Chapter 5: Treatment Recommendations

5 Administration & Implementation Strategy

Critical to the implementation of this Community Wildfire Protection Plan will be the identification of, and implementation of, an integrated schedule of treatments targeted at achieving an elimination of the lives lost, and reduction in structures destroyed, infrastructure compromised, and unique ecosystems damaged that serve to sustain the way-of-life and economy of Yellowstone County and the region. Since there are many land management agencies and thousands of private landowners in Yellowstone County, it is reasonable to expect that differing schedules of adoption will be made and varying degrees of compliance will be observed across all ownerships.

Yellowstone County encourages the philosophy of instilling disaster resistance in normal day-to-day operations. By implementing plan activities through existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's design or program.

The federal land management agencies in Yellowstone County, specifically Bureau of Land Management, are participants in this planning process and have contributed to its development. Where available, their schedule of land treatments have been considered in this planning process to better facilitate a correlation between their identified planning efforts and the efforts of Yellowstone County.

All risk assessments were made based on the conditions existing during 2005, thus, the recommendations in this section have been made in light of those conditions. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations annually to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

As part of the Policy of Yellowstone County in relation to this planning document, the Community Wildfire Protection Plan should be reviewed annually at a special meeting of the Yellowstone County Commissioners, open to the public and involving all municipalities/jurisdictions, where action items, priorities, budgets, and modifications can be made or confirmed. A written review of the plan should be prepared (or arranged) by the Chairman of the County Commissioners, detailing plans for the year's activities, and made available to the general public ahead of the meeting (in accord with the Montana Open Public Meeting Laws). Amendments to the plan should be detailed at this meeting, documented, and attached to the formal plan as an amendment to the Community Wildfire Protection Plan. Total re-evaluation of this plan should be made on the 5th anniversary of its acceptance, and every 5-year period following.

5.1 Prioritization of Mitigation Activities

Prioritization of projects will occur at the County, City, agency, and private levels. Differing prioritization processes will occur, however, the county and cities will adopt the following prioritization process, as indicated through the adoption of this plan by each municipality.

The prioritization process will include a special emphasis on cost-benefit analysis review. The process will reflect that a key component in funding decision is a determination that the project will provide an equivalent or more in benefits over the life of the project when compared with the

costs. Projects will be administered by county and local jurisdictions with overall coordination provided by the County Disaster and Emergency Services Director.

County Commissioners and the elected officials of all jurisdictions will evaluate opportunities and establish their own unique priorities to accomplish mitigation activities where existing funds and resources are available and there is community interest in implementing mitigation measures. If no federal funding is used in these situations, the prioritization process may be less formal. Often the types of projects that the County can afford to do on their own are in relation to improved codes and standards, department planning and preparedness, and education. These types of projects may not meet the traditional project model, selection criteria, and benefit-cost model. The County will consider all pre-disaster mitigation proposals brought before the County Commissioners by department heads, city officials, fire districts and local civic groups.

When federal or state funding is available for hazard mitigation, there are usually requirements that establish a rigorous benefit-cost analysis as a guiding criterion in establishing project priorities. The county will understand the basic federal grant program criteria which will drive the identification, selection, and funding of the most competitive and worthy mitigation projects. FEMA's three grant programs (the post-disaster Hazard Mitigation Grant Program, the pre-disaster Flood Mitigation Assistance and Pre-Disaster Mitigation grant programs) that offer federal mitigation funding to state and local governments all include the benefit-cost and repetitive loss selection criteria.

The prioritization of projects will occur annually and be facilitated by the County Disaster and Emergency Services Director to include the County Commissioner's Office, City Mayors and Councils, Fire District Chiefs and Commissioners, agency representatives (USFS, BLM, WA DNR, BIA, etc.). The prioritization of projects will be based on the selection of projects which create a balanced approach to pre-disaster mitigation which recognizes the hierarchy of treating in order (highest first):

- People and Structures
- Infrastructure
- Local and Regional Economy
- Traditional Way of Life
- Ecosystems

5.1.1 Prioritization Scheme

A numerical scoring system is used to prioritize projects. This prioritization serves as a guide for the county when developing mitigation activities. This project prioritization scheme has been designed to rank projects on a case by case basis. In many cases, a very good project in a lower priority category could outrank a mediocre project in a higher priority. The county mitigation program does not want to restrict funding to only those projects that meet the high priorities because what may be a high priority for a specific community may not be a high priority at the county level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying reasons and criteria is a necessity for a functional mitigation program at the county and community level.

To implement this case by case concept, a more detailed process for evaluating and prioritizing projects has been developed. Any type of project, whether county or site specific, will be prioritized in this more formal manner.

To prioritize projects, a general scoring system has been developed. This prioritization scheme has been used in statewide all hazard mitigations plans. These factors range from cost-benefit ratios, to details on the hazard being mitigated, to environmental impacts.

Since planning projects are somewhat different than non-planning projects when it comes to reviewing them, different criteria will be considered, depending on the type of project.

The factors for the non-planning projects include:

- Benefit / Cost
- Population Benefit
- Property Benefit
- Economic Benefit
- Project Feasibility (environmentally, politically, socially)
- Hazard Magnitude/Frequency
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development
- Potential project effectiveness and sustainability

The factors for the planning projects include:

- Benefit / Cost
- Vulnerability of the community or communities
- Potential for repetitive loss reduction
- Potential to mitigate hazards to future development

Since some factors are considered more critical than others, two ranking scales have been developed. A scale of 1-10, 10 being the best, has been used for cost, population benefit, property benefit, economic benefit, and vulnerability of the community. Project feasibility, hazard magnitude/frequency, potential for repetitive loss reduction, potential to mitigate hazards to future development, and potential project effectiveness and sustainability are all rated on a 1-5 scale, with 5 being the best. The highest possible score for a non-planning project is 65 and for a planning project is 30.

The guidelines for each category are as follows:

5.1.1.1 Benefit / Cost

The analysis process will include summaries as appropriate for each project, but will include benefit / cost analysis results. Projects with a negative benefit / cost analysis result will be ranked as a 0. Projects with a positive Benefit / Cost analysis will receive a score equal to the projects Benefit / Cost Analysis results divided by 25. Therefore a project with a BC ratio of 125:1 would receive 5 points, a project with a BC ratio of 250:1 (or higher) would receive the maximum points of 10.

5.1.1.2 Population Benefit

Population Benefit relates to the ability of the project to prevent the loss of life or injuries. A ranking of 10 has the potential to impact 90% or more of the people in the municipality (county, city, or district). A ranking of 5 has the potential to impact 50% of the people, and a ranking of 1 will not impact the population. The calculated score will be the percent of the population impacted positively multiplied by 10. In some cases, a project may not directly provide population benefits, but may lead to actions that do, such as in the case of a study. Those

projects will not receive as high of a rating as one that directly effects the population, but should not be considered to have no population benefit.

5.1.1.3 Property Benefit

Property Benefit relates to the prevention of physical losses to structures, infrastructure, and personal property. These losses can be attributed to potential dollar losses. Similar to cost, a ranking of 10 has the potential to save $20,000,000 or more in losses. Property benefit of less than $20,000,000 will receive a score of the benefit divided by $20,000,000 (a ratio below $20 million). The calculated score will be the percent of the population impacted positively multiplied by 10. Therefore, a property benefit of $6,000,000 would receive a score of 3. In some cases, a project may not directly provide property benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly effects property, but should not be considered to have no property benefit.

5.1.1.4 Economic Benefit

Economic Benefit is related to the savings from mitigation to the economy. This benefit includes reduction of losses in revenues, jobs, and facility shut downs. Since this benefit can be difficult to evaluate, a ranking of 10 would prevent a total economic collapse, a ranking of 5 could prevent losses to about half the economy, and a ranking of 1 would not prevent any economic losses. In some cases, a project may not directly provide economic benefits, but may lead to actions that do, such as in the case of a study. Those projects will not receive as high of a rating as one that directly affects the economy, but should not be considered to have no economic benefit.

5.1.1.5 Vulnerability of the Community

For planning projects, the vulnerability of the community is considered. A community that has a high vulnerability with respect to other jurisdictions to the hazard or hazards being studied or planned for will receive a higher score. To promote planning participation by the smaller or less vulnerable communities in the state, the score will be based on the other communities being considered for planning grants. A community that is the most vulnerable will receive a score of 10, and one that is the least, a score of 1.

5.1.1.6 Project Feasibility (Environmentally, Politically & Socially)

Project Feasibility relates to the likelihood that such a project could be completed. Projects with low feasibility would include projects with significant environmental concerns or public opposition. A project with high feasibility has public and political support without environmental concerns. Those projects with very high feasibility would receive a ranking of 5 and those with very low would receive a ranking of 1.

5.1.1.7 Hazard Magnitude/Frequency

The Hazard Magnitude/Frequency rating is a combination of the recurrence period and magnitude of a hazard. The severity of the hazard being mitigated and the frequency of that event must both be considered. For example, a project mitigating a 10-year event that causes significant damage would receive a higher rating than one that mitigates a 500-year event that causes minimal damage. For a ranking of 5, the project mitigates a high frequency, high

magnitude event. A 1 ranking is for a low frequency, low magnitude event. Note that only the damages being mitigated should be considered here, not the entire losses from that event.

5.1.1.8 Potential for repetitive loss reduction

Those projects that mitigate repetitive losses receive priority consideration here. Common sense dictates that losses that occur frequently will continue to do so until the hazard is mitigated. Projects that will reduce losses that have occurred more than three times receive a rating of 5. Those that do not address repetitive losses receive a rating of 1.

5.1.1.9 Potential to mitigate hazards to future development

Proposed actions that can have a direct impact on the vulnerability of future development are given additional consideration. If hazards can be mitigated on the onset of the development, the county will be less vulnerable in the future. Projects that will have a significant effect on all future development receive a rating of 5. Those that do not affect development should receive a rating of 1.

5.1.1.10 Potential project effectiveness and sustainability

Two important aspects of all projects are effectiveness and sustainability. For a project to be worthwhile, it needs to be effective and actually mitigate the hazard. A project that is questionable in its effectiveness will score lower in this category. Sustainability is the ability for the project to be maintained. Can the project sustain itself after grant funding is spent? Is maintenance required? If so, are or will the resources be in place to maintain the project. An action that is highly effective and sustainable will receive a ranking of 5. A project with effectiveness that is highly questionable and not easily sustained should receive a ranking of 1.

5.1.1.11 Final ranking

Upon ranking a project in each of these categories, a total score can be derived by adding together each of the scores. The project can then be ranking high, medium, or low based on the project thresholds of:

Project Ranking Priority Score Non-Planning Projects

- High 40-65
- Medium 25-39
- Low 9-24

Project Ranking Priority Score Planning Projects

- High 18-30
- Medium 12-17
- Low 1-11

5.2 Possible Fire Mitigation Activities

As part of the implementation of fire mitigation activities in Yellowstone County, a variety of management tools may be used. Management tools include but are not limited to the following:

- Homeowner and landowner education
- Building code changes for structures and infrastructure in the WUI

- Home site defensible zone through fuels modification
- Community defensible zone fuels alteration
- Access improvements
- Access creation
- Emergency response enhancements (training, equipment, locating new fire stations, new fire departments, merging existing departments)
- Regional land management recommendations for private, state, and federal landowners

Maintaining private property rights will continue to be one of the guiding principles of this plan's implementation. Sound risk management is a foundation for all fire management activities. Risks and uncertainties relating to fire management activities must be understood, analyzed, communicated, and managed as they relate to the cost of either doing or not doing an activity. Net gains to the public benefit will be an important component of decisions.

5.2.1 Existing Practices That Should Continue

Yellowstone County currently is implementing many projects and activities that, in their absence, could lead to increased wildland fire loss potential. By enumerating some of them here, it is the desire of the authors to point out successful activities.

- Existing rural addressing efforts have aided emergency responses well.
- The City of Billings currently operates the 911 Dispatch Center, which not only handles law enforcement and emergency medical calls, but also provides dispatch service to all of the County's fire companies. For large-scale incidents, the County Emergency Operations Center is activated.
- Automatic mutual aid is dispatched in extreme dry wildland conditions and stage 2 restrictions.
- Land management agencies within the county are conducting fuel reduction projects in response to increasing concerns of fire hazard in WUI areas.
- Several of the rural fire departments have begun implementing educational and awareness programs within their jurisdictions as their budgets allow. Many of these programs are geared towards schools; however, some have gone as far as door-to-door campaigns in high risk areas.

5.3 WUI Safety & Policy

Wildfire mitigation efforts must be supported by a set of policies and regulations at the county level that maintain a solid foundation for safety and consistency. The recommendations enumerated here serve that purpose. Because these items are regulatory in nature, they will not necessarily be accompanied by cost estimates. These recommendations are policy related and therefore are recommendations to the appropriate elected officials; debate and formulation of alternatives will serve to make these recommendations suitable and appropriate.

5.3.1 Overall Goals

Reduce Yellowstone County's wildfire risk by mitigating hazards affecting communities through improvement of County policies and enhancement of individual and public safety. Specific goals outlined by the County include:

- Educate the public regarding the existence of eminent hazards and how to respond during a wildfire event.
- Improve emergency response capabilities.
- Develop policies and standards concerning new building and housing projects that will reduce their exposure to fire risk factors.

5.3.2 Proposed Activities

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.a: Adoption and enforcement of International Building Codes and/or more stringent hazard--related building code provisions.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (24/30)	**Yellowstone County Commissioners**, Yellowstone County Building Department, City of Billings, City of Laurel, Town of Broadview, and the County Fire Warden.	**2006**: Annual review of IBC updates and relevance to hazards in the County.
5.1.b: Develop County policy concerning building materials used in high-risk WUI areas on existing structures and new construction.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (30/30)	**County Commissioners Office** in cooperation with Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, and Huntley Project FSA.	**2006**: Consider and develop policy to address construction materials for homes and businesses located in high wildfire risk areas. Specifically, a County policy concerning wooden roofing materials and flammable siding, especially where adjacent to heavy wildland fuels.
5.1.c: Develop County policy requiring the installation of dry hydrants in subdivisions with 5 or more dwellings.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (24/30)	**County Commissioners Office and City and County Planning Department** in cooperation with Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, and Huntley Project FSA.	**2006**: Consider and develop policy to address the need for additional water resources for homes and businesses located in high wildfire risk areas. Specifically, a County policy requiring the installation of dry hydrants in subdivisions with 5 or more dwellings, especially where adjacent to heavy wildland fuels.

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.d: Begin distributing "New Code of the West" pamphlets with sub-division permit requests.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (40/65)	**County Commissioners, City and County Planning Departments**, City of Billings, City of Laurel, and Town of Broadview.	• **2006**: Obtain copyrights to "New Code of the West" pamphlet. • **2006**: Distribute pamphlets.
5.1.e: Develop a policy to enforce "No Burning" restrictions in specified high risk subdivisions.	**Protection of people and structures** by reducing the fire ignition risk in high-risk areas. Project Ranking Priority Score: **High** (26/30)	**County Commissioners, City and County Planning Departments**, City of Billings, City of Laurel, Town of Broadview, and rural subdivision associations.	• **2006**: Consider and develop policy to address burning regulations for subdivisions and population clusters located in high wildfire risk areas. Specifically, a County policy concerning a "No Burning" restriction where subdivisions are juxtaposed near heavy wildland fuels
5.1.f: Review need to inspect and enforce access and water issues in new subdivisions and individual homes.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (27/30)	**County Commissioners**, City and County Planning Departments, County Fire Warden, City of Billings, City of Laurel, and Town of Broadview.	• **2006-07**: Study need for inspections and enforcement of access and water issues and other programmatic responses. • **2007**: Review need for inspector and potential duties.
5.1.g: Develop county policy concerning access in moderate to high-risk WUI areas where subdivisions are built to insure adequate ingress and egress during wildfire emergencies.	**Protection of people and structures** by improving the ability of emergency response personnel to respond to threatened homes in high-risk areas. Project Ranking Priority Score: **High** (30/30)	**County Commissioners Office and Planning Board** in cooperation with Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, and Huntley Project FSA.	**2006**: Consider and develop policy to address access language for homes and businesses located in moderate to high wildfire risk areas. Specifically, a County policy concerning road widths, turning radii, and number of access points.

Table 5.1. WUI Action Items in Safety and Policy.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.1.h: Develop a county policy to support grant applications for projects resulting from this plan.	**Protection of people and structures** by improving the ability of residents and organizations to implement sometimes costly projects. Project Ranking Priority Score: **High** (30/30)	**County Commissioners Office**	**Ongoing activity:** Support grant applications as requested in a manner consistent with applications from residents and organizations in Yellowstone County.

5.4 People and Structures

The protection of people and structures will be tied together closely as the loss of life in the event of a wildland fire is generally linked to a person who could not, or did not, flee a structure threatened by a wildfire. The other incident is a firefighter who suffers the loss of life during the combating of a fire. Many of the recommendations in this section will define a set of criteria for implementation while others will be rather specific in extent and application.

Many of the recommendations in this section involve education to increase awareness and teach mitigation strategies to the residents of Yellowstone County. These recommendations stem from a variety of factors including items that became obvious during the analysis of the public surveys, discussions during public meetings, and observations about choices made by residents living in the Wildland-Urban Interface. Unlike many other counties across the west, Yellowstone County residents demonstrated a higher awareness of wildfire risk factors such as the responses to the homeowner survey questions concerning home risk factors. The results of that survey pointed to a recognition of risk very similar to what “fire professionals” estimated in the county. However, while the risk was recognized, it was still documented, giving specialists the opportunity to concentrate efforts on conveying methods of reducing risk instead of just learning how to identify it.

- Homeowners in the public mail survey ranked their home site wildfire risk factors very similar to the results of a random sample of home rankings completed by fire mitigation specialists.
- Discussions with the general public indicated an awareness of wildland fire risk, but they could not specifically identify risk factors.
- More than half (61%) of the respondents to the public mail survey indicated that they want to participate in educational opportunities focused on the WUI and what they can do to increase their home’s chances of surviving a wildfire.

In addition to those items enumerated in Table 5.1, residents and policy makers of Yellowstone County should recognize certain factors that exist today, that in their absence would lead to an increase in the risk factors associated with wildland fires in the WUI of Yellowstone County. These items listed below should be encouraged, acknowledged, and recognized for their contributions to the reduction of wildland fire risks:

- **Livestock Grazing** in and around the communities of Yellowstone County has led to a reduction of many of the fine fuels that would have been found in and around the

communities and in the wildlands of Yellowstone County. Domestic livestock not only eat these grasses, forbs, and shrubs, but also trample certain fuels to the ground where decomposition rates may increase. Livestock ranchers tend their stock, placing resource professionals into the forests and rangelands of the area where they may observe ignitions, or potentially risky activities. There are ample opportunities throughout the County to increase grazing. This could contribute to the economic output of the county as well as reduce the fuel loading. Livestock grazing in this region should be encouraged into the future as a low cost, positive tool of wildfire mitigation in the wildland-urban interface and in the wildlands.

- **Forest Health** in Yellowstone County has been greatly impacted by the continuation of drought conditions over the last decade. Drought related stress on many of the forest stands has also let to a widespread beetle infestation, which is further increasing the rate of mortality, particularly in the ponderosa pine. Thinning operations focused on removing dead and dying trees would help reduce the wildfire hazard; however, there is little forest resource professionals or others can do to help prevent further mortality caused by the lack of water.
- **Agriculture** is a significant component of Yellowstone County's economy. The original conversion of these lands to agriculture from rangeland, was targeted at the most productive soils and juxtaposition to infrastructure. Many of these productive ecosystems were consequently also at some of the highest risk to wildland fires because biomass accumulations increased in these productive landscapes. The result today, is that much of the rangeland historically prone to frequent fires, has been converted to agriculture, which is at a much lower risk than prior to its conversion. The preservation of a viable agricultural economy in Yellowstone County is integral to the continued management of wildfire risk in this region.

5.4.1 Overall Goals

Reduce Yellowstone County's wildfire risk by mitigating hazards affecting communities through direct improvement of personal and structure safety. Specific goals outlined by the County include:

- Improve the ability of communities to carry out necessary operations during emergency events.
- Educate the public regarding the existence of fire risk and how to respond during a wildfire event.
- Reduce the fire risk around homes and communities by maintaining a defensible space.
- Improve access and reduce the fire risk on major roads throughout the County.

5.4.2 Proposed Activities

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.a: Youth and Adult Wildfire Educational Programs and Professional Development Training.	**Protect people and structures** by increasing awareness of WUI risks, how to recognize risk factors, and how to modify those factors to reduce risk. Project Ranking Priority Score: **High** (30/30)	Cooperative effort including: • Montana State University Extension Service • Montana Department of Natural Resources and Conservation • Bureau of Land Management • Local School Districts • U.S. Forest Service • Bureau of Indian Affairs, Crow Agency • Yellowstone County Fire Departments, Fire Districts, and Fire Service Areas	Evaluate effectiveness of currently funded County education programs. If possible, use existing educational program materials and staffing. These programs may need reformatted using Firewise materials. Formal needs assessments should be responsibility of Extension Service faculty and include the development of an integrated WUI educational series by year 3 (2008). Costs initially to be funded through existing budgets for these activities to be followed with grant monies to continue the programs as identified in the formal needs assessment. Detailed information on home defensible space requirements is contained on the Firewise CD, which can be purchased and personalized by the County. The CD costs $2,500.

Public Education Project Areas	Project Cost
Pine Hills Public Education Project Area Briarwood Public Education Project Area Secret Valley Public Education Project Area Echo Canyon Public Education Project Area	Public education targeted at specific communities or subdivisions is usually hosted and/or sponsored by the fire department, fire service area, or other related organization with jurisdiction in that area. Overall cost of educational classes is highly dependent on attendance and types of materials used; however, we can estimate that on average a class would cost $2,500. If other more time intensive or more individual citizen oriented methods are used the cost would likely increase due to the increase in manpower.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.b: Wildfire risk assessments of homes in identified communities.	**Protect people and structures** by increasing awareness of specific risk factors of individual home sites in the at-risk landscapes. Only after these are completed can home site treatments follow. Project Ranking Priority Score: **Prioritized with 5.2.c.**	To be implemented by **County Commissioners Office** in cooperation with **Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, City of Billings, City of Laurel, and Town of Broadview**. Actual work may be completed by Wildfire Mitigation Consultants or trained volunteers.	• **Cost:** Approximately $100 per home site for inspection, written report, and discussions with the homeowners. • There are approximately 7,740 housing units outside of the High Density Urban WUI designation in Yellowstone County, roughly 5,031 (65%) of these structures would benefit from a home site inspection and budget determination for a total cost estimate of $503,100. • **Action Item:** Secure funding and contract to complete the inspections during years 1 & 2 (2006-07) • Home site inspection reports and estimated budget for each home site's treatments will be a requirement to receive funding for treatments through grants.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.c: Home Site WUI Treatments	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding homes in the WUI of Yellowstone County. Project Ranking Priority Score: **High** (42/65)	**County Commissioners** in cooperation with a Fire Mitigation Consulting company , Farm Service Agency, Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, City of Billings, City of Laurel, Town of Broadview, and local subdivision and community associations. *Complete concurrently with 5.2.b.*	• Actual funding level will be based on the outcomes of the home site assessments and cost estimates • **Estimate** that treatments will cost approximately $900 per home site for a defensible space of roughly 150'. Approximately 3,483 (45%) home site treatments throughout the County would add up to an estimated cost of $3,134,700. • Home site treatments can begin after the securing of funding for the treatments and immediate implementation in 2006 and will continue from year 1 through 5 (2010). • Plan and implement an ongoing fuels reduction plan on Conservation Reserve Program lands surrounding home sites.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.d: Community Defensible Zone WUI Treatments, specifically in the Clapper Flats, Buffalo Trails, Rehberg Ranch Estates, Alkali Creek, Hills Estates, Indian Cliffs, Pleasant Hollow, Shadow Canyon, Cedar Ridge, White Buffalo, High Trails, and Emerald Hills subdivisions.	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding high risk communities in the WUI of Yellowstone County. Project Ranking Priority Score: **High** (50/65)	**County Commissioners** in cooperation with a Fire Mitigation Consultant, Farm Service Agency, Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, City of Billings, City of Laurel, Town of Broadview, and local subdivision and community associations.	• Actual funding level will be based on the outcomes of the home site assessments and cost estimates. • **Years 2-5 (2007-10):** Treat high risk wildland fuels from home site defensible space treatments (5.4.c) to an area extending 400 feet to 750 feet beyond home defensible spaces, where steep slopes and high accumulations of risky fuels exist. Should link together home treatment areas. Treatments should focus on high risk concentrations of fuels and not 100% of the area identified. To be completed only after or during the creation of home defensible spaces have been implemented. • Approximate average cost on a per structure basis is $500 depending on extent of home defensibility site treatments, estimate 1077 (total number of structures in project areas) homes in need of this type of treatment for a cost estimate of $538,500. • Plan and implement an ongoing fuels reduction plan on Conservation Reserve Program lands surrounding communities.
5.2.e: Maintenance of Home Site WUI Treatments	**Protect people, structures, and increase firefighter safety** by reducing the risk factors surrounding homes in the WUI of Yellowstone County. Project Ranking Priority Score: **Prioritized with 5.2.f.**	**County Commissioners Office** in cooperation with Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, and local home owners.	• Home site defensibility treatments must be maintained periodically to sustain benefits of the initial treatments. • Each site should be assessed 5 years following initial treatment • Estimated re-inspection cost will be $50 per home site on all sites initially treated or recommended for future inspections ($174,150) • Follow-up inspection reports with treatments as recommended years 5 through 10.

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs
5.2.f: Re-entry of Home Site WUI Treatments	**Protect people, structures, and increase firefighter safety** by reducing risk factors around homes in the WUI of Yellowstone County. Project Ranking Priority Score: **High** (47/65)	**County Commissioners Office** in cooperation with Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, and local home owners.	• Re-entry treatments will be needed periodically to maintain the benefits of the initial WUI home treatments. Each re-entry schedule should be based on the initial inspection report recommendations, observations, and changes in local conditions. Generally occurs every 5-10 years.
5.2.g: Implement proposed home defensible space projects.	**Protect people, structures, and firefighter safety** by decreasing the fire risk around homes and communities.	**Rural Fire Departments, County Commissioners, area residents, and private contractor.**	• **Year 1 (2005):** Locate funding source and conduct home site evaluations for structures in mapped project areas. Write project plans for individual landowners. • **Year 2 (2006):** Continue to work with landowners to implement agreed upon project plans.

Defensible Space Project Areas	Acres	Project Cost	Priority Ranking
Rehberg Ranch Estates Defensible Space Treatment Area	1110.1	Approximately 92 structures at $900/per structure constitutes an estimated cost of $82,800.	**High** (40/65)
Clapper Flats Defensible Space Treatment Area	3463.0	Approximately 55 structures at $900/per structure constitutes an estimated cost of $49,500.	**Medium** (35/65)
Alkali Creek Defensible Space Treatment Area	448.6	Approximately 245 structures at $700/per structure constitutes an estimated cost of $171,500.	**High** (51/65)
Hills Estates Defensible Space Treatment Area	552.6	Approximately 13 structures at $500/per structure constitutes an estimated cost of $6,500.	**Medium** (38/65)
Buffalo Trails Defensible Space Treatment Area	7715.0	Approximately 138 structures at $900/per structure constitutes an estimated cost of $124,200.	**Medium** (38/65)
Indian Cliffs Defensible Space Treatment Area	228.0	Approximately 100 structures at $700/per structure constitutes an estimated cost of $70,000.	**High** (43/65)
Pleasant Hollow Defensible Space Treatment Area	2071.7	Approximately 86 structures at $900/per structure constitutes an estimated cost of $77,400.	**Medium** (36/65)

Table 5.2. WUI Action Items for People and Structures.

Action Item	Goals and Objectives	Responsible Organization	Action Items, Planning Horizon and Estimated Costs	
Cedar Ridge Defensible Space Treatment Area	2931.6		Approximately 47 structures at $700/per structure constitutes an estimated cost of $32,900.	**Medium** (35/65)
White Buffalo Defensible Space Treatment Area	319.3		Approximately 22 structures at $500/per structure constitutes an estimated cost of $11,000.	**Medium** (33/65)
High Trails Defensible Space Treatment Area	765.0		Approximately 25 structures at $500/per structure constitutes an estimated cost of $12,500.	**Medium** (39/65)
Emerald Hills Defensible Space Treatment Area	1710.0		Approximately 234 structures at $900/per structure constitutes an estimated cost of $210,600.	**High** (49/65)
Shadow Canyon Defensible Space Treatment Area	680.8		Approximately 20 structures at $500/per structure constitutes an estimated cost of $10,000.	**Medium** (33/65)

5.5 Infrastructure

Significant infrastructure refers to the communications, transportation (road and rail networks), energy transport supply systems (gas and power lines), and water supply that service a region or a surrounding area. All of these components are important to Yellowstone County. These networks are by definition a part of the Wildland-Urban Interface in the protection of people, structures, **infrastructure**, and unique ecosystems. Without supporting infrastructure a community's structures may be protected, but the economy and way of life lost. As such, a variety of components will be considered here in terms of management philosophy, potential policy recommendations, and on-the-ground activities.

Communication Infrastructure: This component of the WUI seems to be diversified across the county with multiple source and destination points, and a spread-out support network. Although site specific treatments will impact local networks directly, little needs to be done to insure the system's viability. To ensure good communications with the DNRC and the BLM resources a narrow band capability is needed and the radio's need to be able to be placed in "scan mode" to monitor cooperators frequencies.

Transportation Infrastructure (road and rail networks): This component of the WUI has some potential limitations in Yellowstone County. Specific infrastructure components have been discussed in this plan.

Ignitions along highways are significant and should be addressed as part of the implementation of this plan. Various alternatives from herbicides to intensive livestock grazing coupled with mechanical treatments have been suggested. These corridors should be further evaluated with alternatives implemented. A variety of approaches will be appropriate depending on the landowner, fuels present, and other factors. These ignitions are substantial and the potential risk of lives to residents in the area is significant.

Many roads in the county have limiting characteristics, such as narrow travel surfaces, sharp turning radii, low load limit bridges and cattle guards, and heavy accumulations of fuels adjacent to some roads. Some of these road surfaces access remote forestland and rangeland areas. While their improvements will facilitate access in the case of a wildfire, they are not necessarily the priority for treatments in the County.

Roads that have these inferior characteristics and access homes and businesses are the priority for improvements in the county. Specific recommendations for these roads are enumerated in Table 5.2.

Energy Transport Supply Systems (gas and power lines): A number of power lines crisscross Yellowstone County. Nearly all of these power lines cross over rangeland ecosystems. When fires ignite in these vegetation types, the fires tend to be fast moving and burn at relatively low intensities. However, there is a potential for high temperatures and low humidity with high winds to produce enough heat and smoke to threaten power line stability. Most power line corridors have been cleared of vegetation both near the wires and from the ground below. It is the recommendation of this Community Wildfire Protection Plan that this situation be evaluated annually and monitored but that treatments not be specifically targeted at this time. The use of these areas as "fuel breaks" should be evaluated further, especially in light of the treatments enumerated in this plan (e.g., intensive livestock grazing, mechanical treatments, and herbicide treatments).

Water Supply: In some of Montana's communities, water is derived from surface flow that is treated and piped to homes and businesses. When wildfires burn a region, they threaten these watersheds by the removal of vegetation, creation of ash and sediment. As such, watersheds

should be afforded the highest level of protection from catastrophic wildfire impacts. In Yellowstone County, water is supplied to many homes by municipal wells or single home and multiple home wells.

5.5.1 Overall Goals

Reduce Yellowstone County's fire risk by mitigating hazards affecting communities through enhancements of key infrastructure components. Specific goals outlined by the County include:

- Improve all components of the primary and secondary access routes.
- Educate the public regarding use of designated evacuation routes.
- Improve countywide communication systems.

5.5.2 Proposed Activities

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.a: Post "Emergency Evacuation Route" signs along the identified Primary and Secondary access routes in the County.	**Protection of people and structures** by informing residents and visitors of **significant infrastructure** in the County that will be maintained in the case of an emergency. Project Ranking Priority Score: **High** (51/65)	**County Commissioners** in cooperation with County Fire Warden, Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, City of Billings, City of Laurel, and Town of Broadview.	• Purchase of signs (2006). • Posting roads and make information available to residents of the importance of Emergency Routes

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.b: Access improvements of bridges, cattle guards, and limiting road surfaces.	**Protection of people, structures, infrastructure, and economy** by improving access for residents and fire fighting personnel in the event of a wildfire. Reduces the risk of a road failure that leads to the isolation of people or the limitation of emergency vehicle and personnel access during an emergency. Project Ranking Priority Score: **High** (48/65)	**County Road and Bridge Department** in cooperation with BLM, State of Montana (Dept of Transportation), BIA, and forestland or rangeland owners.	• **Year 1 (2006):** Update existing assessment of travel surfaces, bridges, and cattle guards in Yellowstone County as to location. Secure funding for implementation of this project (grants). • **Year 2 (2007):** Conduct engineering assessment of limiting weight restrictions for all surfaces (e.g., bridge weight load maximums). Estimate cost of $35,000 which might be shared between County, BLM, BIA, State, and private based on landownership associated with road locations. • **Year 2 (2007):** Post weight restriction signs on all crossings, copy information to rural fire departments and wildland fire protection agencies in affected areas. Estimate cost at roughly $10-$12,000 for signs and posting. • **Year 3 (2008):** Identify limiting road surfaces in need of improvements to support wildland fire fighting vehicles and other emergency equipment. Develop plan for improving limiting surfaces including budgets, timing, and resources to be protected for prioritization of projects (benefit/cost ratio analysis). Create budget based on full assessment.
5.3.c: Improve communications throughout the County by installing additional repeater towers and obtaining portable repeaters for emergency response personnel.	**Protection of people and structures** by providing improved communication resources. Project Ranking Priority Score: **High** (52/65)	**County Commissioners,** Billings Fire Department, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, Montana DNRC, and BLM.	• **Year 1 (2006):** Summarize existing communication capabilities and limitations. Identify costs to add towers and obtain equipment and locate funding opportunities. • **Year 2 (2007):** Acquire and install equipment as needed.
5.3.d: Erect a repeater tower on the site donated by the Conover Ranch	**Protection of people and structures** by providing improved communication	**Broadview FD #3**, Montana DNRC, and BLM.	• **Year 1 (2006):** Summarize existing communication capabilities and limitations. Identify cost to install tower and obtain equipment and locate funding opportunities.

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
near Broadview.	resources. Project Ranking Priority Score: **Medium** (36/65)		• **Year 2 (2007):** Acquire and install equipment as needed.
5.3.e: Fuel mitigation of the "Emergency Evacuation Routes" in the County to insure these routes can be maintained in the case of an emergency.	**Protection of people and structures** by providing residents and visitors with ingress and egress that can be maintained during an emergency. Project Ranking Priority Score: **High** (42/65)	**County Commissioners** in cooperation with County and State Road Departments, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, and Huntley Project FSA. .	• Full assessment of road defensibility and ownership participation (2005). • Implementation of projects (linked to item 5.3.b and 5.3.c).
5.3.f: Erect a repeater tower system to support the Shepherd Volunteer Fire Department and Shepherd community.	**Protection of people and structures** by providing improved communication resources. Project Ranking Priority Score: **High** (41/65)	**Shepherd Volunteer Fire Department** and community of Shepherd.	• **Year 1 (2006):** Summarize existing communication capabilities and limitations. Identify cost to install towers and obtain equipment and locate funding opportunities. • **Year 2 (2007):** Acquire and install equipment as needed.

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.3.g: Access improvements through roadside fuels management.	**Protection of people, structures, infrastructure, and economy** by improving access for residents and fire fighting personnel in the event of a wildfire. Allows for a road based defensible area that can be linked to a terrain based defensible areas.	**County Road and Bridge Department** in cooperation with US Forest Service, BLM, BIA Crow Agency, State of Montana (Dept. of Transportation), and forestland or rangeland owners.	• **Year 1 (2006):** Update existing assessment of roads in Yellowstone County as to location. Secure funding for implementation of this project (grants). • **Year 2 (2007):** Specifically address access issues listed below, plus recreation areas, and others identified in assessment. Target 100' extending from each side of the roadway. Total estimated cost for mowing in mostly grass vegetation is $126,244 based on estimate of $95 per treated acre. (Mileage and acreage estimates are for all main thoroughfares within the project area plus the main ingress/egress routes accessing the project area from a main road (usually a paved County road). • **Year 3 (2008):** Secure funding and implement projects to treat road-side fuels.

Roadside Fuels Treatments for Project Areas	Miles	Acres	Project Cost	Priority Ranking
Rehberg Ranch Estates Project Area	3.44	83.4	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $7,923 for this project area.	**High** (44/65)
Clapper Flats Project Area	3.14	76.0	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $7,720 for this project area.	**High** (42/65)
Alkali Creek Project Area	3.84	93.2	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $8,854 for this project area.	**High** (52/65)
Hills Estates Project Area	1.66	40.2	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $3,819 for this project area.	**Medium** (37/65)
Buffalo Trails Project Area	11.55	280.0	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $26,600 for this project area.	**High** (42/65)
Indian Cliffs Project Area	2.46	59.8	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $5,681 for this project area.	**High** (42/65)
Pleasant Hollow Project Area	8.71	211.1	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $20,054 for this project area.	**High** (40/65)
Cedar Ridge Project Area	2.97	72.0	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $6,840 for this project area.	**Medium** (39/65)
White Buffalo Project Area	2.46	59.6	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $5,662 for this project area.	**Medium** (36/65)
High Trails Project Area	2.42	58.7	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $5,577 for this project area.	**Medium** (38/65)
Emerald Hills Project Area	7.3	176.9	Mowing mostly grass within 100 feet from each side of the roadway cost approximately $95 per acre totaling $16,806 for this project area.	**High** (52/65)
Shadow Canyon Project Area	4.86	117.8	Mowing mostly grass within 100 feet from each side of the roadway cost	**Medium** (32/65)

Table 5.3. Infrastructure Enhancements.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
		approximately $95 per acre totaling $11,191 for this project area.	

5.6 Resource and Capability Enhancements

There are a number of resource and capability enhancements identified by the rural and wildland firefighting departments in Yellowstone County. All of the needs identified by the departments are in line with increasing the ability to respond to emergencies in the WUI and are fully supported by the planning committee.

Specific reoccurring themes of needed resources and capabilities include:

- Development of dry hydrants in rural locations
- Improved radio capabilities within each district and for mutual aid operations
- Retention and recruitment of volunteers
- Training and development of rural firefighters in structure and wildland fire
- Enhancement of equipment available for rural and city departments

Although additional, and specific, needs were enumerated by the departments in Yellowstone County, these items were identified by multiple departments and/or in the public meetings. The implementation of each issue will rely on either the isolated efforts of the rural fire departments or a concerted effort by the county to achieve equitable enhancements across all of the departments.

5.6.1 Overall Goals

Reduce Yellowstone County's fire risk by mitigating hazards affecting communities through direct enhancements of emergency response capabilities. Specific goals outlined by the County include:

- Obtain necessary equipment to effectively and safely prevent and respond to emergency situations.
- Enhance communications system throughout the County.
- Improve training of firefighters and all emergency personnel and provide incentives for trained firefighters and new recruits to stay with the force.

5.6.2 Proposed Activities

Table 5.4. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.a: Enhance radio availability in each department, link into existing dispatch, improve range within the region, and conversion to consistent standard of radio types.	**Protection of people and structures** by direct capability enhancements. Project Ranking Priority Score: **High** (59/65)	**Montana Department of Natural Resources and Conservation** in cooperation with County Commissioners, Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, Huntley Project FSA, and BLM,.	• **Year 1 (2006):** Summarize existing two-way radio capabilities and limitations. Identify costs to upgrade existing equipment and locate funding opportunities. • **Year 2 (20076):** Acquire and install upgrades as needed. • **Year 2-3 (2007-08):** Identify opportunities for radio repeater towers located in the region for multi-county benefits.
5.4.b: Retention of Volunteer Fire Fighters.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **High** (30/30)	**Rural and Wildland Fire Departments, Districts, and Fire Service Areas** working with broad base of county citizenry to identify options, determine plan of action, and implement it.	• 5 Year Planning Horizon, extended planning time frame • Target an increased recruitment (+10%) and retention (+20% longevity) of volunteers. • **Year 1 (2006):** Apply for S.A.F.E.R. grants. • **Year 1 (2006):** Develop incentives program and implement it.
5.4.c: Increased training and capabilities of firefighters.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **High** (30/30)	**Rural and Wildland Fire Departments, Districts, and Fire Service Areas** working with the **BLM and DNRC** for wildland training opportunities and with the **Fire Services Training School** for structural firefighting training.	• **Year 1 (2006):** Develop a multi-county training schedule that extends 2 or 3 years in advance (continuously). • Identify funding and resources needed to carry out training opportunities and sources to acquire. • **Year 2 (2007)**: Begin implementing training opportunities for volunteers.

Table 5.4. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon

5.4.d: Obtain a Type 6 wildland fire truck, a ProPAC foam kit, a floater pump, and additional personal protective equipment for the Broadview Fire District #3.	**Protection of people and structures** by direct firefighting capability enhancements.
	
	Project Ranking Priority Score: **Medium** (27/65)
		Broadview Fire District #3.	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus and grant) sources.
			• **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment based on prioritization by need and funding awards.
			  • **Estimated cost**
			  • **$80,000**

5.4.e: Support the construction of the new Fire Station/Clinic/Pharmacy/Community Center proposed in Lockwood.	**Protection of people and structures** by direct firefighting capability enhancements.
	
	Project Ranking Priority Score: **High** (30/30)
		Lockwood Fire District and community of Lockwood.	• **Year 1 (2006):** Verify stated need still exists, develop budget, locate funding and equipment (surplus) sources, and acquire required building plans and permits.
			• **Year 2 - 5 (2007-10):** Complete construction of new multiple-use facility.
			  • Estimated cost
			  • $5,200,000

5.4.f: Obtain a Type 6 engine, two 1,000 gallon pumper trucks, and a heated truck storage facility for the Worden Volunteer Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements.
	
	Project Ranking Priority Score: **Medium** (39/65)
		Worden Volunteer Fire Department, Worden Fire District #4, and the Huntley Project FSA.	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources.
			• **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment based on prioritization by need and funding awards.
			  • Estimated cost
			  • $430,000

5.4.g: Obtain a 4x4 pumper truck and a 1,500-2,000 gallon water tender for the Laurel Fire Department.	**Protection of people and structures** by direct firefighting capability enhancements.
	
	Project Ranking Priority Score: **Low** (22/65)
		Laurel Fire Department.	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources.
			• **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment based on prioritization by need and funding awards.
			  • Estimated cost
			  • $280,000

Table 5.4. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.h: Construction of a Shepherd Volunteer Fire Department satellite station in the Hidden Lake area.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **High** (41/65)	**Shepherd Volunteer Fire Department and Shepherd Fire Service Area**	• **Year 1 (2006):** Verify stated need still exists, develop budget, acquire land and equipment, and locate funding sources. • Estimated cost • $100,000
5.4.i: Additional heated equipment storage facility for the Broadview Fire Department #3.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **Medium** (26/65)	**Town of Broadview and Broadview Fire District #3.**	• **Year 1 (2006):** Verify stated need still exists, develop budget, acquire site, and locate funding sources. • Estimated cost • $80,000
5.4.j: Establish onsite water sources such as dry hydrants or underground storage tanks for rural housing developments.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **High** (46/65)	**County Commissioners, County Fire Warden,** Billings Urban FSA, Molt VFD, Homewood Park IAA, Duck Creek VFD, Shepherd VFD, Blains IAA, Blue Creek VFD, Lockwood VFD, Hailey Bench VFD, Crow Indian Reservation, Worden VFD, Custer VFD, Broadview FD #3, Worden FD #4, Laurel FD #5, Laurel FD #7, Lockwood FD #8, Blue Creek FSA, Laurel Urban FSA, Shepherd FSA, and Huntley Project FSA.	• **Year 2 -4 (2006-08):** Identify populated areas lacking sufficient water supplies and develop project plans to develop fill or helicopter dipping sites. • **Year 2 – 6 (2007-11):** Implement project plans.
5.4.k: Establish a site and install a higher capacity municipal well and pump and a 100,000 gallon storage tank for the town of Broadview.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **Medium** (28/65)	**Town of Broadview, Broadview Fire District #3, and the School of Mines.**	• **Year 1 – 3 (2006-08):** Identify populated areas lacking sufficient water supplies and develop project plans to develop fill or helicopter dipping sites. • **Year 2 – 6 (2007-11):** Implement project plans.

Table 5.4. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.l: Establish a non-potable water well and storage system to supply fire hydrants, dry hydrants, and fire suppression systems in public buildings in the town of Broadview.	**Protection of people and structures** by direct firefighting capability enhancements. Project Ranking Priority Score: **Medium** (28/65)	**Town of Broadview, Broadview Fire District #3, and the School of Mines.**	• **Year 2 – 4 (2006-08):** Conduct feasibility study and identify non-potable water source. • **Year 3 – 4 (2007-08):** Establish well and storage system and install water lines throughout the community to handle non-potable water. • On-going: Update public facilities with fire suppression systems using the non-potable water source.
5.4.m: Obtain a Type 3 WUI pumper truck for the Laurel Urban Fire Service Area.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **High** (40/65)	**Laurel Urban Fire Service Area.**	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources. • Estimate cost $150,000 • **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment to district based on prioritization by need and funding awards.
5.4.n: Obtain funding to add structural fire responsibilities to Broadview Fire District #3, which would include personnel incentives, additional rolling stock equipped with structural firefighting capabilities, structural turnout gear, and a larger equipment storage facility.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: Low (23/65)	**Town of Broadview and Broadview Fire District #3.**	• **Year 1 (2006):** Design plans for extension, identify grant funding opportunities, other funding as available. • **Year 2 (2007):** Begin and complete acquisition of funding and equipment, construction of a storage facility, and development of a mission statement and department policies. ○ Estimate cost $362,500
5.4.o: Obtain a Type 6 wildland engine and a wood chipper for Lockwood Fire District #8.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **Medium** (38/65)	**Community of Lockwood and Lockwood Fire District #8.**	• **Year 2 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources. • Estimate cost $72,000 • **Year 2 - 3 (2007-08):** Acquire and deliver needed equipment to district based on prioritization by need and funding awards.

Table 5.4. WUI Action Items in Firefighting Resources and Capabilities.

Action Item	Goals and Objectives	Responsible Organization	Action Items & Planning Horizon
5.4.p: Acquire sites and install dry hydrants on Pine Hills Road, High Trails Road, Coburn Hill Road, Yellowstone Trail Road, and Box Canyon Spring Road.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **High** (43/65)	**Community of Lockwood, Yellowstone County Fire Warden, and Lockwood Fire District #8.**	• **Year 2 -4 (2006-08):** Acquire land and develop project plans to develop dry hydrant sites. • **Year 2 – 10 (2007-17):** Implement project plans. o Estimate $17,000 per site.
5.4.q: Obtain one structural engine, 3 Type 3 engines (to replace old 6x6's), and one Type 2 water tender for the Shepherd Volunteer Fire Department.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **Medium** (37/65)	**Shepherd Volunteer Fire Department**	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding or equipment (surplus) sources. • Estimate cost $790,000 • **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment to district based on prioritization by need and funding awards.
5.4.r: Secure funding for a full time Laurel Volunteer Fire Department Chief.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **Medium** (39/65)	**Laurel Volunteer Fire Department and City of Laurel.**	• **Year 1 (2006):** Research and locate funding resources and work into yearly budget. Estimate cost $65,000 • Advertise position and select qualified candidate.
5.4.s: Equip Laurel Emergency Operations Center with radios and phone lines.	**Protection of people and structures** by direct fire fighting and emergency response capability enhancements. Project Ranking Priority Score: **High** (49/65)	**Laurel Volunteer Fire Department and City of Laurel.**	• **Year 1 (2006):** Verify stated need still exists, develop budget, and locate funding. • Estimate cost $75,000 • **Year 1 or 2 (2006-07):** Acquire and deliver needed equipment to department based on prioritization by need and funding awards.

5.7 Regional Land Management Recommendations

In section 5.3 of this plan, reference was given to the role that forestry, grazing and agriculture have in promoting wildfire mitigation services through active management. Yellowstone County is dominated by wide expanses of rangelands intermixed with communities and rural houses.

Wildfires will continue to ignite and burn fuels and homes depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels,

promotes healthy range and forestland conditions, and promotes the use of these natural resources (consumptive and non-consumptive) will insure that these lands have value to society and the local region. We encourage the Bureau of Land Management, the Montana Department of Natural Resources and Conservation, the Bureau of Indian Affairs, industrial land owners, private land owners, and all other landowners in the region to actively administer their Wildland-Urban Interface lands in a manner consistent with the management of reducing fuels and risks in this zone.

5.7.1 Federal and State Agency Projects

The guiding documents used to determine land use are the National Fire Plan (NFP), Healthy Forest Restoration Act (HFRA), and the goal statements of the individual agency to implement ecosystem restoration, protect communities from wildland fires, and to utilize prescribed fire as a tool in the restoration of the forest and to reduce the effects of wildfire leading to catastrophic loss. During the development of this project, acres managed by the USDA Forest Service, Bureau of Land Management, and the State of Montana that are in Fire Regime Condition Class II and III, as defined by the Forest Service and within the Wildland Urban Interface (WUI), were identified by the County as high priority areas to be treated under the NFP and HFRA. Federal or State managed lands adjacent to homes are particularly high priorities for these treatments. These projects may include, but are not limited to, mechanical treatments, prescribed fire, and creation of buffer zones and greenbelts.

5.7.1.1 Bureau of Land Management On-going Projects

5.7.1.1.1 Sundance Lodge Special Recreation Management Area

The Sundance Lodge Special Recreation Management Area (SRMA) is a small tract of land (379.9 acres) at the confluence of the Yellowstone and Clarks Fork of the Yellowstone River, south of the city of Laurel. This area includes habitat for whitetail deer, pheasants, waterfowl, and songbirds. (See Appendix I for map).

The Sundance Lodge is farm land intermixed with mature cottonwood and shrubs along the Clarks Fork River. It is characterized by Fuel models are 1, 2, 5 and 6. Fuel loads range from .74 to 6.0 ton/acre.

5.7.1.1.2 Four Dances Natural Area

The Four Dances Natural Area SRMA Area of Critical Concern (ACEC) (765 acres) is a tract of land with potential for heavy recreation use due to its location immediately east of downtown Billings. (See Appendix I for map).

The Four Dances area is native grasses including wheat and needle grasses, sagebrush, and pine along the rims above the Yellowstone River and cottonwood and brush along the river bottom. Fuel models are 1 and 5. Fuel loads range from .74 ton/acre to 3.0 ton/acre. Cultural values at the Four Dances Natural Area are, for the most part, not sensitive to damage from wildfire. The Native American religious values and similar values as a Traditional Cultural Properties are not at risk from wildfire. Suppression techniques should be modified to consider the fragile nature of the traditional and religious values.

5.7.1.1.3 South Hills Area

The South Hills area is directly south of Billings along the Yellowstone River. This tract of land lies between the river and a developed subdivision. (See Appendix I for map).

The South Hills area is native wheat grass and needle grasses, sagebrush, and a small amount of pine. This area fits fuel model 1. Fuel loads average .50 ton/acre.

5.7.1.1.4 Acton Area

The Acton area consists of six sections of public land north of Billings. Grazing and recreation are the primary uses of this area. (See Appendix I for map).

The Acton area is native wheat grass and needle grasses with mixed pine and big sagebrush, which fits fuel models 1 and 2. Fuel loads range from .74 tons/acre to 4.0 tons/acre.

5.7.1.1.5 Pompey's Pillar National Monument

Pompey's Pillar National Monument is located 30 miles east of Billings on the south side of the Yellowstone River. Within the Pompeys Pillar boundaries are the Pompeys Pillar National Landmark (approximately 8.23 acres) and a National Monument (approximately 51 acres). The combined acreage of the Landmark, the Monument, and the surrounding public lands, including the island in the Yellowstone River, is approximately 431 acres. The entire area is part of the Pompeys Pillar ACEC. This area includes a visitor center, associated outbuildings, and irrigated cropland. There is a 14 acre private inholding, owned by Robert Taylor, located within the eastern Pillar boundary along the south channel of the Yellowstone River. (See Appendix I for map).

Most of the land south and east of the pillar has been cultivated for the past 50-100 years. Some of this area near the pillar will be planted with native vegetation. The land north and east of the pillar has not been cultivated and is presently covered with dense cottonwood riparian woodland. The area is characterized by fuel loads that range from .74 to 6.0 ton/acre. Fuel models 1 and 5 fit the majority of this area with some fuel type 6.

South Pompey's Pillar represents an area of special consideration. The unit contains a National Landmark and National Monument. The entire unit is part of the Pompey's Pillar ACEC based on cultural values. Pictographs and petroglyphs, both historic and prehistoric, are the outstanding features of the monument, with the 1806 signature of William Clark as the centerpiece. Away from the pillar, visitor facilities, interpretive exhibits and historic structures and features require protection. Suppression objectives include:

- Protect native vegetative cover on all sites in and around the monument from catastrophic wildfire to prevent accelerated erosion and invasive species establishment on sites completely denuded of vegetative cover due to catastrophic wildfire.
- Protect riparian habitat, bald eagles and habitat, hairy woodpecker, spiny soft-shell turtles, Wood house's toad, hognose snake, and pale milk snake.
- Protect the presence of a national landmark, a national monument, an ACEC, and other archeological and historic resources.
- Protect structures that need fire protection including an interpretative center and farm structures.
- Protect the public with an estimated 130,000 visitors per year.

5.7.1.1.6 Shepherd Ah-Nei Recreation Area

The Shepherd Ah-Nei Recreation area is located north of the town of Shepherd. Heavy recreational use and urban interface combine to create safety concerns for firefighters and the general public on a 4,800 acre parcel of public land within this area.

The Shepherd Ah-Nei area is similar to the Acton area characterized by needle grasses with

mixed pine and big sagebrush which fits fuel models 1 and 2. Fuel loads range from .74 tons/acre to 4.0 tons/acre.

5.7.1.1.7 Other Projects

In general, almost all BLM lands within the Yellowstone County area contain a wide diversity of habitats and cultural sites. In general, identifiable site types are predominated by late prehistoric and protohistoric aboriginal sites and by historic period Euro-American homesteads. Typical prehistoric sites include tepee rings, brush and log habitation structures, open campsites, and resource procurement sites such as buffalo jumps.

5.7.2 Conservation Reserve Program

The fire hazard associated with the abundant Conservation Reserve Program (CRP) lands has become a prominent issue for all fire departments and emergency personnel in Yellowstone County. Due to the lack of management on CRP, a dense mat of highly flammable fuels build up as they sit in fallow year after year. Fires in these fuels burn at very high intensities with large flame lengths, particularly under the influence of the strong winds common in Yellowstone County. Once ignited, CRP fires can burn very rapidly, jumping roads and other barriers that would normally inhibit a natural range or grass fire. In the recent past, uncontrolled CRP fires have burned hundreds of acres and threatened countless homes and critical infrastructure such as main highways and power poles in Montana.

It is the recommendation of this plan that Yellowstone County enacts a policy defining an active management plan for fire hazard fuel reduction on Conservation Reserve Program lands. This plan should be based on a three year rotation where a certain number of acres are treated each year. Potential treatment options may include, but are not limited to, grazing, haying, prescribed fire, and/or tilling. Yellowstone County believes active management will reduce the fire risk associated with these fuels and cut down on the number of CRP fires responded to each year. This is especially critical on those acres adjacent to homes, businesses, and critical infrastructure.