity and possibly contribute to more severe fire behavior.

During fire season in western South Dakota, when the winds are from the south the temperatures are usually higher and the relative humidity is usually lower. These conditions are conducive for fires to easily become large conflagurations that are hard to manage. Large fires also occur that are wind driven events. The spread rate and direction vary according to predominant wind direction, topography, fuel conditions and relative humidity.

### **Water Sources**

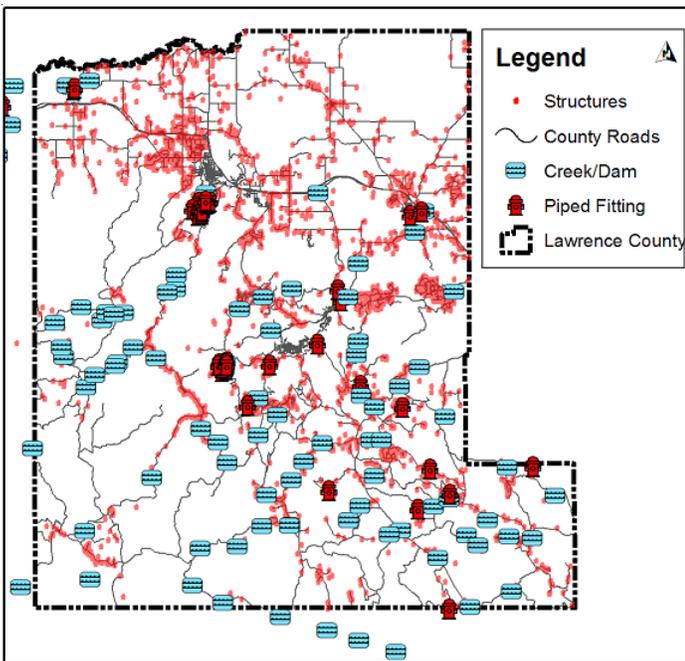
The municipalities of Lead, Deadwood, Central City, Pluma, Spearfish, Whitewood and St. Onge all have pressurized water systems with hydrants. The water sources in the rural areas of Lawrence county are limited to dry hydrants, creeks and dams. Water sources should be developed to provide a usable water supply for fire suppression crews. The water source should be signed and clearly indicate the extent of the source and how it is supplied. Standardized fire hose fittings should be used to accommodate fire apparatus. There have been 138 water sources mapped in Lawrence County. These do not include the hydrants in the municipal water systems, with the exception of that a few hydrants on the edges of the cities are included. Due to continued drought conditions some water sources may be inadequate for fire suppression activities.

Water sources should be created for the purpose of fire suppression and fire-fighting agencies should be made aware of the locations and amount of water on



hand and how these sources are maintained. Many areas in Lawrence County may not have readily available water sources for fire suppression and this could greatly impact fire suppression activities. Water sources will be mapped and information will be documented about these sources. This information will be available to fire departments for suppression activities.

The municipalities of Lead, Deadwood, Central City and Pluma all use a common water source. The Homestake Mining Company developed this water source over 100 years ago. It consists of a series of collection sites south and west of the city of Lead, some as far away as 10



miles. The majority of the system is gravity fed with only one lift station. The watersheds that feed this collection system are comprised of private and federal land with a total of 34,160 acres. Large amounts of ash and sediment could cause failure of the collection system by clogging transportation pipelines and other adverse effects. The majority of the transportation system is underground in clay tile pipes. There are a few structures that are above

ground that also need consideration; one of these is the Reno Bridge that is a steel structure with a redwood flume that carries 100% of the water to the municipalities. A fuels reduction project was preformed at this location in 2004 in a collaborative effort between the USDI Bureau of Land Management, City of Lead, the State of South Dakota and Lawrence County. This project will help insure this important infrastructure is more prepared to survive a wildfire event.

### Risks

The risk of wildfire occurring in Lawrence County is evident based on the fire history within the County. Ignitions have occurred from railroads, vehicles, lightning, sawmills, burning debris, power lines, incendiary, and other human caused events. Lawrence County has seen a large amount of rural development over the past several years. These areas are typically smaller tracts of land that are being broken up into subdivisions for individual development. Considering the increasing number of people living in WUI areas, mitigating the risk from wildfire must be a priority. Utilizing better community planning of WUI areas, using Firewise choices to preserve life and property, updating fire suppression apparatus and by utilizing public education we can possibly decrease the potential risk from wildfire. It is not a matter of “if it burns, but when it burns”. Heightened awareness of current forest condition verses historical forest conditions may help people become aware that we need to work toward getting the forest back into a more natural condition. Reducing the risk from wildfire by lowering fire intensities can help save lives, property and resources.

Structure density should also be considered when reducing the risk from wildfire. A structure burning inside of another structure’s survivable space adds to the overall intensity and spread of a wildfire. In many cases structure after structure are consumed by fire and the natural vegetation does not burn. In these cases it is the urban fuels that are supporting the spread of the wildfire.

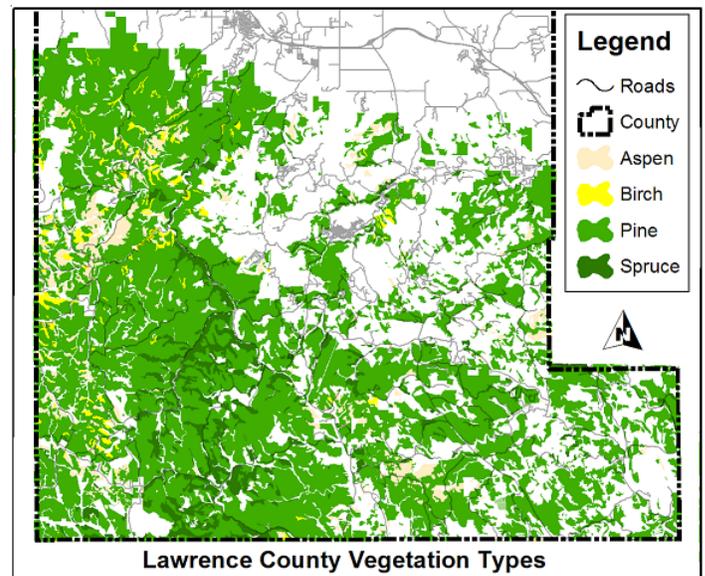
Another important consideration is the insurability of property in the County. If structures are at higher risk from wildfire, insurance companies may not insure these properties, or they may insure them at much higher rates. Insurance companies are recognizing Firewise practices and techniques to reduce the exposure from wildfire. If we can make the overall area better prepared for wildfire, this will help reduce insurance costs or possibly prevent insurance companies from canceling existing policies, or denying insurance altogether.

### Hazards

The vegetation coverage across northern Lawrence County is very diverse. The northern portion of the County is primarily Great Plains Grasses with hardwoods in various draws and drainages. There may also be areas of Ponderosa Pine stands that could pose a threat to structures in Lawrence County. Hardwoods dominate the lower foothills surrounding the Black Hills. Burr Oak, Iron Wood, Quaking Aspen and Paper Birch are some of the primary hardwood vegetation types. These areas of deciduous vegetation types are not as conducive to high intensity wildfires. That is they are not as likely to carry sustained fire through the canopy. Hardwood stands throughout the County

should be identified and measures taken to promote the restoration of these fire resistive species. These areas of deciduous vegetation create a diversity of fuels that significantly reduce fire intensities.

Meadow enhancement programs should also be implemented to reduce the encroachment of conifers and other non-native vegetation into meadows and open spaces. These open spaces provide fuel breaks and areas of opportunity for fire suppression activities. The Black Hills have an abundance of White Spruce also known as “Black Hills Spruce”. Spruce typically grows on the northern slopes and in the bottoms of drainages where more moisture is available. The vegetation on these North slopes is generally much denser due to the higher moisture levels and the relationship to the sun. North slopes usually have less fire frequency than south and west slopes. Occasionally hot, dry weather patterns make conditions right for north slope fuels to burn and possibly with extreme intensities. The branching habit of a Spruce tree is usually continuous from the ground to the top of the tree, which makes them more conducive to torching and crowning. When a Spruce tree torches it showers embers and firebrands that can create



hazards associated with spot fires. Drier winters and lack of spring storms reduces the fuel moisture in large fuel sources that are present in the forest. This may contribute to increased fire behavior. Spruce regeneration in areas that are not historically Spruce stands should be reduced to help protect and promote the original stand species.

Hazardous fuels can also be associated with cured grasses found on the prairie. Tall grasses that are cured and available to burn can generate high intensity fires that can spread very quickly. These grass fires can be very dangerous because of the volatility of the fuels involved. Several firefighter fatalities in South Dakota have occurred on the prairie with grass as the fuel model. Shelterbelts need mitigation from wildfire and are areas of concern if they are not maintained properly. Maintenance may include disking between rows of trees to reduce the amount of fuels from grasses. Removing dead material and restoring with fire resistive plant species may help a shelterbelt survive a wildfire event by reducing fire intensity. Shelterbelts need to be continuously regenerated and maintained to be efficient.

The primary vegetation affecting wildfire in Lawrence County is medium



grass, forbs, Ponderosa Pine and White Spruce. Thinning of live conifers to create canopy separation helps reduce the chance of high intensity stand replacement fires from occurring. A surface fire generally burns with lower intensities and provides larger more mature trees a better chance of survival. These surface fires also help

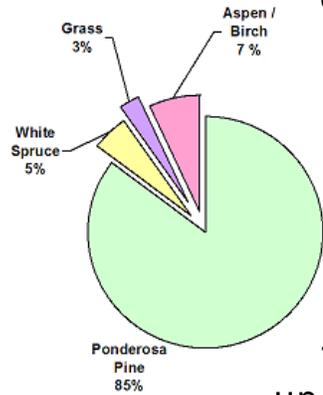


consume typical forest litter and keep fuels from building up to a hazardous level. Fuel reduction activities should target reducing surface fuels such as storm-damaged trees, slash and timber litter. Breaking the vertical continuity of the ladder fuels that contribute to torching and crowning fire behavior help reduce the chance of the fire spreading into the canopy and also improves forest health. Another benefit of reducing crown fires is maintaining the aesthetics after a fire event, thus protecting the economic sustainability across the landscape.

There are many areas in Lawrence County that have had the absence of fire for over 100 years. This has resulted in abnormally high fuel loads measured in tons/acre ratios of fuel. These fuels increase the threat from wildfire by increasing fire intensities and possibly providing a path for the fire to spread into the forest canopy. This is not only detrimental to the forest but it can allow a

fire to become a large enough conflagration to quickly overwhelm fire suppression crews.

Fire history in Lawrence County shows fires can grow to large sizes with extreme fire behavior thus being very detrimental to forest health. Proactive planning and mitigation efforts can lower fire intensities, thereby reducing the loss of life, property, and resources. Existing Hardwood stands should be favored, by reducing the encroachment of conifers. Not only does restoration of these original species maintain the forest in a more natural state but also the deciduous vegetation is much more resistant to sustained crown fire. The USDA Forest Service has developed vegetation data coverage on National Forest system lands.



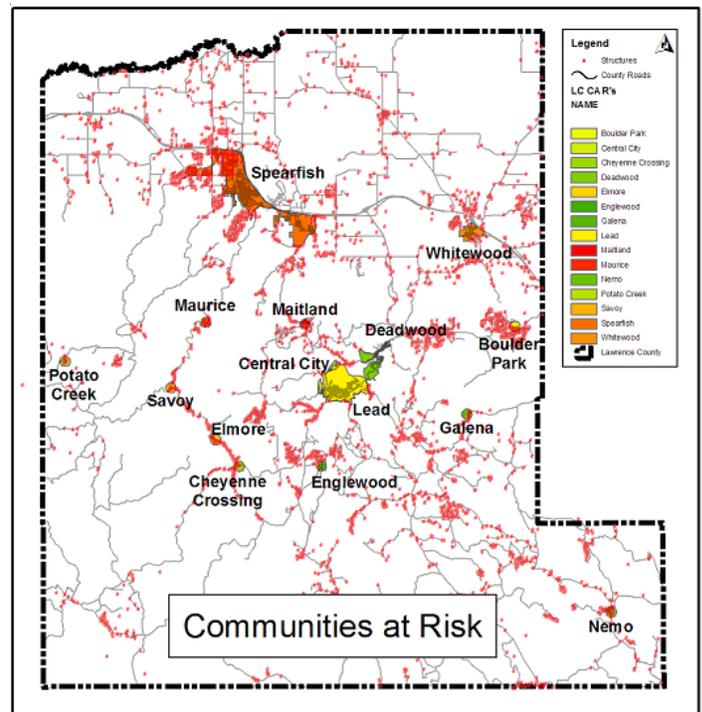
Of 284,163 acres, 2.7% is grassland, 7% is Aspen/Birch, 5% is White Spruce and 85% is Ponderosa Pine. 150,000 acres are unclassified or are irrelevant. Stocking data on private land is unavailable.

### Values

Values at risk in Lawrence County include federal, state, county, municipal and private lands. Agricultural, rangeland, wildlife habitat, recreational, residential, commercial and historical property are all values present in Lawrence County. The USDA Forest Service owns 54% of the land in Lawrence County. This land is valued for wood fiber products, grazing, recreational and the tourism industry. The majority of the other 46% is private

property. The economic value of private land in Lawrence County is very diverse, but very important for sustained economic growth. These properties must be protected from uncontrolled wildfire.

As of October 2006, there were 5,046 inhabited structures and associated out buildings located in the unincorporated portion of the County. These do not include



structures within the municipalities of Spearfish, Lead, Deadwood, Whitewood, and Central City. These homes and the surrounding land, including the aesthetic importance of the vegetation, must be protected to maintain the value of the area. The beauty and appeal of living in the Black Hills could be jeopardized by uncontrolled high intensity wildfires.

This plan will help collaborate ways to share and develop interagency cooperation for hazardous fuel treatments within the County. If the landowners or stakeholders can work together to develop continuity between different fuel projects this will make these treatments more effective. Any and all agencies/landowners

are welcome to share the burden of wildfire prevention in the County.

22% of the rural structures in Lawrence County have been assessed for risk from wildfire. Access, signage, vegetation, topography, water source, fire department response time, survivable space, roofing material, building construction and placement of utilities were all considered during the assessment process.

- Greater than 80% were rated high or extreme hazard from wildfire.
- 46% were at risk from crown fire within 100 feet of the structure.
- 90% have treated between 30% and 70% of their survivable space.
- Less than 6% have treated more than 70% of their survivable space.
- Over 8% have non-fire rated roof coverings.

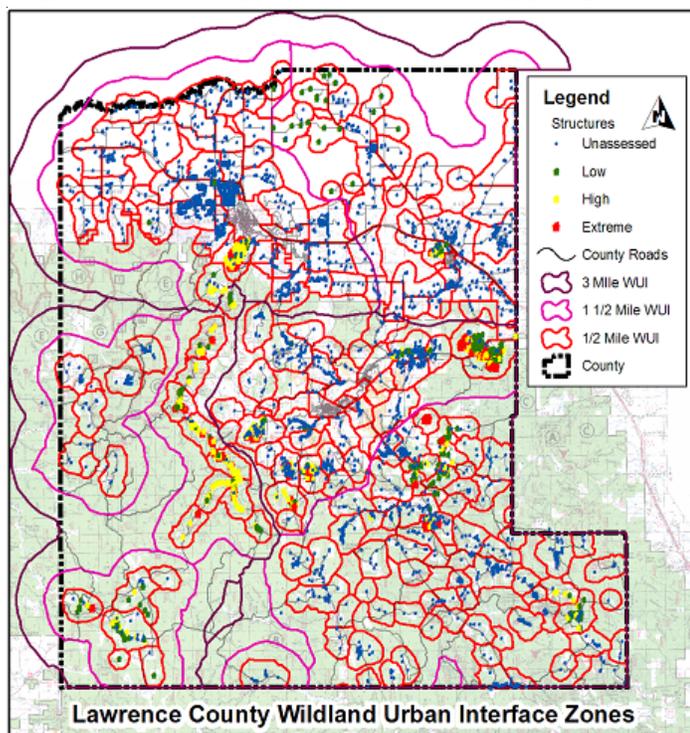
Assessment data was used to display existing conditions within the survivable space of structures in Lawrence County. Fuels, slope and survivable space data indicate that hazardous fuel conditions around structures exist throughout the WUI areas of the county. Prioritization of fuels reduction projects will be coordinated between local, state and federal agencies to reduce the hazardous fuels across the landscape, regardless of ownership.

### **Wildland Urban Interface Zones**

Treatments in identified ½, 1½ and 3 mile buffers will all fall under general prescription parameters until site-specific project areas are identified, at which time prescription elements will be developed according to site specific needs and conditions. An interagency collaborative process will identify and prioritize the site-specific project areas and associated

prescription. The goal of fuels reduction projects will be to reduce the risk from fire by lowering fire intensities and reducing crowning and torching activities that threaten values in the WUI. Treatments should utilize wood fiber as commercial logs, firewood or other forest products where practical. Main considerations for these projects should encourage hardwoods and enhance meadows by reducing encroachment of open space from Pine or Spruce. This will help generate fuel breaks and give fire suppression crews better opportunities for suppression activities. Restoration of original species in stands where Ponderosa Pine and White Spruce have encroached in the last century will help maintain a mosaic of vegetation and species viability of these stands. Existing Spruce stands tend to be uneven aged but usually prevail over Hardwoods. Spruce stands need to be treated as any other Conifer during hazardous fuel activities. Land management should consider the use of free-thinning practices to maintain uneven aged or multi-storied stand structure to obtain stand diversity. These stands may need to be retained in a more open condition if they are to be managed for multi-storied structure classes to achieve ladder fuel reduction objectives. Canopy base height should be considered to reduce torching and crowning during a fire event. This is achieved by interrupting the vertical continuity of the fuels also known as ladder fuels. Crowning index and torching index will help identify areas of high risk. Where available this data will be referenced to help develop fuels treatments. Dead standing trees that contribute to the threat in the WUI should be addressed especially if they pose a

safety hazard to firefighters and the public. Riparian areas and north slopes may retain higher stocking levels where appropriate.



Site-specific spatial data will be analyzed to identify hazards and help develop projects that reduce risk and decrease the potential of structural ignition from wildfire. Structure assessments in the WUI areas should be continued to help assess conditions in the County and determine future mitigation planning strategies. This information in conjunction with GIS will display information more efficiently to help show relationships that may not be apparent otherwise. This data is also important to managers during suppression activities and structure protection during a wildfire. Contact with homeowners during assessment activities allows one-on-one discussion of mitigation efforts landowners can do to reduce the threat from wildfire. People are more aware and interested in wildfire mitigation when it is their own property being discussed. Heightened interest by landowners in wildfire issues will help generate more

support in the area of wildfire mitigation and promote higher levels of participation in the future. Encouraging people to live Firewise lives is crucial to protecting life and property. This cannot be achieved easily but will require the shared responsibility of everyone that has a stake in its success.

The 1/2-mile buffer zones will have a target prescription average of 20-feet of separation between conifer canopies. This can reduce the chance of active crown fire in the general vicinity of structures and other improvements. Structure data of Lawrence County contributed to the development of 176 1/2 mile WUI zones that consist of approximately 229,000 acres. These 1/2 mile buffers have been identified around inhabited structures and defined communities at risk. The intent of these buffer zones is to reduce hazardous fuels to the point where the average worst condition during a wildfire would not support a high intensity crown fire in the vicinity of values in the WUI. This should be done by providing conifer canopy separation, removal of ladder fuels and removing or treating all surface fuels. Conifer stands need aggressive treatment to reduce the chance of high intensity fire or lofted embers from endangering communities ahead of severe wildfire. When a wildfire approaches a structure through these 1/2 mile buffers, it should decrease in intensity and burn on the ground. This would give suppression crews a safer environment and better opportunities for protecting life, property and resources.

The 1 1/2-mile buffer zones will have a target prescription of an average of 10 feet between conifer canopies. Stands may be stocked at higher levels if they do not threaten WUI values during a fire event from radiant, convective heat or lofted

firebrands. 35 1½-mile buffer zones have been identified that account for approximately 243,000 acres.

The 3-mile WUI buffer zones will be treated to reduce uncontrolled high intensity wildfire such as the 1959 Deadwood Fire or the Grizzly Gulch Fire of 2002. The identified 3-mile buffer zones consist of approximately 146,000 acres and enable land managers to design projects at a landscape level. Large areas of slash may require the creation of fuel breaks where slash will be piled and burned or chipped. The homogeneity of the forest will be diversified at a landscape level to provide strategic protections emphasizing safety and survivability for homeowners and landowners to escape a fire event. Additionally, these treatments will reduce the hazardous fuels and increase the survivability of the forest environment surrounding private property. Firefighters will then have opportunities to engage in firefighting activities in an environment where their life safety is not compromised and the probability of success is greatly increased.

Slopes with south or west aspect, “hot slopes”, that are situated with a southerly orientation from communities or that are below communities on a slope may need more aggressive treatments. South and west slopes may require more aggressive thinning to provide greater open spaces, which would significantly lower fuel loads that would influence fire behavior in these critical topographic areas from fast moving fires spreading from dry southerly winds. Under story and ladder fuels should be managed to reduce the risk of crowning and torching.

Prescribed fire should be used to manage surface fuel levels and maintain

historical fire scars where appropriate. Burned areas may need future fuel treatments because of fuels that were not completely consumed during the initial fire



event. Generally, forest thinning or logging slash should be removed, chipped, ground, or piled and burned in such a manner that would minimize the potential for residual forest stands to be damaged if the resulting residue was consumed during a fire event. Slash created by forest operations should be managed according to federal, state and local requirements. At the minimum, all slash will be lopped and scattered and will not exceed a depth of more than 18 inches. Forested areas should be managed in such a manner that will minimize the chances of a catastrophic crown fire from threatening WUI values, forest health and aesthetics. Not all forest stands will be required to be thinned. There are many areas in the Black Hills that are not conducive to landscape treatments due to topography and terrain characteristics.

The intent of these treatment guidelines is to reduce the risk to values in the Wildland Urban Interface. Interagency collaboration by all interested stakeholders will help reduce the conflict with other land management programs and forest management objectives. Areas of endangered species, critical wildlife habitat or areas with mandated special requirements would require special considerations. Various treatments across the landscape should be developed to

dovetail together to reduce risk from uncontrolled wildfire. Prescribed burning, mechanical thinning and slash treatment activities are very important for reducing hazardous fuel conditions. Fire and fuel management through above described methods will help protect biological and aesthetic values, but reducing the risk to the values in the Wildland Urban Interface will take precedence not only to protect structures but also aesthetics and valuation of property and resources.

Access is an important consideration for emergency response whether it is fire, ambulance or law enforcement vehicles. All of these agencies may be responding into an incident area. Another consideration would be the public evacuating during a wildfire incident and emergency service personnel responding into the area; properly planned access would provide a safer and more efficient environment. Primary access roads should be built to County specifications. Design loads for bridges on driveways longer than 200-feet should be rated to support the maximum weight of the responding apparatus.

### **Ingress & Egress**

Primary ingress/egress roads in Lawrence County have been identified and should be treated to provide for safe access during a fire event. These roads have been buffered at 180-feet on either side; with the last 30-feet tapering into a natural forest habitat creating a shaded fuel break. These shaded fuel breaks provide a more pleasing aesthetic appearance because the treatments do not end abruptly at the edge of the treatment area. The forested areas of these buffered escapeways need to be managed in such a manner that will minimize the chances of a

catastrophic crown fire from threatening the use of these travel routes during a fire event. If the 180 foot buffer cannot be achieved the entire road right-of-way shall be treated. Ladder fuels and timber litter would be greatly reduced or eliminated within these fuel breaks. Conifer canopy separation of approximately 20 feet between individual crowns is desirable with small clusters of trees allowable to create diversity. These fuel breaks will also provide fire crews opportunities to conduct tactical suppression activities and possibly reduce spread of an active crown fire.

### **Watersheds**

Watersheds in Lawrence County must to be managed in such a way as to minimize the chance of catastrophic fire that would threaten forested areas. When managing watersheds, consideration to protecting and enhancing soil productivity, water quality and quantity and timing of water flows. Maintaining healthy watersheds is critical to supporting a healthy forest and also provides water sources to communities by transferring water into aquifers. Watershed management will enhance watersheds by implementing practices to retain soil stability and improve or maintain water production. Securing favorable conditions of water flow and preserving or enhancing aquatic values should be a major concern. Wildfires significantly alter the collection and transportation of water through a watershed. Increased flow rates after a catastrophic fire event may include severe ash and mud slides that may be very detrimental to areas down-stream.

In Lawrence County the major bedrock aquifers are the Madison and the Minnelusa formations. The outcrops of the Madison and Minnelusa formations occur

in many areas of Lawrence County. On the western side the outcrops occur on the Limestone Plateau; on the eastern and northern sides they generally occur near the foothills. Losses that contribute to aquifer recharge occur in numerous streams that cross outcrops of various rock formations that are exposed in Lawrence County. The Madison and Minnelusa aquifers receive recharge from stream flow losses and precipitation on the outcrop. These primary aquifers provide the resource for communities to draw precious water for daily activities. Stream flow recharge to the Minnelusa aquifer generally is less than to the Madison aquifer because much stream-flow is lost to the Madison aquifer before reaching downhill to the outcrop of the Minnelusa Formation. These stream flow losses are recognized as an important source of local recharge to regional bedrock aquifers. Some streams lose all of their flow up to some threshold rate. Stream flow is maintained through a loss zone when the threshold is exceeded. Watersheds upstream of recharge areas need to be protected from catastrophic wildfire.

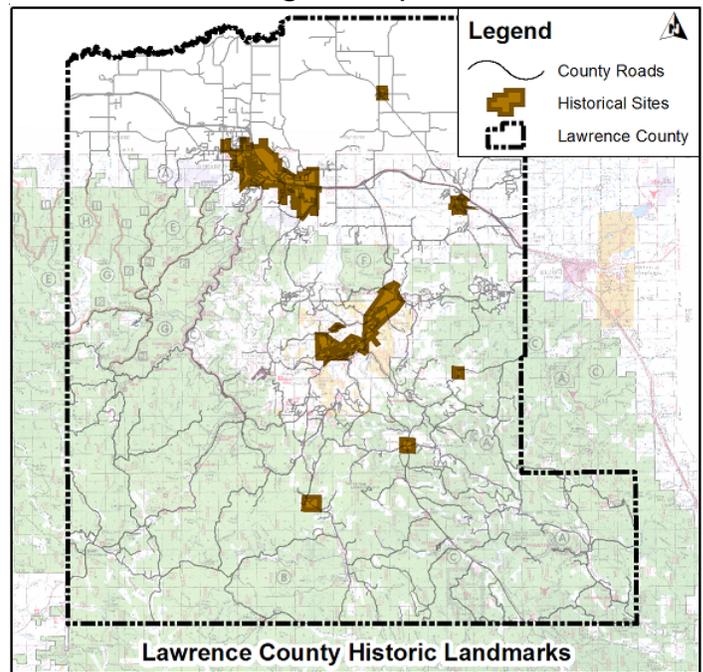
### Historical Sites

Properties listed in the National Register of Historic Places include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Park Service administers the National Register, which is branch of the United States Department of the Interior.

There are 50 registered historical sites in Lawrence County. Of these, 35 sites are located in Spearfish. Deadwood, Lead and Central City contain 5 sites and St. Onge has 5 sites. Galena, Nemo and Brownsville all are registered with 1

historical site each and Whitewood also has 1 site. One historical site may consist of many structures, for example the town of Deadwood has many significant historical buildings and sites but the town as a whole is just counted in the Register as 1 site.

These sites present a range of beautiful historic places throughout the County. Visitors can access places well worth visiting in the Black Hills. Both individual historic destinations and districts can be easily found that cover a tremendous range for points of interest.



The historical places in Lawrence County are not only important for historical value but local residents and tourists value them. Mitigation efforts to help preserve these sights are important and should be considered during fuel treatments in these areas.

### Goals And Objectives

The intent of this plan is to reduce the threat of catastrophic fire that would threaten life, property or natural resources. Hazardous fuels reduction projects will be identified through a collaborative effort between local government, local fire

authorities and state and federal agencies. Prioritization of fuels reduction projects will be developed through a corporative process to reduce the risk of catastrophic fire events threatening WUI areas. Structure density, fuel loads, canopy condition and other existing conditions will help determine treatment priority. Building continuity between different agency projects will make them more effective in the mitigation of severe wildfire events.

The hazardous fuels reduction programs identified in this plan will facilitate the thinning of hazardous fuels thereby creating canopy separation to reduce the chance of sustained catastrophic crown fire in the survivable space of structures in the WUI. Ladder fuels and the dead and down timber litter will also be treated to reduce fire intensities.

Public education programs will be developed to inform people, who live in the WUI, what they can do to reduce their risk from wildfire. Pamphlets, flyers, letters, articles and spots in various media outlets, community meetings, Firewise workshops and forums will be developed and implemented. Educating stakeholders about Firewise practices and procedures will help them understand ways to mitigate the threat from wildfire.

Development or improvement of survivable space by removing hazardous fuels within the home ignition zone will increase a structures chance of survivability. This will also provide fire suppression crews a safer work area so they can be more effective.

Assessment data of structures in WUI areas of Lawrence County will determine areas that are at high risk from wildfire and provide information that is critical in continued mitigation efforts.

Current data of the County will be provided as needed, prior to the fire seasons for use in the field by fire departments and fire management operations. These pre-attack plans will be GIS based so the plans can be updated as current GIS data is developed.

The Community Wildfire Protection Plan is a working document that will provide the best protection possible for the residents of Lawrence County. Efforts to pursue implementation of a WUI fire code, should be considered. A code or ordinance would be beneficial to promote safer, more responsible planning and development in WUI areas. By giving more consideration to developing better roads, more survivable space, more open areas, better water sources and using more fire resistive building materials and firewise building practices, there may be a significant reduction in loss of values from wildfire.

Collaboration will be developed between federal, state, county and local agencies. Hazardous fuels reduction treatments can be more effective by coordinating and sharing information about plans and projects. The intent of this interagency effort will be to help various fire mitigation programs become more effective by generating continuity between treatment areas.

Reducing fire intensity and incident severity will increase the fire suppression effectiveness at an incident. Providing a safer environment for firefighters and the general public will help provide higher degree of protection for values at risk.

### **Tactical Plan**

Property owners will be informed about the Individual Hazardous Fuels Cost Share Program and the results of the

assessment of property in the WUI area will be used to determine what needs to be done to mitigate for hazards. Fuel loads, topography and survivable space are the primary considerations for priority of participants. Properties with high or extreme grant eligibility ratings would have a higher priority to receive funds from the program than property that has a low rating. Once it has been determined that the property is eligible for the program the landowner would fill out a request for cost sharing assistance form. It is important to remember this program only **reduces the risk from wildfire**. It does not eliminate the risk from wildfire.

Fire history is important and efforts to develop and maintain accurate information are essential. Cooperation between agencies to improve documentation of fire history should be a continuing effort. The circumstances during a fire event such as conditions of fuels, temperature, relative humidity, fire behavior and topography are important when planning mitigation strategies.

Assistance will be provided to fire departments, homeowners associations and other communities in the WUI areas to identify hazards and help develop projects to reduce risk will be developed. Helping these entities identify and take steps to become more fire safe can reduce potential loss of life, property and resources.

Structure assessments of private property in the WUI areas will continue to be done to help assess conditions in the County and determine future mitigation planning strategies. Form 502 will be used in conjunction with GPS and GIS to map and display this information more efficiently to show relationships that may not be

apparent otherwise. Contact with homeowners during this process allows a one-on-one discussion of ideas landowners can do to reduce the threat from wildfire. People are more aware and interested in wildfire mitigation when it is their own property being discussed. Heightened interest by landowners in wildfire issues will help generate more support in the area of wildfire mitigation and promote participation in the future.

### **Hazardous Fuels Reduction Programs**

The Individual Hazardous Fuels Cost Share Program will provide a mechanism to achieve a structural condition of fuels that may reduce the risk to the values in Lawrence County. All ladder fuels must be trimmed up a minimum of 6-feet off the ground. This breaks the vertical continuity of the fuel and prevents the fire from spreading into the canopy. Isolated patches of volatile shrubs and regeneration can exist if they are well separated from surrounding canopy. Under story and dead forest litter must be removed.

Conifer canopy shall have an average of 20 feet of separation between neighboring conifer canopies. Steep slopes require more spacing between trees to maintain canopy separation and to protect against more aggressive fire behavior. When selecting trees for removal, large dominant trees that are straight, with good form and vigor should be left providing they meet the minimum spacing requirements. Remove all storm bent or damaged trees. Also dead, split top or trees with stem cankers should be removed. Remove unhealthy or defective trees first and then remove remaining trees until desired spacing is achieved.

Mitigating the threat from wildfire by reducing hazardous fuels will be accomplished through a cost-sharing program between private land owners who are interested in participating and Lawrence County. The liaison for this program will be the Wildland Urban Interface Specialist. The main focus of this fuels reduction program will be in the 30-200 foot survivable space around structures and associated outbuildings. This area may be enlarged if it would be beneficial to other structures or values in the area. The WUI Specialist administering the program will determine the area to be treated. Landowners will also be encouraged to consider mitigating other hazardous fuels on their property to allow the ecological sustainability of the forest. This will not only promote a healthier forest, but it will maintain the value and aesthetics of the area in the event of a fire.

To diminish the threat from wildfire action needs to be taken to reduce fire intensity in proximity to structures, associated outbuildings and other values at risk. This will provide fire suppression crews a better opportunity to perform suppression activities and a safer working environment.

Landowners participating in the Individual Hazardous Fuels Cost Share Program will be required to submit 2 bids from contractors for the project area. Cost share assistance will be based on the lowest bid. The landowner will be responsible for all work being performed on the property and for the project being done to the specifications of the prescription. The landowner will track all costs and provide documentation of such at the completion of the project. Any profit or revenue received by the landowner as a result of the fuels reduction project will be subtracted from the total cost of a project

before determining the total of all qualifying costs. Documentation of any and all revenue the landowner receives as a result of the fuels reduction must also be provided at the completion of the project. The program will reimburse the landowner 50% of a maximum of \$1000 per acre. The commitment to maintain this prescription for 10 years by the landowner will increase the cost share of the program to 60% of \$1000 per acre. There would be no reimbursement for this maintenance after the initial completion of the project. Qualification of a property for the program will be based on assessment data using Form 502, (see page 32), the discretion of the WUI Specialist.

This program will provide a maximum of \$600 per acre of matching funds for hazardous fuels reduction. Projects that will be eligible for the cost share program include; thinning dense stands of trees, thinning dense under story, using prescribed fire to reduce hazardous fuels, slash or biomass disposal, eliminating ladder fuels and removal of volatile fuels in close proximity to structures. This program is not intended to provide selective tree removal if the entire survivable space of the structure and associated outbuildings are not considered and treated.

When the project is complete a certificate of completion form must be submitted to Lawrence County along with a W-9 form, a claim against Lawrence County form and a copy of the invoice with the cancelled check. The project will be inspected to insure all requirements have been met and then the landowner would be reimbursed for the amount of the approved project.

Firewise landowners that have participated in the hazardous fuels reduction program may receive a

certificate of completion and upon request could be provided with a sign indicating that they occupy a Lawrence County Firewise home.

Lawrence County will not be held liable for work that is conducted under this program on a landowner's property. The property owner will be responsible for all work being completed to the standards of the prescription. All issues that arise with the contractor will be the responsibility of the landowner.

Funding for additional hazardous fuels reduction programs will be pursued to continue reducing risk from wildfire in Lawrence County. These projects may include larger landscape scale treatments. Projects may vary depending on the situation, cost-share requirements and available funding.

Forest products generated from the treatments may be used as in-kind match or cost-share. Existing values in the WUI will be assessed using Form 502 and ratings of high or extreme will be considered for mitigation projects. A narrative for newly identified projects will be developed to justify the need. This narrative will be used to support the application of funding opportunities.

There is no guarantee that the property treated will survive a wildfire event. This program is only intended to **reduce the risk** from wildfire.

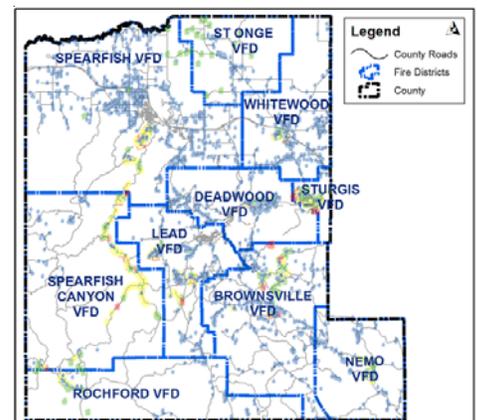
### **Fire Departments And Apparatus**

The level of Emergency preparedness in Lawrence County relies on volunteer fire fighters. Response capability may vary dramatically depending on the day and time of the incident. Most departments can respond and be effective until the incident severity exceeds the

capability of the responding agency. As the severity of an incident increases the capability and effectiveness of suppression crews may be dramatically reduced. All of the departments in Lawrence County have increased their wildland response capability in recent years. Considering the downward trend of volunteer fire department memberships, most departments would be unable to man all of their apparatus 24 hours a day, 7 days a week. Most volunteers cannot stay out on a fire for extended amounts of time because they have employment and other obligations.

Many of the fire departments are operating on a limited annual income. The cost of refurbishing or replacing fire apparatus makes it prohibitive for many of the departments to upgrade older apparatus. Many of the older apparatus are still in use but the serviceability of this older equipment may be a concern.

There are 10 volunteer fire department protection districts in Lawrence County. The following is a comprehensive listing of all the fire apparatus located in Lawrence County; Brownsville, Deadwood, Lead, Nemo, Rochford, South Dakota Wildland Fire Suppression Division (Nevada Gulch), Spearfish, Spearfish Canyon, St. Onge, Sturgis and Whitewood. Because the fire departments are manned by volunteers the status and response capability may vary.



The United States Department of Agriculture has 6 type 6 engines and one type 4 engine in the North Zone of the Black Hills. They also have two 10-man crews. A rotating schedule of staff will make a minimum of 4 engines available on any given day and a maximum of 7 engines available during elevated fire danger or fire activity for State and Federal jurisdiction response areas.



**Brownsville Fire Department**

11790 Brownsville Road

Deadwood, SD 57732

\*Type 2 Engine 1962 Ford

\*Type 6 Engine 2003 Ford F550

\*Type 6 Engine 2007 Ford F550

\*Type 3 Tender 1979 Ford F600

(Data from 2007)



**Deadwood Fire Department**

737 Main Street

Deadwood, SD 57732

\*Type 1 Engine 2003 6x6 International

\*Type 1 Engine 1971 Ford

\*Type 1 Engine 1989 Ford 4x2

\*Type 6 Engine 2003 Ford

\*Type 6 Engine 2003 Ford F350

\*Type 2 Tender 2006 International

\*1982 American LaFrance 100 ft. Ladder Truck

\*Type 9 CAFS 2001 ATV

**County Equipment housed at the Deadwood Fire Department**

\*Type 2 Tender 2001 Oshkosh

(Data from 2007)



**Lead Fire Department**

801 West Main Street

Lead, SD 57754

\*Type I Engine 1986 Volvo

\*Type 6 Engine CAFS 2002 Ford

\*Type 6 Engine 2002 Ford

\*Type 6 Engine 1988 GMC

\*Type 6 Engine 1989 Ford

\*Type 7 Engine 1961 International 4x4

\*Cascade Truck 1981 Jeep

\*Rescue Vehicle 1978 Dodge

(Data from 2007)



### **Nemo Fire Department**

12752 Nemo Road

Nemo, SD 57759

- \*Type 2 Engine 1986 GMC
  - \*Type 3 Tender 2006 Freightliner
  - \*Type 6 Engine 2006 Ford F550
  - \*Type 6 Engine 2003 Ford F550
- (Data from 2007)



### **Rochford Fire Department**

11701 Rochford Road

Rochford, SD 57745

- \*Type 2 Engine 1973 Lavern
  - \*Type ? Engine 1968 Kaiser
  - \*Type ? Engine 1986 Chevy
  - \*Type ? Engine 1986 Chevy
  - \*Type 3 Tender 1976 Chevy
- (Data from 2004)



### **S.D. Wildland Fire Suppression Division, Nevada Gulch**

11361 Nevada Gulch Road

Lead, SD 57754

- \*Type 4 Engine CAFS
  - \*Type 6 Brush Engine
  - \*Type 6 Brush Engine
- (Rapid City District)**
- 4 personnel all winter + 10 Black hats
  - 10 summer personnel + 20 Black hats
  - \*4 Type 6 Engines
  - \*Type 3 Engine CAFS
- (Data from 2007)



## **Spearfish Fire Department Main Station and East Substation**

622 Canyon Street  
Spearfish, SD 57783

- \*Type 1 Engine 1991 Emergency-One
  - \*Type 1 Engine 1994 Freightliner
  - \*Type 1 Engine 2003 Spartan
  - \*Type 3 Engine 2004 Emergency-One
  - \*Type 6 Engine 2000 Ford
  - \*Type 2 Tender 1991 Peter built
  - \*Type 6 Engine 2003 Ford
  - \*Type 6 Engine 2004 Chevy
- (Data from 2004)



## **Spearfish Canyon Fire Department**

21116 US Highway 14A  
Lead, SD 57754

- \*Type 2 Engine 1983 Ford
  - \*Type 2 Engine 1984 Chevy
  - \*Type 3 Tender 1989 International
  - \*Type 6 Engine 2003 Ford
  - \*Type 6 Engine 2003 Ford
- (Data from 2007)



## **St. Onge Fire Department**

234 1st Street  
St. Onge, SD 57779

- \*Type 3 Tender 1987 Chevy C65
  - \*Type 6 Engine 2003 Ford
  - \*Type 6 Engine 1989 Chevy
  - \*Type 9 Engine 1949 Jeep
- (Data from 2007)



## **Sturgis Fire Department**

1901 Ball Park Road

Sturgis, SD 57785

- \*One-ton Utility #1 1991 Chevy
  - \*Rescue-Medium #1 1995 International
  - \*Rescue 1991 Ford F350
  - \*Command/IC 2004 Chevy Suburban
  - \*Command/Transportation 1989 Chevy
  - \*Type 2 Engine #1 1969 Ford
  - \*Type 2 Tender #5 2004 International
  - \*Type 2 Tender #6 2003 International
  - \*Type 6 Brush #1 2003 CAFS Dodge
  - \*Type 6 Brush #2 1998 CAFS Dodge
  - \*Type 6 Brush #3 1978 Dodge
  - \*Type 6 Brush #4 2000 Dodge
  - \*Type 6 Brush #5 2002 Dodge
  - \*Type 1 Engine #2 2006 Spartan
  - \*Type 1 Engine #4 2000 International
- (Data from 2007)



## **Whitewood Fire Department**

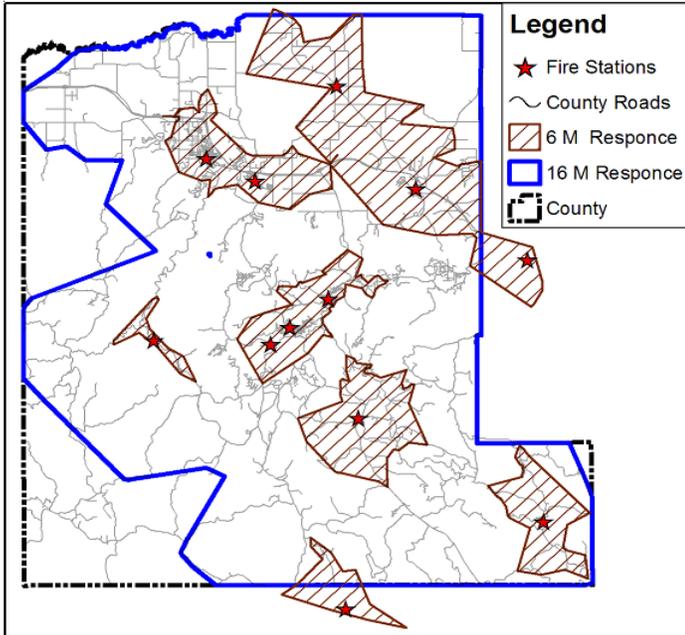
912 Garfield Street

Whitewood, SD 57793

- \*Type 1 Engine 1976 LaFrance 3-T
  - \*Type 1 Engine 2006 Crimson
  - \*Type 6 Engine 2003 Ford
  - \*Type 2 Tender 1982 Volvo
  - \*Type 6 Engine 2003 Ford
  - \*Command/IC 1996 Chevy Suburban
  - \*Utility 1979 Chevy
  - \*Utility 1978 Chevy
- (Data from 2007)

## Fire Department Response Times

Response times for the 10 volunteer fire departments that provide fire protection in Lawrence County have been analyzed to determine areas of coverage for 6 and 16-minute response times. These



response times depict the coverage available by driving from a fire station in any direction for the times identified. These areas do not reflect the response time required for personnel to respond to the station and go into service.

Volunteer fire departments, especially in rural settings, will not be in service in the 1 minute and at the scene in an additional 5 minutes as suggested in the NFPA 1710 code. They may, however, be able to respond in the 16-minute time frame period. The 16-minute response time shows significant coverage of the County. There are a few areas in the west and south western corner of Lawrence County that have a deficiency in response times from existing fire stations. This analysis shows the need for future development of first response in these areas of the County.

## Action Items

- Firewise forums may be held annually.
- Public mailings will be provided to inform landowners about the hazardous fuels reduction cost share program.
- Advertisements will be placed in local publishing.
- Firewise public service announcements will be broadcast on local radio stations.
- Fire departments should participate in public activities to promote Firewise.
- Additional funding opportunities should be explored to provide fuels reduction to protect values in Lawrence County.

## Public Information

The public shall be provided with important information pertaining to maintaining a safe Firewise property. Building construction and fuel modification are the key factors in preventing initial ignition. Fire resistive building materials need to be used to keep a wildfire from igniting a structure from direct flame impingement or from radiant or convective heat transfer. Fire resistive vegetation should be used in the home ignition zone of a structure to help reduce fire intensity. Interrupting fuel can reduce the spread of fire to values in Lawrence County.

Firewood, combustible materials and other fuel sources should not be stored in unenclosed spaces beneath structures, on decks, under eaves, canopies or overhangs. These materials should be a minimum of 30-feet from the structure. These items should, however be within the survivable space of the structure so they can be protected but situated so they do not present a hazard during a fire event. See page 32 & 33 for fire resistive building construction requirements.

All structures should be marked with the appropriate address signage. If the structure is not visible from the primary road the structures address should be posted at the primary road. Signage should be clearly visible and constructed with fire resistant material.

Residents should be encouraged to develop a fire protection plan that addresses specific details to be more prepared from wildfire. These may include: topography, slope/aspect, flammable vegetation, climatic conditions, fire history, water sources, access, building ignition, fire resistant factors, equipment, survivable space and vegetation management.

Survivable space is very important when mitigating for wildfire. Building materials, types of vegetation and fuel loads are key considerations when determining how much survivable space is required. Effective survivable space may be anywhere from 30-200 feet. Structures that are built on steeper slopes require more survivable space on the down slope side. There is documented scientific research that indicates structures that are 100- feet or farther from high intensity crown fire normally do not ignite from radiant or convective heat. Usually, it is the small things that people overlook that cause initial

ignition of the structure. Privately owned parcels shall be maintained so that they will not support high intensity crown fire. Ladder fuels need to be removed to lower the possibility of the fire spreading up into the canopy from the ground. Not only is there a danger of a fire approaching from outside an area but there is also the danger of a fire starting within the survivable space and spreading outward. Surface fuels need to be significantly reduced or eliminated to reduce surface fire intensity. See page 31 for fuel treatment requirements. Fire resistive vegetation is an efficient way to reduce fire intensities. Hardwoods and deciduous types of vegetation are good ways to provide safety, while providing pleasing aesthetic value. See page 34, Fire Resistive Plant Species for the Great Plains, for a complete list of fire resistive vegetation.

Structures situated in the open areas also need to give consideration to the hazards associated with fuels such as cured grasses. Mitigation efforts could include graveled driveways and/or disking fuel brakes. This will interrupt the continuity of the natural fuels that threaten a structure.

A fire resistive roof covering is needed to protect a structure from initial ignition from firebrands. Windows and skylights should be double pained or tempered glass. No vinyl or plastic windows, door assemblies or siding. All structure openings need 1/8-inch metal screen to keep out embers and wind-blown fuels. Eaves should be enclosed and not vented. All external walls and decks should have a minimum of a 20-minute fire rating. Debris needs to be kept off roofs and out of gutters. These areas should be rechecked throughout fire

season. Heavy timber or log construction is acceptable; these materials have a lot of mass and possess high heat absorbency characteristics.

The Lawrence County Hazardous Fuels Reduction Program will be available to help landowners achieve desired fuel loads. This cost share program will be offered for as long as the funding is available. FireWise property will help to protect values against uncontrolled wildfire.

Encouraging people to live Firewise lives is crucial to protecting life and property. This cannot be achieved easily but will require the shared responsibility of everyone that has a stake in its success.

## Fuel Treatment Requirements

1. For the entire project area (e.g. ½ mile WUI zones):
  - A. Conifer canopy spacing shall be separated by an average of 20 feet depending on forest conditions. Additional fire precaution measures may be required because of fire hazard in the following area:
    1. Where slopes in or adjacent to proposed developments are in excess of 20 percent; or
    2. Where a specific fire danger is identified.
  - B. All surface fuels must be removed or treated.
  - C. Ladder fuels under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading vertically into the conifer canopy.
2. In the survivable space of the home site:
  - A. All conifer canopy spacing shall be maintained at an average of 20 feet.
  - B. All surface fuels must be removed or treated.
  - C. Ladder fuels under trees within the fuel modification area shall be maintained at a height that will preclude ground fire from spreading vertically into the conifer canopy.
3. In the area extending to the road right-of-way from a road:
  - A. All conifer canopy spacing shall be maintained at an average of 20 feet.
  - D. All surface fuels must be removed or treated.
  - B. Ladder fuels shall be trimmed up a minimum of 6 feet above the ground to the interrupt vertical fuel continuity.

## Fire Resistive Building Requirements

Requirements addressing building design, location and construction are set forth as below:

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

- P. Exterior doors shall be solid core wood no less than 1¾-inch thick, approved noncombustible construction, or have a fire protection rating of no less than 20 minutes.
- Q. Vents for attic and sub-floor ventilation shall be screened with a corrosion-resistant wire mesh, with the mesh opening not exceeding nominal 1/8 inch in size.
- R. No vents shall be installed in a location that faces heavy vegetative fuels.
- S. Every fireplace and wood stove chimney and flue shall be provided with an approved spark arrester constructed of a minimum 12-gauge welded wire or woven wire mesh, with openings not exceeding ½ inch.
- T. Vegetation shall not be allowed within 10 ft of a chimney outlet.
- U. Accessory structures shall meet all of the requirements of this section or shall be separated from the main structure by a minimum of 30 feet.
- V. Permanently located mobile and manufactured homes with an open space beneath shall have a skirt of noncombustible material or material that has a minimum fire-resistive rating of 20 minutes.
- W. Any enclosed space beneath the mobile or manufactured home shall be vented according to C. above.

# Fire Resistive Plant Species for the Great Plains

All Plant material will burn but the following is a list of plants that are more fire resistive.

<b>Trees:</b>	<b>Common Name:</b>	<b>Perennials:</b>	<b>Common Name:</b>
Betula	Birch	Achillea spp.	Yarrow
Acer spp.	Maple amur and silver	Allium schoenoprasum	Chives
Alnus spp.	Alder	Bergenia spp.	Bergenia
Catalpa speciosa	Northern Catalpa	Brodiaea spp.	Lily
Cornus florida	Flowing Dogwood	Coreopsis spp.	Coreopsis
Fraxinus spp.	Ash green	Erysimum linifolium	Wall flower
Gleditsia tricanthos	Honeylocust	Eschscholzia spp.	California poppy
Malus spp.	Apple siberian crab	Fragaria sp.	Wild Strawberries
Populus spp.	Aspen, Cottonwood, Poplar	Geranium spp.	Geranium
Prunus spp.	Cherry common chokecherry	Hemerocallis hybrids	Daylillies
Quercus spp.	Oak (bur)	Heuchera spp.	Coral bells
Robinia pseudoacacia	Black locust	Iris spp.	Iris
Salix spp.	Willow golden and white	Kniphofia uvaria	Red hot poker
Ulmus pumila	Siberian elm	Lupinus spp.	Lupine
Pyrus ussuriensis	Harbin pear	Oenothera spp.	Evening primrose
		Penstemon spp.	Beard tongue
		Solidago spp.	Goldenrod
		Strachys bysantina	Lamb's ear
<b>Shrubs:</b>	<b>Common Name:</b>	<b>Groundcovers:</b>	<b>Common Name:</b>
Amelanchier spp.	Serviceberry	<b>Succulents:</b>	
Atriplex canescens	Four Wing Saltbush	Delospema nubigenum	Hardest ice plant
Buddilia davidi	Butterfly Bush	Echeveria spp.	Hens & Chicks
Caryopteris x clandonensis	Blue-Mist Spiria	Sudem spp.	Stone crops
Cornus serica	Red Osier Dogwood		
Cotoneaster spp.	Cotoneaster	<b>Non-succulents:</b>	
Ligustrum spp.	Privet	Schillea tomentosa	Wolly yarrow
Mahonia spp.	Creeping Grape Holly	Ajuga reptans	Carpet bugle
Pachistima canbyi Dqarf	Mountain Lover	Arctostaphylois uva-ursi	Kinnikinnick
Philadelphus spp.	Mock Orange; Syringa	Armeria meritima	Sea pink; thrift
Rhamnus fragula	Buckthorn	Cerastium tomentosa	Snow in summer
Rhododendron spp.	Azalaes, Rhododendrons	Cotoneaster dammeri	Bearberry cotoneaster
Ribes spp.	Currant	Euonymus fortunei	Winter creeper
Sheperdia argentea	Silver buffaloberry	Potentilla tabernaemontanii	Spring cinquefoil
Symphoricarpos albus	Snowberry	Senecio cineraria	Dusty miller
Viburnum trilobum	Cranberry bush	Thymus praecox articus	Mother of thyme
Yucca spp.	Yucca	Verbenia bipinnatifida	Verbenia
Syringa vulgaris	Common lilac		

The highlighted species have a higher chance of survival; the other species may grow as a landscape species with proper care and recommendation.

# Firewise Landscaping



*Photo courtesy of U.S. Fish and Wildlife Service. Battle Creek fire of 2002.*

The following guidelines can help to reduce the risk from wildfire.

- Make sure your house number is visible.
- Keep grass and lawns cut short and well irrigated
- Use fire resistive vegetation in close proximity to structures
- Separate natural fuels from combustible structure materials
- Provide survivable space for structures
- Keep dead organic material maintained
- Keep trees a minimum of 15 feet away from chimneys
- Combustible materials attached to the house may be a concern
- Topography will influence the amount of survivable space required
- Provide a hose and ladder for fire service personnel
- Keep firewood and other fuels at least 30 feet from structures

# Fire Hazard Severity Form

## Form 502

### A. Subdivision Design Points

- |  |  |         |
|--|--|---------|
| 1. Ingress/Egress  |  | 1 ____  |
| Two or more primary roads  |  | 3 ____  |
| One road   |  | 5 ____  |
| One-way road in, one-way road out  |  |         |
| 2. Width of Primary Road   |  |         |
| 24 feet or more  |  | 1 ____  |
| Less than 24 feet  |  | 3 ____  |
| 3. Accessibility Road grade  |  |         |
| 5% or less   |  | 1 ____  |
| 5% to 10%  |  | 5 ____  |
| 10% or more  |  | 10 ____ |
| 4. Secondary Road Terminus,  |  |         |
| Loop roads, cul-de-sacs with an outside turning radius of 45' or greater |  | 1 ____  |
| Cul-de-sac turnaround or dead end roads 200 feet or less in length       |  | 3 ____  |
| Dead-end roads greater than 200 feet in length                           |  | 5 ____  |
| 5. Street Signs  |  |         |
| Present  |  | 1 ____  |
| Not present  |  | 5 ____  |

### B. Vegetation

- |  |  |         |
|--|--|---------|
| 1. Grass   |  | 1 ____  |
| Light – Only grass/forbs less than 2 feet tall   |  | 3 ____  |
| Medium – Grass greater than 2 feet tall  |  | 5 ____  |
| Heavy – Grass with conifer reproduction covering 25% or more ground area                                 |  |         |
| 2. Conifer: Ponderosa pine or pine spruce mix  |  |         |
| Light – Open well space conifers greater than 10 feet tall with grass/forbs                              |  | 3 ____  |
| Medium light–Conifers more than 50% of vegetation, crowns not touching w/ no ladder fuels                |  | 5 ____  |
| Medium – Conifers more than 50% of the vegetation, crowns not touching, with under story or ladder fuels |  | 7 ____  |
| Heavy – Dense conifers with crowns touching  |  | 10 ____ |
| Extreme – Dense conifers w/ crowns touching & thick dead and down fuels and ladder fuels                 |  | 12 ____ |
| 3. Aspen/birch   |  |         |
| Light – Sparse or mature aspen with grass/forbs under story  |  | 1 ____  |
| Medium – Aspen/birch intermixed with scattered conifers  |  | 3 ____  |
| Heavy – Decadent aspen/birch with standing and fallen dead and intermixed conifers                       |  | 5 ____  |
| 4. Oak/hardwood brush  |  |         |
| Light – Patchy oak with less than 25% of the area covered with grass                                     |  | 1 ____  |
| Medium – Mature oak with scattered (less than 10%) conifer   |  | 3 ____  |
| Heavy – Continuous oak brush covering more than 50% of area with grass                                   |  | 5 ____  |

**C. Topography (Slope Hazard Rating)**

- 8% or less 1 \_\_\_\_\_
- More than 8%, but less than 20% 4 \_\_\_\_\_
- 20% or more, but less than 30% 7 \_\_\_\_\_
- 30% or more 10 \_\_\_\_\_

**D. Fire Protection-Water Source**

- 1000 GPM hydrant within 500 feet 1 \_\_\_\_\_
- Hydrant farther than 500 feet or draft site 2 \_\_\_\_\_
- Water source 20 min. or less, round trip 5 \_\_\_\_\_
- Water source farther than 20 min., and 45 min. or less, round trip 7 \_\_\_\_\_
- Water source farther than 45 min., round trip 10 \_\_\_\_\_

**E. Fire Department Response Time (Type I Engine)**

- Less than 15 minutes 1 \_\_\_\_\_
- 15 to 30 minutes 5 \_\_\_\_\_
- More than 30 minutes 10 \_\_\_\_\_

**F. Survivable Space**

- 70% or more of the site 1 \_\_\_\_\_
- 30% or more, but less than 70% of site 10 \_\_\_\_\_
- Less than 30% of site 20 \_\_\_\_\_

**G. Existing Building Roofing Material**

- Fire Proof 1 \_\_\_\_\_
- Resistive 5 \_\_\_\_\_
- Non-Fire Rated 20 \_\_\_\_\_

**H. Existing Building Construction Materials**

- Noncombustible siding/deck 1 \_\_\_\_\_
- Noncombustible Siding/combustible deck 5 \_\_\_\_\_
- Combustible siding and deck 10 \_\_\_\_\_

**I. Utilities (gas and/or electric)**

- All underground utilities 1 \_\_\_\_\_
- One underground, one aboveground 3 \_\_\_\_\_
- All aboveground 5 \_\_\_\_\_

**Total** \_\_\_\_\_

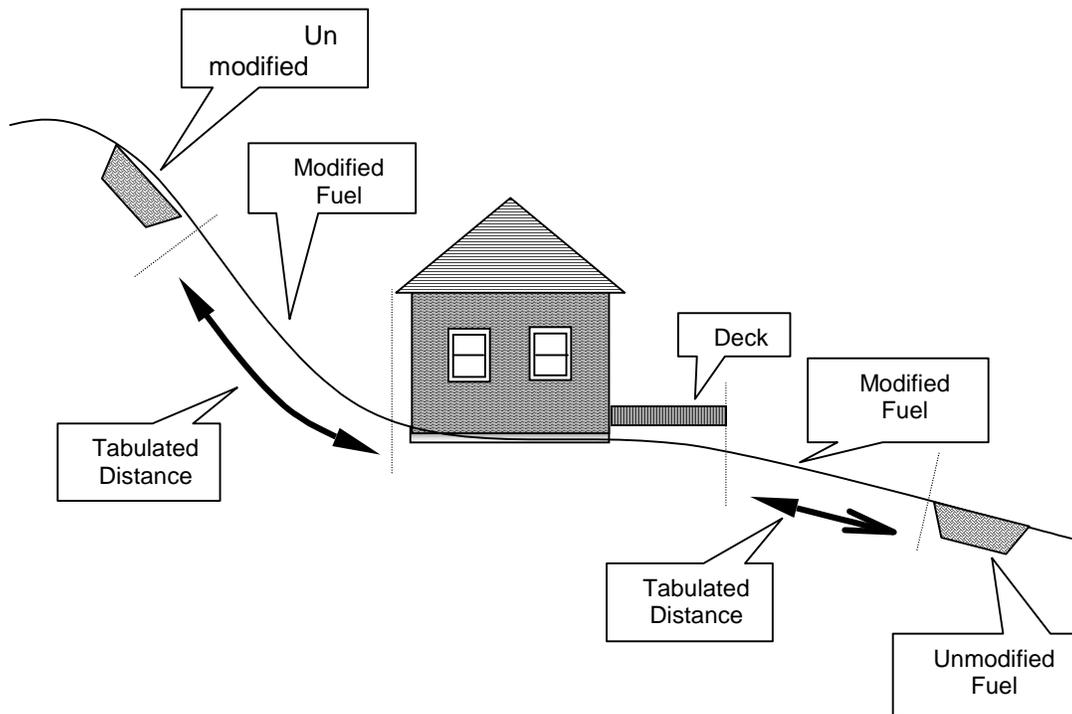
**Individual Structure Rating**  
**(Sum of B, C, F) Total** \_\_\_\_\_  
 Low 4 – 20  
 High 21 – 28  
 Extreme 29 – 42

**Overall Community Rating**  
 Low Hazard 32-39  
 Moderate Hazard 40-59  
 High Hazard 60-74  
 Extreme Hazard 75-150

## REQUIRED SURVIVABLE SPACE

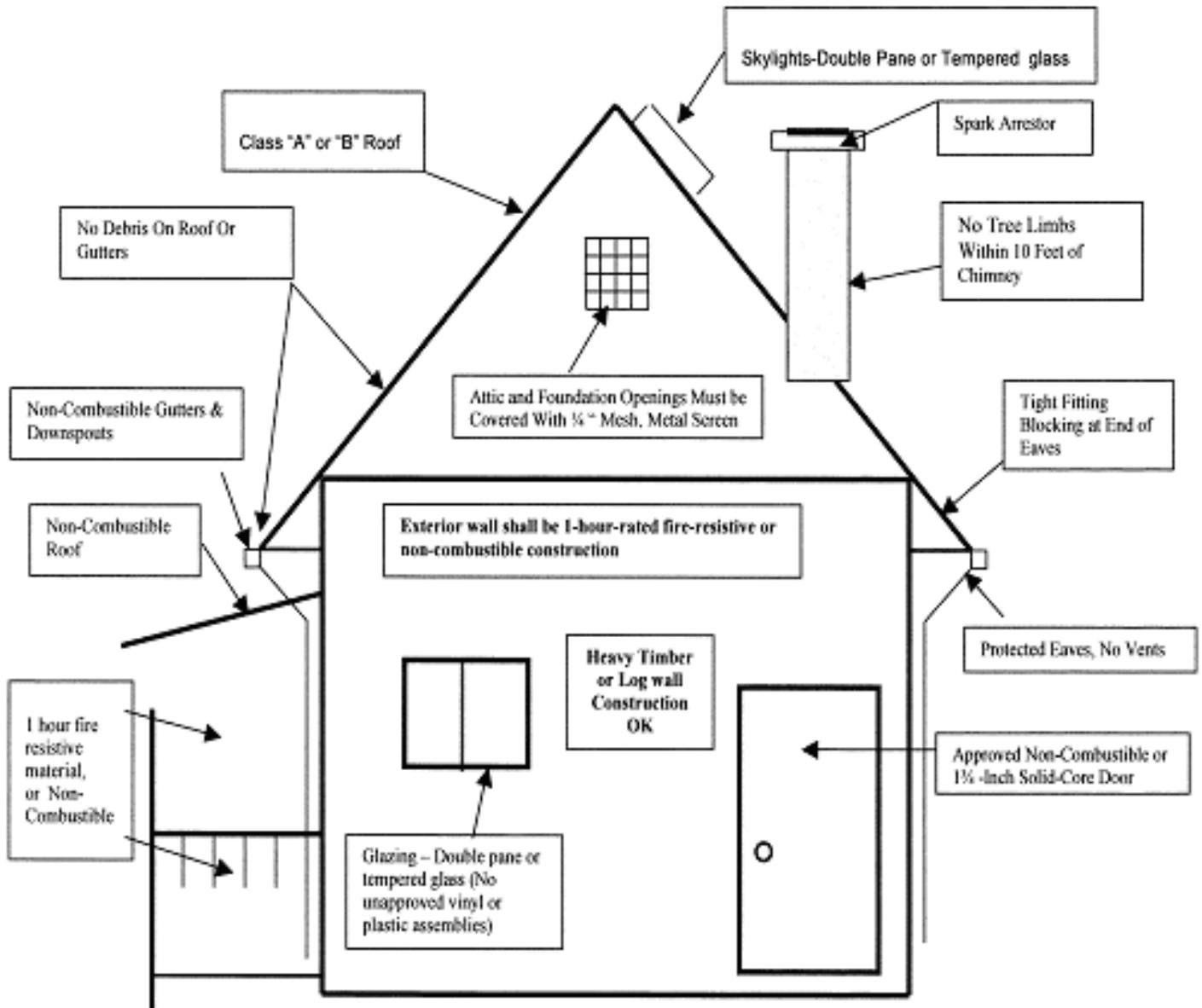
COMBINED SCORE B & C FORM 502	
URBAN-WILDLAND INTERFACE AREA	FUEL MODIFICATION DISTANCE
0-8	100-feet
9-12	150-feet
13+	200-feet

Moderate hazard  
 Combined score of <8  
 High hazard  
 Combined score of 8 to 12  
 Extreme hazard  
 Combined score of >12  
 For down slope side of structure add 25% to fuel modification distance



**MEASUREMENTS OF FUEL MODIFICATION DISTANCE**

## IGNITION-RESISTIVE CONSTRUCTION



**No vinyl or plastic handrails on decks unless approved & fire rated**

This plan has been reviewed and met the approval of by local agencies that enter into collaborative efforts to reduce the risk from wildfire for non-federal and federal land in Lawrence County.

<b>Approved By:</b>	<b>Representative:</b>	<b>Date:</b>
Lawrence County Commission:	_____	_____
Brownsville Volunteer Fire Department:	_____	_____
Deadwood Volunteer Fire Department:	_____	_____
Lead Volunteer Fire Department:	_____	_____
Nemo Volunteer Fire Department:	_____	_____
Rochford Volunteer Fire Department:	_____	_____
Spearfish Volunteer Fire Department:	_____	_____
Spearfish Canyon Volunteer Fire Department:	_____	_____
St. Onge Volunteer Fire Department:	_____	_____
Sturgis Volunteer Fire Department:	_____	_____
Whitewood Volunteer Fire Department:	_____	_____

<b>Reviewed By:</b>	<b>Representative:</b>	<b>Date:</b>
USDI Bureau of Land Management:	_____	_____
USDA Forest Service		
South Dakota Department of Agriculture:	_____	_____
Wildland Fire Suppression Division	_____	_____
Resource Conservation And Forestry Division	_____	_____

# Glossary

**CAR**— Community at Risk.

**Canopy Base Height**—The distance from the ground to where the canopy begins.

**Community**—A group of people living in the same locality and under the same government.

**Community At Risk**— A group of homes and other structures with basic infrastructure in an area that is at risk from uncontrolled wildfire.

**Community Wildfire Protection Plan**—A document that addresses the needs of the people involved in its development. Issues such as wildfire response, hazard mitigation, community preparedness, and structure protection may be covered topics.

**Crowning Index**—Conditions needed for fire to spread through the canopy.

**Crown Fire**—A wildfire that spreads across the tops, (crowns), of trees, more or less independent of any fire on the ground.

**Dry Hydrant**—A non-pressurized pipe connected to a water source that can be accessed by a fire protection agency to draft water.

**Hazard**—A fuel complex defined by kind arrangement volume, condition and location that forms a special threat of ignition or of suppression difficulty.

**HFRA**— Healthy Forest Restoration Act; 2003.

**Fire Regime Condition Class 3** —This term means the condition class description developed by the USDA Forest Service Rocky Mountain Research Station in the Development of Coarse-Scale Spatial Data for Wildland Fire and Fuel Management (RMRS-GTR-87, [http://www.fs.fed.us/rm/pubs/rmrs\\_gtr87.html](http://www.fs.fed.us/rm/pubs/rmrs_gtr87.html)), dated April 2000 (including any subsequent revisions).

Fire regimes on the land have been significantly altered from historical ranges. A high risk exists of losing key ecosystem components from fire. Fire frequencies have departed from historical frequencies by multiple return intervals, resulting in dramatic changes to the size, frequency, intensity, or severity of fires or landscape patterns. Values of vegetation attributes have been significantly altered from their historical ranges.

**Fire Regime I**—This term means an area that historically has had low-severity fires every 0 to 35 years that is located primarily in low-elevation forests of pine, oak, and pinyon-juniper.

**Fire Regime II**—This term means an area that historically has had stand-replacement-severity fires every 0 to 35 years that is located primarily in low- to mid-elevation rangeland, grassland, or shrub land.

**Fire Regime III**—This term means an area that historically has had mixed-severity fires every 35 to 100 years that is located primarily in forests of mixed conifer, dry Douglas-fir, or wet ponderosa pine.

**Firewise Construction**—The use of materials and systems in the design and construction of a building or structure to safeguard against the spread of fire within the building or structure as well as the spread of fire to other buildings or structures or to adjacent natural areas.

**Firewise Landscaping**—Vegetation placed around a home or other structure in a manner so as to reduce the exposure of the building to an encroaching wildfire, or slow/inhibit the spread of fire from an adjacent wildland area to the building or from the building to the wildland area.

**Fuel**—Native vegetation that is available to burn in a wildfire.

**Home Ignition Zone**—See Survivable Space.

**Infrastructure**—The physical support systems of a subdivision, including roads, power lines and central water and sewage.

**Ladder Fuels**—Fuels that provide vertical continuity between strata, thereby allowing fire to move from surface fuels to the crowns of trees, (or to structures), with relative ease.

**Municipal Watershed**—A community water system “that serves at least 15 service connections used by year-round residents of the area served by the system; or regularly serves at least 25 year-round residents” (Safe Drinking Water Act, Section 1401, 42 U.S.C.A. 300f.(15)).

**Municipal Water Supply System**—This term means the: Reservoirs, canals, ditches, flumes, laterals, pipes, pipelines, and other surface facilities and systems constructed or installed for the collection, impoundment, storage, transportation, or distribution of drinking water.

**NFP**—National Fire Plan; August 2000.

**Outcrop**—A part of a geologic formation that is exposed to the land surface.

**Prescribed Burning/Prescribed Fires**—Carefully controlled fires set by land managers to reduce hazardous accumulations of wildland vegetation, (fuel), control forest insect and diseases, improve forage for livestock, improve wildlife habitat and maintain healthy ecosystems.

**Risk**—Activities or things that provide a source of heat sufficient to result in a fire ignition.

**Survivable Space**—The area between wildland fuels and structures, (typically a width of 30 feet or more), that allows firefighters to protect the structure from wildfire. In the absence of firefighters, this safety zone increases the likelihood that the structure will survive on its own.

**Shelterbelt**—A barrier of trees and shrubs that protects against the wind and reduces erosion.

**Torching Index**—The conditions needed to torch individual trees.

**Understory**—An underlying layer of vegetation, especially the plants that grow beneath a forest's canopy.

**Value**—Natural resources, improvements, or other values that may be jeopardized or lost if a fire occurs.

**Wildfire**—A fire that burns out of control in forest or wildland areas damaging or destroying natural resources and sometimes threatening or destroying life and property.

**Wildland-Urban Interface**—A zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels.

**Wildland-Urban Interface Buffer Zones (½, 1½ and 3-mile)** —Geographic areas centered around values at risk that help develop mitigation strategies to reduce the risk from wildfire.

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