Funny River Area
Community Wildfire Protection Plan
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Executive Summary

The Funny River Community Wildfire Protection Plan (CWPP) is a collaborative effort that is being developed in response to the 2003 Healthy Forests Restoration Act (HFRA). The HFRA directs communities exposed to wildfire to conduct a risk assessment and create a hazard fuel mitigation plan. Funny River has been designated as a “wildland-urban interface community within the vicinity of federal lands that are at high risk from wildfire” (Federal Register 2001). Through collaboration with federal, state and local agencies, the Funny River Community has been working to mitigate the risks and hazards of wildland fire.

The spruce bark beetle infestation has been a concern on the Kenai Peninsula for nearly two decades. This infestation, considered the largest in North America, has impacted more than one million acres of forested lands in the Kenai Peninsula Borough (KPB) as of 2004. The resulting spruce tree mortality has created an extreme wildfire hazard and has greatly increased the risk of a catastrophic loss to life and property across the region. In 1998, the U.S. Senate Appropriations Committee directed the USDA Forest Service to establish a multi-party task force to prepare an action plan to manage the impacts of the spruce beetle infestations in Alaska and to rehabilitate the infested areas. The KPB was designated as the lead agency for the Spruce Beetle Task Force. In 1998 the Task Force presented its findings, and the KPB formed the Spruce Bark Beetle Mitigation Program (SBB). The mission of the SBB is to help protect the lives and property of the residents of the KPB by identifying and mitigating wildfire and other hazards related to spruce bark beetle-killed spruce and to help restore healthy forests. In accordance with that mission statement, the SBB has facilitated the development of this CWPP.

The Healthy Forests Restoration Act (HFRA), enacted by the United States Congress in 2003, emphasizes the need for federal agencies to collaborate with communities to reduce the risk of destructive wildland fires. The HFRA recognizes that a successful CWPP is dependent upon involvement of local governments, local fire districts, state entities, and when applicable, other agencies that administer lands within and surrounding the community. Through this process, communities have the opportunity to influence where and how federal agencies implement fuel reduction projects on federal lands. There are three requirements for a complete CWPP as described in the HFRA:

Collaboration - A CWPP should be collaboratively developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local
government, local fire department, and state agency responsible for forest management, in consultation with interested parties and the federal land management agencies managing land in the vicinity.

**Prioritized Fuel Reduction** - A CWPP should identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment on federal and non-federal land that will protect an at-risk community or its essential infrastructure.

**Treatment of Structural Ignitability** - A CWPP should recommend measures to reduce the ignitability of structures throughout the at-risk community.

The HFRA emphasizes that priority for federal assistance will be given to communities that have identified treatment areas through development to a CWPP. The CWPP is developed to assist local fire districts, local government agencies, and residents with the identification of lands (including federal lands) that pose a severe wildfire threat and with identification of strategies for reducing hazard fuels on those lands while improving forest health, and improving firefighting response capabilities. In compliance with the HFRA, the CWPP compliments agreements among local government, local fire districts, and the state agency responsible for forest management. State, federal, and local agencies may then act and respond to the concerns and issues raised in the CWPP.

The Funny River CWPP identifies fuel hazards, values at risk from wildfire, and the fire history for the area. Mitigation actions are determined to deal with concerns and action items are prioritized for funding. Aside from any agency actions, site-specific planning and treatment is the responsibility of each landowner or jurisdictional agency and will be aided by this plan. Since this is an on-going plan, the Core Team of community members and agency advisors will work to carry out the action plan, pursue specified requests for assistance and revise the plan as action items are accomplished and new priorities emerge.
Introduction

Alaska’s 10.25-million acre Kenai Peninsula Borough has experienced a regional spruce bark-beetle outbreak that peaked in 1996 and continues to spread to uninfected areas. The outbreak resulted in extensive spruce mortality on approximately 1.3 million acres in the Borough by 2009. The infestation extends beyond the Borough and over the last two decades, an estimated 4 million acres of spruce in south-central Alaska have been affected. While spruce bark beetle outbreaks are natural events and periodically occur throughout south-central Alaska, the magnitude of spruce mortality during historic episodes was typically much less (20% to 30%) than the current infestation in which mortality rates exceeded 90%.

The 2003 enactment of the Healthy Forests Restoration Act (HFRA) gave an incentive to communities to engage in comprehensive forest planning and prioritization. This community-based forest planning and prioritization lead to the formation of the Kenai Forest, Wildfire Protection, and Fuels Management Coordination Committee. The committee’s goal was to increase collaboration and coordination on all strategic and project level planning to address the impacts of spruce bark beetle in the Kenai Peninsula Borough. The interagency committee includes representatives from:
• United States Forest Service (USFS); Alaska Region, Chugach National Forest, and State & Private Forestry;
• Alaska Division of Forestry (DOF);
• United States Fish & Wildlife Service (USFWS), Kenai National Wildlife Refuge (KNWR);
• USDI Bureau of Land Management (BLM), Anchorage Field Office;
• National Park Service, Kenai Fjords National Park;
• Kenai Peninsula Borough (KPB);
• USDI Bureau of Indian Affairs (BIA);
• Other agencies included on the interagency planning team include Alaska State Parks and Chugachmiut.

In November 2003, the committee met to develop an “All Lands/All Hands” five-year action plan (the Action Plan). In November 2009 the committee began work to develop a second five-year Action Plan. The purpose of the Action Plan is to identify and prioritize the full range of work needed to mitigate the impacts of the spruce bark beetle on the Kenai Peninsula. This mitigation work is organized according to the “National Fire Plan (NFP) 10-Year Comprehensive Strategy”. A major finding in the Action Plan is that wildfire potentially threatens approximately 51,000 KPB residents who live in 26,000 residential structures with a cumulative property value of $2.7 billion (all residential, industrial, and commercial infrastructures). Furthermore, 89% of the KPB valuation is located in 15 communities with either an extreme or high wildfire risk rating.

In accordance with the direction of the 2003 Healthy Forests Restoration Act (HFRA), the Action Plan places a priority on working collaboratively with communities in the Wildland-Urban Interface (WUI) and emphasizes the need for the communities on the Kenai Peninsula to complete Community Wildfire Protection Plans (CWPP). These CWPPs give local community members an opportunity to consider WUI boundaries around their community for themselves, identify and prioritize hazard fuel reduction projects, and to recommend measures to reduce the ignitability of structures throughout the at-risk community. Under the guidance of the Coordinating Committee SBB has taken the lead in facilitating these protection plans for each of the communities.
Community Wildfire Protection Plans

A Community Wildfire Protection Plan (CWPP) helps a community develop, clarify and refine its priorities for protection of life and property and critical infrastructure in the wildland urban interface. The CWPP brings together diverse local interests with a large base of knowledge to discuss their mutual concerns for public safety, community sustainability and natural resources. It offers a positive, solution-oriented environment in which to address challenges such as: local firefighting capability, the need for defensible space around homes and subdivisions, and where and how to prioritize land management on both federal and non-federal land. A CWPP can be used by Firewise program working groups, individual homeowners, fire departments, fire management personnel in natural resource agencies, and others involved in wildfire planning and mitigation efforts.

Wildland-Urban Interface

The Wildland-Urban Interface (WUI) is commonly described as the zone where structures and other features of human development meet and intermix with undeveloped wildland or vegetative fuels. Wildland fire within the WUI is one of the most dangerous and complicated situations firefighters face. Federal-level fire planning places a priority on working collaboratively with communities located within the WUI to reduce their risk from large-scale wildfire. Methods of reducing the risk of wildland fire include:

- Reducing the amount of fuels in the interface area;
- Fragmenting or breaking up continuous wildland fuels;
- Informing the public through education and outreach of Firewise program practices;
- Involving individual landowners in implementing Firewise techniques on their property;
- Improving fire suppression capabilities and fire response infrastructure;
- Reducing the incidence of human caused fires.

When a wildland fire occurs on the Kenai Peninsula, a primary goal for the Spruce Bark Beetle Mitigation Program is for homes and people to survive without having an associated residential disaster.
Community Profile

History

Funny River is located on the Kenai Peninsula, approximately 15 miles east of Soldotna and along the Kenai River, from River Mile 29 to 45. It lies at approximately 60.48 degrees North Latitude and 150.84 degrees West Longitude. (Township 4 North, Range 9 West, Seward Meridian.) Funny River is located in the Kenai Recording District. The area encompasses 27.2 sq. miles of land and 2.1 sq. miles of water.

Funny River is the local name of a nearby stream, first published in 1904 by the U.S. Geological Survey. Homesteading and farming expanded to the Funny River area during the late 1950s and early 1960s. Funny River Road originated as a bulldozed trail from Soldotna to the homesteads, and was upgraded to a gravel-surfaced road in the mid 1960s.

Culture and Demographics

There is no school in Funny River; 61 students are bused to Soldotna area schools. The community is primarily non-Native, however a large portion of the land in this area is owned by Alaska Native corporations.

The 2000 census placed the Funny River population at 636 residents with a median age of 45 years. There were 621 housing units in the area with 343 found vacant during the 2000 census, 307 were vacant due to seasonal use.

Economy and Transportation

Nearby Kenai and Soldotna offer a variety of employment opportunities. Sport fishing is the major attraction in this area of the Peninsula. The Kenai River offers top trophy king salmon fishing during June and July. Tourists from around the world visit the area to go fishing.

The Soldotna and Kenai airports serve local air traffic. The Sterling Highway provides access to Anchorage and other destinations. The Funny River Road is the only year round road that provides access to the Funny River Community. It is a narrow two-lane road maintained by the State of Alaska. The Central Peninsula Sports Center, located nearby in Soldotna, offers an ice rink, racquetball courts, weight room and meeting facilities. Residents of Funny River must drive to Soldotna to enjoy these amenities.

Climate

Minimum winter temperatures in January average 10 degrees Fahrenheit (F). The maximum summer temperature averages 63 degrees F in July. Average
annual precipitation is 25 inches, including an average of 66" of snowfall (water equivalent). There are 125 days with precipitation and 135 sunny days, annually.

**Planning Process**

Guidelines outlined in “Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities” (see References, Appendix C) were utilized to develop this plan. The steps outlined in the above handbook are the foundation for Funny River’s CWPP. The Handbook outlines eight steps to guide the development of a comprehensive Community Wildfire Protection Plan:

- **Step One:** Convene Decision Makers
- **Step Two:** Involve Federal Agencies
- **Step Three:** Engage Interested Parties
- **Step Four:** Establish a Community Base Map
- **Step Five:** Develop a Community Risk Assessment
- **Step Six:** Establish Community Hazard Reduction Priorities and Recommendations
- **Step Seven:** Develop an Action Plan and Assessment Strategy
- **Step Eight:** Finalize the Community Wildfire Protection Plan

**Step One: Convene Decision Makers**

Since the beginning of the SBB Program in 1999, SBB staff has worked in cooperation with other Borough departments and agency representatives from local, state and federal organizations. These agency representatives assisted in developing a plan of action for mitigating wildfire risks and community risk assessment parameters are derived from a combination of several computer software programs that calculate fire spread at different scales. FlamMap software was developed by Systems for Environmental Management in Missoula, Montana. It models fire behavior characteristics, including spread rate, flame length, and crown fire activity, by evaluating the fuel model, wind, and other conditions at the pixel level. FarSite software applies a combination of many pixels to the designated landscape area. It models the growth of a fire across the landscape using wind and weather data, fuel types, aspect, and slope to interpret fire behavior outputs. The resulting raster maps show the extent of a fire over a specified time period. This type of output can be used to determine the best use of available fire suppression resources such as fire engines, helicopters, air tankers, and fire crews.
In evaluating each component of the risk assessment, the SBB has selected areas where mitigation through forest treatment may limit the area’s exposure to wildfire. For example, a Borough-owned parcel that has high fuels hazard, high ignition risk, and is close to a subdivision would be prioritized for fuels reduction. Next, the Borough would work with the local community to write a suitable site prescription that addresses the forest fuels and forest health while carefully adjusting for stream and riparian zone protection and aesthetic values.

There are many unique factors about the neighborhoods and subdivisions throughout the central corridor of the Kenai Peninsula. Water supply systems are very limited. Most residents have septic systems and wells to meet daily needs. However, the increased demand for water for firefighting activities is rarely considered by the homeowner. There are few water storage tanks for firefighting. Central Emergency Services must dispatch large capacity water tenders to meet the needs of structure firefighters in lieu of pressurized hydrant systems. Response times are typically much longer than in a city or municipality due to the relatively small number of fire stations.

**The Core Team**

The Core Team involved in the development of this CWPP includes the Community of Funny River and agency representation from the Central Emergency Services Fire Department (CES), Funny River Volunteer Fire Department (FRVFD), Alaska Division of Parks and Outdoor Recreation (ADPOR), US Fish & Wildlife Service (USFWS), and the Alaska Division of Forestry (DOF).

**Core Team Members**

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<tr>
<th>Name</th>
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<tr>
<td>Johna Beech</td>
<td>Resident</td>
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<td>Diane Campbell</td>
<td>Resident</td>
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<td>Marilyn Cordner</td>
<td>Resident</td>
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<td>Diane Forgey</td>
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<td>Chris Mokracek</td>
<td>CES, Chief</td>
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<td>Josie Overman</td>
<td>Resident</td>
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<td>Jack Sinclair</td>
<td>ADPOR</td>
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<td>Jill Tyler</td>
<td>Resident</td>
</tr>
<tr>
<td>John Winters</td>
<td>Agency Rep, DOF &amp; Resident</td>
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<tr>
<td>Brian Yager</td>
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The Healthy Forest Recreation Act (HFRA) requires strong community involvement and commitment to ensure that local knowledge and perspectives are included in the plan. The core team members will conduct annual reviews to provide updates to the plan, document project accomplishments, schedule additional projects and ensure continued community involvement.

Step Two: Involve Federal Agencies

Managers and field staff from the Alaska Division of Forestry, US Forest Service, Bureau of Land Management & Alaska Fire Service, National Park Service, US Fish & Wildlife Service, have participated in the development and implementation of the KPB CWPPs. These agencies continue their involvement through mutual aid agreements for fire suppression, frequent consultation to coordinate staffing and resources during high fire danger, and direct communications. Through these existing partnerships, State and Federal agencies are also involved in developing long term plans to integrate into the CWPP.

Step Three: Engage Interested Parties

KPB and cooperating agencies have attended community council meetings, homeowner association meetings, local events and city and borough meetings. Local residents have expressed sincere interest in learning about wildfire risk and homeowner preparedness.

Step Four: Establish a Community Base Map

SBB has developed a comprehensive set of mapping layers that detail a number of physical attributes across all land ownerships. The mapping layers, available through the SBB website, support land ownership boundaries, satellite imagery, topography, and streets & addressing, among many other datasets. Additional layers used to evaluate fire danger include vegetation types, fuel models (Scott & Burgan), static fire behavior ignition potential, fire response time, value loss potential, and cumulative exposure to wildland fire based on these combined variables.

Step Five: Develop a Community Risk Assessment

The purpose of a community risk assessment is to locate wildland fire hazards within the area designated as the wildland-urban interface, to identify the values at risk, and to determine and prioritize hazard fuel reduction projects. Risk assessments also consider wildland fire occurrence, local preparedness, and wildland firefighting capabilities. The risk assessment process is ongoing and
future updates to the assessments will be attached as addendums to this plan. SBB utilizes 75ft-resolution imagery and other spatial data to rank exposure to wildfire. The exposure is based on the cumulative effect of four components (GRS 2007):

• **Hazard**, or the potential to burn, is based on the structure of forest fuels (horizontal-vertical arrangement) combined with slope and aspect to yield flame length and rate of spread. Hazard assessment uses nationally accepted fuel models to estimate expected fire behavior through sets of models developed at the Northern Forest Fire Laboratory in Missoula, Montana. Further refinement in the modeling has been accomplished by Anderson, Scott and Burgan.

• **Risk**, or the potential for a fire to ignite, stems primarily from human-caused fires: residential brush burning, recreational fires, fireworks, and homeless person camps. Roads and trails are considered access for humans to ignite fires.

• **Values**, or the potential for loss of life and property, include homes, public facilities, businesses, and utility infrastructure

• **Suppression**, or response capability, estimates how quickly water can be applied to the fire with consideration for the distance from a fire station, accessibility, and proximity to a water source. Central Emergency Services provides structure protection throughout most of the central corridor of the Kenai Peninsula, inclusive of the CWPP areas.

1. **Community Wildfire Protection Plan Boundary**

The wildland-urban interface can be described as the space where structures and other human-made development meet and intermix with the natural vegetation that often serves as fuel for a wildland fire. Wildland fire in the interface is one of the most costly and dangerous types of fires faced by fire managers today. Federal, state, and local governments place a high priority on working collaboratively to address the wildland fire threat to communities within the WUI. Some proven methods of reducing the risk of wildland-urban interface fires include

• reducing the volume of wildland fuels in the interface area;
• breaking up the vertical and horizontal continuity of vegetation;
• instructing and educating the public on Firewise concepts;
• involving individual landowners in implementing Firewise concepts on their
properties;
• developing improved wildland fire suppression capabilities and infrastructure at all levels; and
• decreasing the incidence of human-caused wildland fires through multiagency prevention efforts.

The Healthy Forests Restoration Act (HFRA) describes the WUI as those areas within or adjacent to an at-risk community and defaults to ½ to 1 ½ miles from the community boundaries. Inside of this political boundary, additional specific risk assessments and action plans are being developed for community council areas that have a high potential for a WUI fire, as determined by the SBB risk assessment and field reconnaissance. Other large land bases that would impact the spread and intensity of wildland fire include Kenai River State Park areas and the U.S. Fish & Wildlife Refuge lands. There are also tracts of KPB and State Lands managed under various management objectives as well as lands held within private ownership.

2. Wildland Fire Hazards in the Wildland-Urban Interface

Alaska’s Key Wildland Fire Fuels

• Fire-prone areas on the Kenai Peninsula are generally in flat and rolling terrain below 2,000 feet in elevation.
• Subdivisions are spread out in the boreal forest of population centers.
• North-facing slopes are generally poorly drained, underlain by permafrost, and host black spruce.
• South-facing slopes are fairly well drained and typically host deciduous species.
• Rivers meander often have stringers of white and black spruce and mixed deciduous trees.

The northern boreal forest of Alaska is primarily open, slow-growing spruce interspersed with occasional dense, well developed forest stands and treeless bogs. This type of regional vegetation is referred to by the Russian term, “taiga” to differentiate it from the closed, fast growing forests of the more southerly region of the boreal forest. The Kenai Peninsula is in the transition between these two distinctly different types. In Alaska, the taiga is approximately 32% forested but only about 7% of the taiga is classified as “commercial” forest land.

On the warmest, well-drained sites, the forests consist of closed spruce-hardwood stands, including white spruce (Picea glauca, including varieties),
paper birch (*Betula papyrifera*) and aspen (*Populus tremuloides*). On poorly drained sites, including those underlain by permafrost and on north-facing slopes, the dominant forest species is black spruce (*Picea mariana*). On the wettest sites, associated with black spruce may be tamarack (*Larix laricina*). Black cottonwood (*Populus balsamifera ssp. trichocarpa*) and Balsam poplar (*P. balsamifera*) can be found in extensive stands on the floodplains of major rivers, such as the Kenai River and its tributaries.

On the broad expanses of the foothills and upland areas are extensive areas of open stands of white spruce and black spruce with willows, resin birch, ericaceous shrubs, Cladonia lichens, feather mosses and sphagnum mosses. Throughout the taiga, there are bogs of many types that support rich grasses and sedges and a tussock sedge type with sphagnum mosses and low ericaceous shrubs. The areas with widely scattered black spruce may be generally referred to as “muskeg”.

Grasslands in some areas, particularly where there have been disturbances, such as timber harvest, fire, or other natural or human caused events made up of primarily blue-joint reed grass (*Calamagrostis canadensis*) and Festuca altaica are prevalent, particularly where stands of white spruce were attacked by spruce bark beetles over the past two decades.

Native blue-joint reed grass (*Calamagrostis canadensis*) is the primary carrier of wildland fire in south-central Alaska. This fuel type is most dangerous in spring, before green-up. The dry cured mat of grass resembles straw. Wind can quickly spread a small grass fire across tens of acres before firefighters arrive. Flame lengths in grass frequently exceed four feet in length, exceeding the capability of firefighters on the ground. The danger of this fuel type cannot be overestimated. It is the fuel that has caused hundreds of homes to burn throughout Alaska, including structures in the 2007 Caribou Hills Fire.

This grass type occurs in forest openings common in the wake of the spruce bark beetle epidemic, fire, and timber harvesting. The hazard of this fuel type is easily mitigated around structures by annual mowing. In managed areas, this species of grass may be replaced by other native grasses, although the success of this technique is still being monitored.

Black spruce stands, common on lowland and upland sites throughout the state, present a particularly dangerous fuel type. Sites are typically poorly drained and are almost always underlain by permafrost. Feather mosses dominate the forest
floor in these stands; these fine fuels react quickly to dry conditions and significantly increase fire behavior. Tree branches extending to or near the ground and dead branches draped with bearded lichen contribute to the extreme flammability of this fuel type and lead to crown fires.

White spruce typically displays less intense fire behavior than black spruce. Although more commonly found on upland sites, white spruce may occur in stringers and stands along river bottoms and valleys. Independent crown fire and torching rarely occurs in white and Lutz spruce.

Deciduous tree species include birch, aspen, and poplars. Typically these forest fuel types do not burn with high intensity but are difficult to extinguish because of deep leaf litter and longer intervals between fires. Deciduous forest species are often in mixed stands with black and white spruce. Deciduous stands exhibit less intensity and may be used as a fire break in certain conditions. However, this fuel type burns readily in late summer if dry conditions persist.

Beetle-killed spruce timber represents a dynamic fuel type. Soon after the tree dies, the red needle phase can support dangerous crown fires. Dry branches and crowns may ignite from surface fire in needles, grasses or organic layers. Five to 10 years after an infestation, the beetle-killed spruce trees fall down as the base of the tree rots from red belt fungus and/or carpenter ants and they become susceptible to wind-throw. As the forest canopy opens, blue-joint reed grass (*Calamagrostis canadensis*) invades the site.

Combined with forest debris accumulating from decadent trees breaking down over time, the cumulative fuel complex is dangerous. The severe fires that burn in these heavy fuels result in ecological damage. Also, snags act as a receptor for aerial firebrands and an overhead safety hazard to firefighters. Firefighters cannot safely fight fire on the ground because they can’t move through the forest and retreat to safety zones. This increases the dependence on aerial fire suppression resources such as helicopters and air tankers, often in short supply during the wildland fire.

3. Values at Risk - Loss Potential

Defining characteristics of the Kenai Peninsula include its centrality of commerce, open green spaces, wildlife, world class fisheries and dramatic mountain views. Fire in the boreal forest that is common on the Kenai Peninsula is a natural force that creates and changes this ecosystem. Choosing to live in this environment
places a responsibility on each resident, because fire can and will happen. Choosing to be prepared allows residents to survive a fire event and sustain this lifestyle. Protecting these values must incorporate Firewise principles for homes, forest management, diligent fire response training, and a well-maintained fleet of firefighting apparatus.

Throughout the Kenai Peninsula, hundreds of homes are nestled in the boreal forest. The potential for fire to spread through these neighborhoods combined with the limitations of the road system and topographic/hydrologic features, such as the Kenai River, creates a challenge for fire suppression. In many of these areas, fire engines are challenged by narrow gravel roads, dead ends, and steep grades. Response times and maneuverability may be considerably limited. With the potential for panic during a serious wildland fire, the risk for a vehicular accident and personal injury increases dramatically for both civilians and emergency personnel.

The SBB risk assessment evaluates only human-made improvements: public infrastructure, homes, schools and other facilities. This objective methodology allows fire management staff to plan forest treatment projects on public lands and conduct outreach to specific neighborhoods with high risk of structural loss.

4. Risk of Wildland Fire Occurrence

Alaska is a vast state, encompassing 375 million acres with approximately 220 million acres vulnerable to wildland fire. During the Alaska interagency fire management planning process in the early 1980s, Alaska was divided into four generalized geographic areas in an effort to describe fire regimes. These fire regimes are Southeast, South-central, Interior, and the Arctic—West Coast. Over the past 10 years, fires have burned millions of acres across these regions, with the least impact occurring in the Arctic.

The KPB falls entirely within the south-central fire regime, which is in the transition zone between marine and continental climate influences. The majority of fire starts in this regime are human-caused, but lightning is also a factor. Vegetation is a mix of tussock-tundra, conifers, and deciduous forests. The area receives an average of 20 inches of precipitation and averages 65 fires per year. Burning intensity is moderate to extreme, and resistance to control is moderate to high. This regime has a serious wildland-urban interface problem. The 1996 Miller’s Reach Fire, located in the adjacent Mat-Su area, burned 37,700 acres and destroyed 454 structures. This fire demonstrated that even with road access,
densely populated regions of the state can suffer disastrous consequences from wildland fire.

Boreal forests throughout south-central Alaska experience wildland fire at varying intervals and intensities, depending on annual weather patterns, fire ignitions, and moisture content of the vegetation. Springtime before green-up and late summer often deliver dry weather and warm winds.

5. Fire History

The wildland fire history data for the Kenai Peninsula was tabulated for the period 2003 through 2008, yielding 261 reported fires that burned 109,620 acres. There is a more comprehensive statistical analysis in Appendix A that covers 27 years of data, however the more recent years depict the most current challenges. The majority of these wildland fires were caused by either cooking/warming fires or debris burning. Intentional fires or those started with incendiaries accounted for 5 fires burning 264 acres. A portion of these fires are likely started by juveniles experimenting with fire but without any intention to cause harm. Cigarette smoking caused only 2 fires over the past six years. Lightning or other acts of nature caused 27 fires, burning 38,442 acres.

6. Fire Season / Weather Patterns

In the last 10 years, the State of Alaska has averaged 478 fires each year (statwide, including the Kenai Peninsula); 30% ignite from lightning strikes and 70% are human-caused (Alaska Department of Natural Resources). Fire season usually starts in Alaska on the southern tip of the Kenai Peninsula (including Kodiak Island) by late March or early April. These early season fires are typically escaped debris or land clearing burns or occasionally, an abandoned campfire. Fire season progresses with the number of new fires increasing into late spring as the days get progressively longer. The majority of these human caused fires occur on the Kenai Peninsula during late April and May, due mostly to the very dry, pre-green up conditions, periods of very low relative humidity and occasional wind events.

Lightning season starts in mid-May and generally peaks by mid-July. Some years there may be only a few lightning fires in the area while other years residents may experience numerous lightning-caused fire starts. The lightning-caused fires occur mostly within the refuge, with some notable exceptions. The majority of the human-caused ignitions, in contrast, occur along the road system throughout
south-central Alaska.

Fire season may subside during some years immediately after green up. The balance of fire season activity depends upon the amount of warm sunny weather and dryness of the vegetation. There may be an increase in fires during the late summer months, especially during hunting season. Most of these late season fires are fairly small and innocuous.

7. Fire Causes

Wildland fires on the Kenai Peninsula central corridor, including the Funny River area, are usually human-caused (refer to Appendix A). **Human-caused wildland fires account for 97% of fire ignitions on the Kenai Peninsula over a recent 27 year period.** However, lightning strikes have increased in frequency in recent years, with numerous strikes recorded in 2005, resulting in 22 detected fires. In the SBB assessment the risk of human-caused fire ignition is based on the proximity of an area relative to human concentration. Roads and trails are weighted higher than areas with no access to reflect the potential for a human to ignite a fire. As shown in the risk map, ignition potential is shown as high near transportation corridors.

Wildland-urban interface fires challenge suppression agencies in Alaska just as they do in other parts of the country. The most acute increase in population and subsequent increased housing density at the interface, on the road system, is occurring on the Kenai Peninsula, in the Matanuska-Susitna Borough, and near Anchorage and Fairbanks. These areas all have the classic wildland-urban interface problems associated with rapid population growth without adequate zoning or fire planning.

The interagency fire community in Alaska adopted the Canadian Forest Fire Danger Rating System (CFFDRS) for predicting fire danger. This interagency decision was made in the early 1990s based on the fact that the CFFDRS was developed in fuels similar to those in Alaska and at similar latitudes. The Canadian Forest Service has provided technical support to Alaska fire research projects and suppression policies.

**Key Wildland Fire Weather Factors (Stam 1999)**

- There is no “typical" weather pattern for any part of Alaska. Weather prediction in Alaska is difficult.
• Strong high-pressure systems can dominate for days with clear skies, warm temperatures, and low humidity.
• Daily thunderstorm activity and atmospheric conditions during these periods can contribute to high-intensity, plume-dominated, blow-up fires.
• High-pressure systems can break down rapidly. Cool, moist arctic air can move in, followed abruptly by a return of high pressure and good burning conditions.
• Summer temperatures range from 50 to 85°F, with occasional readings in the 90s.
• Winds are variable, depending on local terrain. Winds can sometimes exceed 80 mph.
• Mountain ranges, glaciers, and permanent snowfields can cool air masses, causing down-slope flows.
• The 24 hours of daylight (civil twilight) in June and July decreases the normal daily differences in temperature and relative humidity. This limits “recovery” of humidity that is common in the Lower 48, where fire activity decreases dramatically during the evening hours.

Critical weather factors are:

1. Heavier fuels will burn at 50% relative humidity.
2. Relative humidity below 30% and temperatures in excess of 80°F indicate extreme fire behavior in black spruce.
3. Winds velocities of 20 mph and higher contribute to extreme fire behavior.

8. Natural or Manmade Barriers

There are numerous barriers to the spread of wildland fires, both manmade and natural. Manmade barriers, such as the Sterling Highway and numerous local roads throughout the area, offer significant breaks in the continuity of the fuels. Natural barriers, such as rivers and lakes, offer similar breaks to the large expanse of flammable vegetation. There are several very large lakes, including Tustumena and Skilak Lakes, which not only offer barriers to the spread of fire, but also influence the weather in some dramatic ways. Keep in mind that long range spotting may carry embers over what seem like formidable and impenetrable barriers to the spread of wildland fire.

9. Alaska Interagency Fire Management Plan

Virtually all forested lands in Alaska are protected in accordance with the Alaska
Interagency Fire Management Plan, which was developed in the 1980s to provide a coordinated and cost-effective approach to fire management on all lands, regardless of ownership. The plan is an interagency document and has been signed by all major landowners in Alaska. It classifies forested lands into four fire management categories: critical, full, modified, and limited. The fire management levels are evaluated based on the protection of human life, private property, and pre-identified high-value resources. All of the lands on the Kenai Peninsula except for the uninhabited areas in the U.S. Fish & Wildlife Service Refuge are classified as critical, full, or modified protection areas and receive aggressive initial attack.

Step Six: Establish Community Priorities and Recommendations

1. Reducing Structural Ignitability:

A basic concept of this CWPP is that the homeowner is ultimately responsible for ensuring that everything that can be accomplished to make their property Firewise has been done. Part of this responsibility is to understand the ignition potential of their home and other structures. In a wildland fire, structures are in essence, a fuel source that will burn if fire is allowed to encroach upon them. Wildland fire spreads through a receptive fuel bed through four main processes:

1. **Conduction** is the process of the flame coming into direct contact with the structure or other fuels;
2. **Convection** preheats fuels as the heat and flame from the main fire rises and ignites fuels ahead of the flaming front;
3. **Radiation** is the process where the fire heats the adjacent fuels to a point where they will ignite without direct contact with the flames;
4. **Fire Brands** are burning embers or other burning materials (such as cedar shake shingles) that are carried aloft by the wind and deposited in advance of the fire.

Recent studies have shown that structural ignitability is the principle cause of structure loss in a wildland fire and that reducing the ignitability of structures is critical to their survival. Homeowners can make a huge difference in increasing the survivability of their homes and structures by ensuring that their property meets the following Firewise principles:

- Use non-combustible construction materials to the greatest extent possible, especially non-combustible roofing materials.
- Screen or enclose openings into structures and under porches and decks.
• Develop a defensible space around the structure that is at least 50 feet wide.
• Utilize fire resistant plant materials for landscaping.
• Remove flammable materials from on and around the structure. If the structure is built on a slope, the defensible space must be greater on the down slope side of the structure corresponding to the steepness of the slope.
• Thin coniferous trees and remove lower limbs on trees within 100 feet of structures.
• Establish fuel breaks such as roads, pathways, lawns and gardens to break up the continuity of flammable fuels within 100 feet of the structure.
• Establish a non-flammable barrier (rock garden or flower beds) around the foundation of the structure.
• Improve driveway access to facilitate personal and emergency vehicle traffic.

A structure will not burn in a wildland fire unless it is involved in the fire through one of the four processes discussed previously: conduction, convection, radiation of the fire or through flaming firebrands. It is imperative that homeowners take the responsibility of ensuring that their property is Firewise. Additional reference materials for Firewise education can be found at www.firewise.org, or www.firewisekp.com or on the KPB website at www.borough.kenai.ak.us/sbb.

2. Hazard Fuels Reduction Projects:

Hazard fuels reduction treatments will vary, depending on each specific targeted area. The vegetation, fuel loading, topography and other factors will determine the treatment standards. The extent of treatment required can vary from small areas of less than an acre, to larger areas comprising several hundred acres (or more) of highly flammable vegetation. Black spruce is a good example of a problem vegetation type that needs treatment in the wildland urban interface. An effective fuels treatment program must involve all of the landowners/managers in an area. Completing a hazard fuels reduction treatment on a portion of the area that needs to be treated is simply a waste of money.

The map in the appendix section entitled “Black spruce vegetation type” identifies some of the areas that need attention and further refinement for fuel reduction projects. Prior to the implementation of any of these projects, a site-specific map for each area should be created. Areas should be listed for treatment in order of priority and land managers as well as adjacent private landowners need to meet and discuss the desired results, impacts and cost of each project. Grant funding should help to offset much of the cost.
Fuel breaks can be an effective tool in a strategic fire planning process in light fuels, such as in the grass fuel type, including areas of beetle kill where grass has invaded the deteriorating stands of timber. Mowing and prescribed fire are two methods that can be implemented to create fuel breaks or maintain them, which must be considered prior to making the choice to include them as a strategy. Many communities have built expensive fuel breaks and failed to maintain them over time. Fuel breaks that are at least two times as wide as the expected flame lengths or wider should be placed along roads surrounding the WUI or at-risk areas.

The topography is primarily flat throughout much of the forested areas of the KPB, meaning the placement and width of the fuel breaks should remain relatively consistent across the CWPP area. Table 7.1.c. identifies the recommendations for fuels reduction projects when funding becomes available. In addition to the risks and prioritized recommendations outlined in the table, other considerations including appropriateness of the treatment, landownership constraints, locations of ongoing projects, available resources, and other physical or ecological barriers to treatment, that need to be considered when implementing any recommendations.

3. Improved Fire Response & Public Safety:

Volunteer fire departments (VFDs) are the primary source of assistance for fire protection and response in the KPB, specifically Central Emergency Services. Community involvement, along with financial support, is imperative to maintain effective operations in the fire departments. Securing adequate water supplies, both stationary (hydrants & tanks) and mobile (tenders), continued training, and equipment maintenance are among some of the foremost concerns for improving fire response capabilities. The primary recommendations from the core team and CES officials focused on adding a Type 6 wildland engine to both the Funny River CES station and the Sterling CES station to help improve wildland fire response capabilities within the central corridor (and specifically the Funny River Area).

Step Seven: Develop an Action Plan and Assessment Strategy

Before finalizing the Community Wildfire Protection Plan (CWPP), core team members and key community partners should consider developing an action plan that identifies roles and responsibilities, funding needs, and timetables for carrying out the highest priority projects. Additional consideration should be given
to establishing an assessment strategy for the CWPP to ensure that the
document maintains its relevance and effectiveness over the long term.

No plan is complete until it is implemented, including CWPPs. The
recommendations contained in this CWPP should be reviewed within three
months of formal adoption of the plan. Maintenance of the CWPP should include
an annual schedule for monitoring and evaluating the programmatic outcomes
established in the Plan. A thorough review and rewrite (if necessary) should also
take place every five years. Regular evaluations of the CWPP should 1) assess
the effectiveness of programs, and 2) identify any changes in hazard-risk
assessments.

Coordinating agencies responsible for various implementation processes should
report on the status of their projects, the success of various implementation
processes, difficulties encountered, success of coordination efforts, and which
strategies should be revised or removed. Organizations participating in the Plan
evaluation should be clearly identified in the evaluation. Fire protection and
prevention in the interface is an ongoing process.

Meetings were held with the residents of the Funny River CWPP and agency
advisors to elicit their concerns and priorities for assessments and action plans.
The areas of concern outlined in the action plan reflect the community’s concerns
as well as the concerns of the agency advisors who helped in the development of
the plan. There are certainly others, who have not participated in the
development of this CWPP, including various groups, organizations and other
residents, who should be given an opportunity to add their ideas during the first
update of the CWPP, next year.
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<th>Action Item Category</th>
<th>Recommended Actions</th>
<th>Priority</th>
<th>Responsibility</th>
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<tr>
<td>Reduce the structure ignition potential for Funny River homes.</td>
<td>Provide home ignition zone training to residents on a recurring basis</td>
<td>High</td>
<td>Core Team, KPB, state, federal agencies</td>
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<tr>
<td>Home assessments for area residents</td>
<td>Continue Firewise home assessment project</td>
<td>High</td>
<td>KPB, state, federal agencies</td>
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<tr>
<td>CERT Fire Corp Training</td>
<td>Provide Fire Corp training to residents on a recurring basis</td>
<td>High</td>
<td>KPB</td>
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<td>Media outreach to educate the public</td>
<td>Develop a CWPP media action plan</td>
<td>Medium</td>
<td>Core Team, KPB, State DOF</td>
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<td>Firewise booth at the Funny River Festival</td>
<td>Provide a booth at the festival</td>
<td>Medium</td>
<td>Core Team, KPB</td>
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<tr>
<td>Fire information and notification</td>
<td>Develop a “Rapid Notify In-Place” system for the area</td>
<td>High</td>
<td>Core Team, KPB</td>
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</table>
### Table 7.1b Funny River CWPP Action Plan

**Area of Concern Topic: Hazard Fuels Reduction Projects**

<table>
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<th>Action Item Category</th>
<th>Recommended Action</th>
<th>Priority</th>
<th>Responsibility</th>
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<td>Funny River State Park hazard fuels</td>
<td>Develop projects and seek funding for fuels removal</td>
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<td>State Parks, KPB</td>
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<tr>
<td>Improved access to public lands so residents can harvest firewood from beetle killed trees</td>
<td>Develop public access program on borough, state, and federal lands</td>
<td>High</td>
<td>KPB, state, and federal agencies.</td>
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<td>Funny River Road fuels reduction projects to improve access during fire situations</td>
<td>Identify high hazard areas, develop projects, seek funding</td>
<td>High</td>
<td>Core Team, KPB, state, federal agencies.</td>
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<td>Identify slash disposal sites</td>
<td>Locate and fund a location(s) for residents to dispose of slash</td>
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<td>KPB</td>
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<tr>
<td>East end of Funny River Road fuels hazards w/ emphasis on large stands of black spruce &amp; beetle kill</td>
<td>Agencies accomplish a hazards fuels assessment</td>
<td>Medium</td>
<td>KPB and state fire agencies</td>
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<tr>
<td>Widen utility ROWs for use as fire breaks</td>
<td>Identify areas for projects and seek funding</td>
<td>Medium</td>
<td>KPB and state fire agencies, utility companies.</td>
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<tr>
<td>Assist Senior Citizens in providing for defensible space</td>
<td>Identify persons who need assistance &amp; complete work</td>
<td>High</td>
<td>Core Team, KPB</td>
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</table>
Table 7.1c Funny River CWPP Action Plan

Area of Concern Topic: Response & Public Safety

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<td>Locate and identify escape routes and safety zones.</td>
<td>Fire agencies locate, sign routes and zones and educate the residents</td>
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<td>Inadequate bridge at MP 10.5</td>
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<td>Community-wide resource list</td>
<td>Develop list</td>
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<td>Map all water access sites</td>
<td>Develop a list and a map</td>
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<td>Boat Escape Planning</td>
<td>Develop an escape plan by boat for situations precluding escape by road</td>
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<td>Core Team, KPB</td>
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**Step Eight: Finalize the Community Wildfire Protection Plan**

The draft plan was presented to the residents of Funny River and routed through the appropriate agency leadership positions to obtain consensus on strategies and actions identified. CWPP implementation and updating will be an on-going process.
IV. Signature Page

The following community representatives/agencies have reviewed this Community Wildfire Protection Plan and support the efforts of this community to reduce wildfire threats, increase wildfire preparedness and further wildfire education.

Chris Mokracek, Chief
Central Emergency Services
Fire Department

Scott Walden, Director
Office of Emergency Management
Kenai Peninsula Borough

Hans Rinke, Area Forester
Division of Forestry
Alaska Department of Natural Resources
## Appendix A

### Kenai Kodiak Area Fire Cause 1982-2008

#### Kenai-Kodiak Area Fire Cause 1982 - 2008, 27 Years

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<td><strong>96</strong></td>
<td><strong>70</strong></td>
<td><strong>50</strong></td>
<td><strong>101</strong></td>
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<td><strong>33</strong></td>
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<td><strong>51</strong></td>
<td><strong>72</strong></td>
<td><strong>48</strong></td>
<td><strong>44</strong></td>
<td><strong>56</strong></td>
<td><strong>52</strong></td>
<td><strong>30</strong></td>
<td><strong>30</strong></td>
<td><strong>31</strong></td>
<td><strong>1588</strong></td>
</tr>
</tbody>
</table>

| Aver Fires per Year: | 58.8 |

*TOTAL ESCAPED CONTROLLED BURNS = 506 32% As of 10/01/08

## Major Fires in the Kenai-Kodiak Area by year

| Name          | Fire Number | Cause               | Start Date | Start Time | Acreage | FWI | Stat | RH | Wind Speed | Wind Direct | Temp | Stat | RH | Wind Speed | Wind Direct | Temp |
|---------------|-------------|---------------------|------------|------------|---------|-----|------|----|------------|-------------|------|------|----|------------|-------------|------|     |
| Skilak Lake   | 000000      | Campfire            | 1947       |            | 308,750 | ac.  |      |    |            |              |      |      |    |            |              |      |     |
| Echo Lake     | 000000      | 1969                |            |            |         |      |      |    |            |              |      |      |    |            |              |      |     |
| Island Lake   | 000000      | 1970                |            |            | 3500    | acres|      |    |            |              |      |      |    |            |              |      |     |
| Susitna River Rd | 6-9311    | Campfire            | 1969, 8-3  | 1400       | 73,865  | acres|      |    |            |              |      |      |    |            |              |      |     |
| Mill Lake     | 7-7650      | Chimney Sparks      | 6/11/1979  | 16:08      | 70      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Furry Fire    | 8-7656      | Kids/Fireworks      | 6/18/1981  | 15:08      | 320     | acres|      |    |            |              |      |      |    |            |              |      |     |
| Swanson River Rd | 3303032 | Campfire            | 6/4/1983   | 16:08      | 65      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Candletlight  | 8403852     | Motorcycle Exhaust  | 6/2/1984   | 17:10      | 80      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Moose Pass    | 9603851     | Powerline           | 6/6/1986   | 120        | acres   |      |      |    |            |              |      |      |    |            |              |      |     |
| Oil Well Road | 8903514     | Grass Burning       | 5/10/1991  | 17:48      | 7,000   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Puthole       | 9103108     | Campfire            | 5/19/1991  | 17:48      | 7,000   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Skyline Fire  | 9303192     | Kids                | 5/9/1996   | 12:45      | 30      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Windy Point   | 9403655     | Campfire            | 8/30/1994  | 20:40      | 2,700   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Vosnesenka    | 9603133     | Kids                | 5/9/1996   | 12:45      | 30      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Kazakof Bay   | 9603158     | Cigarettes          | 5/11/1996  | 13:44      | 1,200   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Hidden Creek  | 9603159     | Cigarettes          | 5/11/1996  | 13:44      | 1,200   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Crooked Creek | 9603411     | Logging             | 6/6/1996   | 22:43      | 17,300  | acres|      |    |            |              |      |      |    |            |              |      |     |
| Summer Creek  | 96037001    | Logging             | 5/3/1996   | 17:10      | 85      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Greenfield Rd.| 9703184     | Brush Burning       | 5/26/1997  | 14:35      | 9       | acres|      |    |            |              |      |      |    |            |              |      |     |
| C-Breach MP 1 | 9703555     | Unknown             | 7/8/1997   | 17:41      | 90      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Maitland Rd.  | 9903171     | Brush Burning       | 6/4/1999   | 17:37      | 75      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Chip Cove     | 2030302     | Campfire            | 4/6/2002   | 13:30      | 350     | acres|      |    |            |              |      |      |    |            |              |      |     |
| Kuyauk Bay    | 203021      | Campfire            | 5/2/2002   | 8:45       | 786     | acres|      |    |            |              |      |      |    |            |              |      |     |
| Augusta Lane  | 203084      | Brush Burning       | 5/18/2002  | 11:10      | 8       | acres|      |    |            |              |      |      |    |            |              |      |     |
| Cottenfield Rd.| 303015    | Brush Burning       | 3/12/2003  | 13:43      | 127     | acres|      |    |            |              |      |      |    |            |              |      |     |
| Cottenfield e Fire | 303160 | Brush Burning       | 5/15/2003  | 18:55      | 26.5    | acres|      |    |            |              |      |      |    |            |              |      |     |
| Glacier Creek | 483599      | Campfire            | 8/14/2004  | 16:47      | 7,125   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Tracy Avenue  | 503026      | Powerline           | 4/29/2005  | 14:43      | 5,400   | acres|      |    |            |              |      |      |    |            |              |      |     |
| Kole & County Creek | 503344 | Lightning            | 6/26/2005  | 20:23      | 10,131  | acres|      |    |            |              |      |      |    |            |              |      |     |
| Fox Creek     | 503450      | Lightning           | 7/11/2005  | 17:15      | 31,000  | acres|      |    |            |              |      |      |    |            |              |      |     |
| Cohoe Loop    | 603069      | Brush Burning       | 5/22/2006  | 14:11      | 67      | acres|      |    |            |              |      |      |    |            |              |      |     |
| Carbon Hills  | 703278      | Equipment Ignit      | 6/19/2007  | 17:34      | 55,648  | acres|      |    |            |              |      |      |    |            |              |      |     |
Appendix C: References


Community Wildfire Protection Plan
Glossary of Terms

*Authority Having Jurisdiction (AHJ)* – The organization, office, or individual responsible for approving equipment, materials, an installation, or a procedure (NFPA, *NFPA 1144*, 2002, p. 4).


*Building* – Any structure used or intended for supporting or sheltering any use or occupancy (NFPA, *NFPA 1144*, 2002, p. 4).

*Combustible* – Any material that, in the form in which it is used and under the conditions anticipated, will ignite and burn or will add appreciable heat to an ambient fire (NFPA, *NFPA 1144*, 2002, p. 5).

*Community Wildfire Protection Plan (CWPP)* – Address issues such as wildfire response, hazard mitigation, community preparedness, or structure protection. The process of developing a CWPP can help communities clarify and refine their priorities for the protection of life, property, and critical infrastructure in the wildland-urban interface (Source: *Preparing a Community Wildfire Protection Plan*. March, 2004).

*Condition Class* – Describes fire-related risk to ecosystems and relates current expected wildfires to their historic frequency and effects. Condition class ranks are defined as the relative risk of losing key components that define an ecosystem. Higher ranked areas present greater risk to ecosystem health. Condition class is a measure of the expected response of ecosystems to fire given current vegetation type and structure that often is far different from that historically present.

<table>
<thead>
<tr>
<th>Class</th>
<th>Departure from natural regimes</th>
<th>Vegetation composition, structure, fuels</th>
<th>Fire behavior, severity, pattern</th>
<th>Disturbance agents, native species, hydrologic functions</th>
<th>Increased smoke production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Condition Class 1</td>
<td>None, minimal</td>
<td>Similar</td>
<td>Similar</td>
<td>Within natural range of variation</td>
<td>Low</td>
</tr>
<tr>
<td>Moderate Condition Class 2</td>
<td>Moderate</td>
<td>Moderately Altered</td>
<td>Uncharacteristic</td>
<td>Outside historical range of variation</td>
<td>Moderate</td>
</tr>
<tr>
<td>High Condition Class 3</td>
<td>High</td>
<td>Significantly different</td>
<td>Highly uncharacteristic</td>
<td>Substantially outside historical range of variation</td>
<td>High</td>
</tr>
</tbody>
</table>

(Source: *CDF FRAP 2003 Forest and Range Assessment*, p. 98)

*Defensible Space* – An area as defined by the AHJ (typically a width of 30 feet or more) between an improved property and a potential wildland fire where combustible materials and vegetation have been removed or modified to reduce the potential for fire on improved property spreading to wildland fuels or to provide a safe working area for fire.

**Disaster** – Disaster are characterized by the scope of an emergency. An emergency becomes a disaster when it exceeds the capability of the local resources to manage it. Disasters often result in great damage, loss, or destruction (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

**Dry Hydrant** – An arrangement of pipe permanently connected to a water source other than a piped, pressurized water supply system that proves a ready means of water supply for fire-fighting purposes and that utilizes the drafting (suction) capability of fire department pumpers (NFPA, *NFPA 1144*, 2002, p. 5).

**Dwelling** – One or more living units, each providing complete and independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking, and sanitation (NFPA, *NFPA 1144*, 2002, p. 4).

**Emergency** – A deviation from planned or expected behavior or course of events that endangers or adversely affects people, property, or the environment (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

**Fire Behavior** – The manner in which a fire reacts to the influences of fuel, weather, and topography (FIREWISE Communities, 2003, [http://www.firewise.org/communities](http://www.firewise.org/communities)).

**Fire Frequency** – A broad measure of the rate of fire occurrence in a particular area. For historical analyses, fire frequency is often expressed using the fire return interval calculation. For modern-era analyses, where data on timing and size of fires are recorded, fire frequency is often best expressed using fire rotation (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).

**Fire Hazard** – A fuel complex, defined by volume, type condition, arrangement, and location that determine the degree of ease of ignition and of resistance to control (FIREWISE Communities, 2003, [http://www.firewise.org/communities](http://www.firewise.org/communities)).

**Fire Hydrant** – A valved connection on a water supply system having one or more outlets and that is used to supply hose and fire department pumpers with water (NFPA, *NFPA 1144*, 2002, p. 5).

**Fire Lane** – A means of access or other passageway designated and identified to provide access for emergency apparatus where parking is not allowed (NFPA, *NFPA 1141*, 1998, p. 4).

**Fire Protection** – All measures taken to reduce the burden of fire on the quality of life. Fire protection includes measures such as fire prevention, fire suppression, built-in fire protection systems, and planning and building codes (NFPA, *NFPA 1141*, 1998, p. 4).
Fire Protection System – Any fire alarm device or system or fire extinguishing device or system, or their combination, that is designed and installed for detecting, controlling, or extinguishing a fire or otherwise alerting occupants, or the fire department, or both, that a fire has occurred (NFPA, *NFPA 1141*, 1998, p. 4).


Fire Regime – A measure of the general pattern of fire frequency and severity typical to a particular area or type of landscape: The regime can include other metrics of the fire, including seasonality and typical fire size, as well as a measure of the pattern of variability in characteristics (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).

Fire Rotation – An area-based average estimate of fire frequency, calculated as the length of time necessary for an area equal to the total area of interest to burn. Fire rotation is often applied to regionally stratified land groupings where individual fire-return interval across the variability of the strata (i.e., the fine scale pattern of variation in timing of fires) is unknown, but detailed information on fire size is known. Hence, fire rotation is a common estimate of fire frequency during periods of recorded fire sizes (*CDF FRAP 2003 Forest and Range Assessment*, p. A-12).


Fuels – All combustible material within the wildland/urban interface or intermix, including vegetation and structures (FIREWISE Communities, 2003, http://www.firewise.org/communities).


Fuel Models – Description of the types of vegetative combustible material:
- Light Fuels – grasses, forbs
- Medium Fuels – short light brush and small trees
- Heavy Fuels – tall dense brush, timber and hardwoods

Fuel Modification – Any manipulation or removal of fuels to reduce the likelihood of ignition or the resistance to fire control (FIREWISE Communities, 2003, http://www.firewise.org/communities).
GIS - See Geographic Information Systems


**Hazard** – Refers generally to physical characteristics that may cause an emergency. Earthquake faults, flood zones, and highly flammable brush fields are all examples of hazards (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110). Also see *Fire Hazard*.

**Healthy Forests Restoration Act (HFRA), 2003** – Gives incentives for communities to engage in comprehensive forest planning and prioritization. This legislation includes statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to give consideration to the priorities of local communities as they develop and implement forest management and hazardous fuel reduction priorities. The Act emphasizes the need for federal agencies to work collaboratively with communities in developing hazardous fuel reduction projects, and it places priority on treatment areas identified by communities themselves in a CWPP (Source: *Preparing a Community Wildfire Protection Plan*, March, 2004).

**Improved Property** – A piece of land or real estate upon which a structure has been placed, a marketable crop is growing (including timber), or other property improvement has been made (NFPA, *NFPA 1144*, 2002, p. 5).

**Intermix** – An area where improved property and wildland fuels meet with no clearly defined boundary (NFPA, *NFPA 1144*, 2002, p. 5).

**Ladder Fuels** – Fuels that provide vertical continuity allowing fire to carry from surface fuels in the crowns of trees or shrubs with relative ease (FIREWISE Communities, 2003, [http://www.firewise.org/communities](http://www.firewise.org/communities)).

**Mitigation** – Action that moderates the severity of a fire or risk (NFPA, *NFPA 1144*, 2002, p. 5).

**National Fire Protection Association (NFPA)** - a non-profit membership association that produces the National Fire Codes and fire and life safety educational material and programs (FIREWISE Communities, 2003, [http://www.firewise.org/communities](http://www.firewise.org/communities)).

**NFPA-1144 Standard for Protection of life and Property from Wildfire** – Standard developed by the NFPA to be used to provide minimum planning, construction, maintenance, education, and management elements for the protection of life, property, and other values that could be threatened by wildland fire. The standard shall be used to provide minimum requirements to parties responsible for fire protection, land use
planning, property development, property maintenance, and others responsible for or interested in improving fire and life safety in areas where wildland fire could threaten lives, property, and other values (NFPA, *NFPA 1144*, 2002, p. 4).

**Noncombustible** – Any material that, in the form in which it is used and under the conditions anticipated will not ignite and burn nor will add appreciable heat to an ambient fire (NFPA, *NFPA 1144*, 2002, p. 5).

**Overstory** – That portion of the trees in a forest that forms the upper or uppermost layer (FIREWISE Communities, 2003, http://www.firewise.org/communities).

**Risk** – The potential or likelihood of an emergency to occur. For example, the risk of damage to a structure from wildfire is high if it is built upon, or adjacent to, a highly flammable brush field or other area deemed to have a high Fire Threat (Greene, R.W., *Confronting Catastrophe*, ESRI Press, 2002, p. 110).

**Slope** – The variation of terrain from the horizontal; the number of feet rise or fall per 100 feet measured horizontally, expressed as a percentage (FIREWISE Communities, 2003, http://www.firewise.org/communities). Upward or downward incline or slant (NFPA, *NFPA 1144*, 2002, p. 5).

**Structural Ignitability** – The ability for a home or other building to catch fire and burn.

**Surface Fuels** – Fuels lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (FIREWISE Communities, 2003, http://www.firewise.org/communities).

**Turnaround** – A portion of a roadway, unobstructed by parking, that allows for a safe reversal of direction for emergency equipment (NFPA, *NFPA 1144*, 2002, p. 5).

**Turnouts** – A widening in a travelway of sufficient length and width to allow vehicles to pass one another (NFPA, *NFPA 1144*, 2002, p. 5).

**Understory** – Low-growing vegetation (herbaceous, brush or reproduction) growing under a stand of trees. Also, that portion of trees in a forest stand below the Overstory (FIREWISE Communities, 2003, http://www.firewise.org/communities).


**Wildfire** – Any fire occurring on undeveloped land; the term specifies a fire occurring on a wildland area that does not meet management objectives and thus requires a suppression response. Wildland fire protection agencies use this term generally to indicate a vegetation fire. Wildfire often replaces such terms as forest fire, brush fire, range fire, and grass fire (*CDF FRAP 2003 Forest and Range Assessment*, p. A-17).
Wildland – A region with minimal development as evidenced by few structures; transportation networks may traverse region. Region typically contains natural vegetation and may be used for recreational or agricultural purposes (CDF FRAP 2003 Forest and Range Assessment, p. A-17).

Wildland-Urban Interface (WUI) – Commonly described as the zone where structures and other human development meet and intermingle with undeveloped wildland or vegetative fuels. In the absence of a CWPP, Section 101 (16) of the HFRA defines WUI as “(I) an area extending ½ mile from the boundary of an at-risk community; (II) an area within 1 ½ miles of the boundary of an at-risk community, including any land that (1) has a sustained steep slope that creates the potential for wildfire behavior endangering the at-risk community; (2) has a geographic feature that aids in creating an effective fire break, such as a road or ridge top; or (3) is in condition class 3, as documented by the Secretary in the project-specific environmental analysis; (III) an area that is adjacent to an evacuation route for an at-risk community that the Secretary determines, in cooperation with the at-risk community, requires hazardous fuels reduction to provide safer evacuation from the at-risk community.” A CWPP offers the opportunity to establish a localized definition and boundary for the wildland-urban interface (Source: Preparing a Community Wildfire Protection Plan. March, 2004).
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