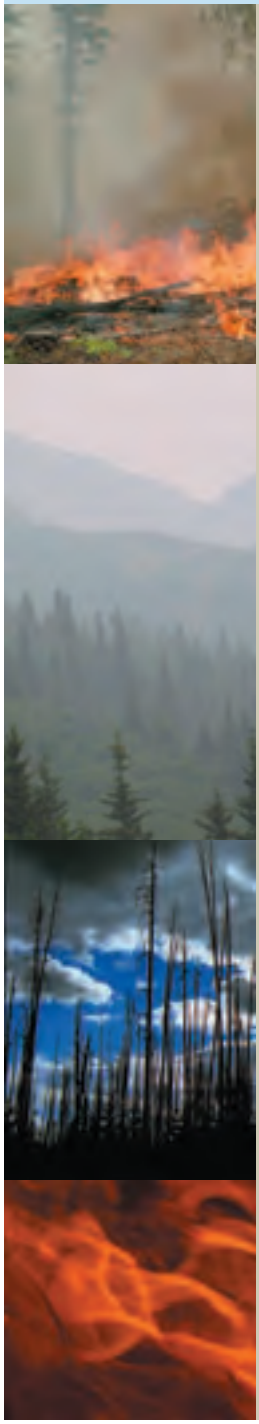
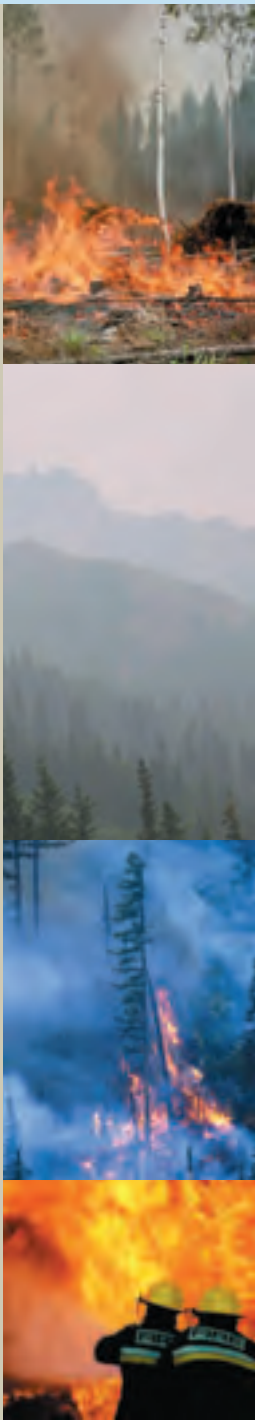
Quesnel & Area
Community Wildfire Protection Plan

March 2007





Fraser Basin Council

Cariboo Regional District

1. Acknowledgements

The Quesnel and Area Community Wildfire Protection Plan was produced by a group of dedicated individuals who contributed valuable knowledge and experience to this plan. Participants in the plan's development are listed in Appendix A.

The Fraser Basin Council, Cariboo-Chilcotin Region organized committee meetings and provided the facilitator, Gail Wallin, for the series of meetings held to produce this plan. Jane Perry of J. Perry Resource Communications served as the committee's writer for meeting support and plan development, and appreciated assistance from Mike Simpson, Fraser Basin Council.

Support and administration for the plan's development were provided by:

- Cariboo Regional District
- City of Quesnel
- Fraser Basin Council
- Union of BC Municipalities

Finally, special thanks are extended to Rhonda Underwood (City of Quesnel), Lisa Lefebvre (Ministry of Forests and Range) and Jiri Vosyka (Cariboo Regional District) for their help in building the complex mapping information that provides a sound foundation to this plan; to participants for their dedication of time and interest in helping make this a truly effective and useable plan for Quesnel and area; to Ric Raynor from the City of Quesnel for his effort in bringing together people from across Quesnel and area and distributing information to participants; and to the City of Quesnel for hosting participants at all of the meetings.

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2. Executive Summary

The Quesnel and Area Community Wildfire Protection Plan was developed to address the threat of wildfire to public safety and property values. Local individuals from a wide cross-section of the community (Appendix A) produced this plan for a defined area surrounding the City of Quesnel, British Columbia. The plan addresses the zone surrounding communities where low-density housing is often mixed with forested and cleared areas, referred to as the interface. This plan is presented to encourage governments, land users and residents to coordinate management activities. The plan has been developed to:

1. Recommend general actions to reduce the potential impacts of fire in the entire interface area;
2. List local recommendations with specific actions for the seven sub-units within the plan's area (Barlow Creek, Bouchie Lake, City of Quesnel, Kersley, Red Bluff, Ten Mile and West Fraser);
3. Initiate a public communications program on the risk of fire and its potential impacts; and
4. Encourage cooperative planning of land use and public services to minimize the impacts from future fires.

This plan was developed through a collaborative effort developed to influence a wide audience. It provides a basis for communications with the public, local governments, resource managers, utility companies and the media, and to audiences outside the plan area.

The plan's recommended actions are divided into two levels. The 24 actions pertinent to the entire plan area are listed as General Recommendations and are as follows:

1. Implement the FireSmart Homeowners Manual and use it as a "best practice."
2. Develop and distribute a procedure that enables and encourages landowners to remove both mer chantable and non-merchantable trees and forest fuels from private property and adjacent Crown lands.
3. Local governments should:
   - Adopt FireSmart standards;
   - Prepare a Development Permit policy within the Official Community Plan; and
   - Strengthen current bylaws and resolutions.
4. In the planning, development and approval of new subdivisions, the Approving Officer should ensure that planners and developers:
   - Apply FireSmart standards;
   - Provide access for new subdivisions and cul-de-sacs in accordance with FireSmart or other recognized standards; and
   - Identify and develop new water sources.
5. Clarify the current fire protection services available within the plan area, and recommend ways to expand and improve such services where practical and feasible.
6. Manage the fire hazard around public and private landfill sites.
7. Investigate options for reducing the fire hazard, including insurance incentives for communities that meet FireSmart standards and assistance from local governments.
8. Identify the data custodians responsible for the pertinent data layers for the Quesnel and Area Community Wildfire Protection Plan. Document the data standards and update procedures to ensure regular maintenance of information after all hazard management activities.
9. Road authorities, land managers and land owners should work together to develop, improve and maintain access throughout the plan area to reach potential fires and water sources.
10. Develop a plan to reduce or manage fuels on an area-specific basis, as described in the plan text. Ensure that all forest fuel reduction activities:

- Include consultation with agencies or groups responsible for managing the land use values identified in this plan; and
- Incorporate proper disposal methods.

11. Identify and access new and existing funding sources for communities, forest licensees, woodlot licensees and others to reduce forest fuels on key Crown and private lands, and ensure this information is publicly circulated.
12. Where open burning is necessary, promote its safe and efficient utilization in compliance with the *Wildfire Act* and Regulation, the Open Burning Smoke Control Regulation and local bylaws. Use the recommendations of the Airshed Management Plan regarding smoke emission as well as the Environment Canada-generated venting index and weather information to regulate where and when burning is permitted. Continue to seek out effective alternatives to open burning, such as recycling, composting and the use of low-emission burners.
13. Identify and map all water sources and their access to maximize water availability for firefighting throughout the plan area.
14. Animal evacuation plans should be developed with the rancher and the cattle owner (if not the rancher) and based on the animals' location during the grazing season, then shared with the local fire department.
15. Consult the available mapping of invasive plants by the Cariboo Regional District before under taking any fire hazard reduction activities, to prevent the spread of invasive plants during the implementation of this plan.
16. Ensure that forest fuel reduction activities retain habitat values for provincially listed endangered and threatened species.
17. Assess the critical factors provided by the utilities within the plan area and:
    - Prioritize key protection efforts for the most important and vulnerable sites;
    - Investigate unique services and available backup;
    - Locate and maintain copies of current protection plans developed by utility companies and organizations in a central location for reference;
    - Develop linked action plans to minimize risk; and
    - Ensure debris disposal techniques are in accordance with the plan.
18. Share fire hazard information with the public in a variety of ways that increase general public awareness with the entire population of the plan area, or addresses specific audiences, such as neighbourhood groups.
19. Establish forest fuel reduction pilot projects and demonstration areas on highly visible, accessible sites.
20. Develop and implement a communications plan that covers the impacts of fire and how to address them, based on the Quesnel and Area Community Wildfire Protection Plan.
21. Develop a Quesnel and Area Community Wildfire Protection Plan website (either a separate domain or through a link) for posting the plan, committee meeting summaries, fire hazard map and all other relevant information.
22. Develop a media plan for the Quesnel and Area Community Wildfire Protection Plan Committee that encourages media reporting about reducing fire risk and fire hazard.
23. Based on requests from community groups, offer volunteer site hazard assessments to the public by experienced specialists, and provide recommendations on managing forest fuel debris.
24. The entire Quesnel and Area Community Wildfire Protection Plan committee should meet at least once annually to present and prepare an annual report.

Each of the plan's seven sub-units has specific actions listed as Sub-Unit Actions in Appendix C. Along with specific recommendations for each sub-unit, the following four recommendations are included for all sub-units as a high priority:

1. Implement the FireSmart program with local residents.
2. Review road and bridge access and explore alternate routes.
3. Provide support to the local volunteer fire department.
4. Review and identify sites for pilot projects.

Following the development of this plan by a diverse group of individuals, the plan's successful implementation is very important. A committee is recommended in the final general recommendation to ensure the plan is kept alive and implemented. The committee should meet at least once annually and prepare an annual report that documents how it has addressed the plan's recommendations.

3. Introduction

3.1 Purpose

The Quesnel and Area Community Wildfire Protection Plan was developed to address the threat of wildfire to public safety and property values. The plan was produced in response to concerns held by the City of Quesnel, representatives from outlying communities and neighbourhoods, the Cariboo Regional District, and the Union of BC Municipalities. It was also initiated as a result of the Firestorm 2003 report recommendations (Filmon 2004).

Local individuals from a wide cross-section of the community (Appendix A) produced this plan for a defined area surrounding the City of Quesnel, British Columbia (Figure 1). The plan addresses the zone surrounding communities where low-density housing is often mixed with forested and cleared areas, referred to as the interface. This plan is presented to encourage governments, land users and residents to coordinate management activities. The plan has been developed to:

1. Recommend general actions to reduce the potential impacts of fire in the entire interface area;
2. List local recommendations with specific actions for the seven sub-units within the plan's area;
3. Initiate a public communications program on the risk of fire and its potential impacts; and
4. Encourage cooperative planning of land use and public services to minimize the impacts from future fires.

The Quesnel and Area Community Wildfire Protection Plan was developed to address the threat of wildfire to public safety and property values. The plan was produced in response to concerns held by the City of Quesnel, representatives from outlying communities and neighbourhoods, the Cariboo Regional District and the Union of BC Municipalities about the impacts of fire.

The Quesnel and Area Community Wildfire Protection Plan was developed through a collaborative effort designed to influence a wide audience. The plan provides a basis for communications with the public, local governments, resource managers, utility companies and the media, and to audiences outside the plan area.

A glossary of the specialized terms used in this plan is provided in Appendix B.

3.2 Process

The Quesnel and Area Community Wildfire Protection Plan Committee worked through 2006, from its first meeting in February to completion in December. The committee originated from a comprehensive invitation list sent by the City of Quesnel. The process used to develop this plan included the following steps:

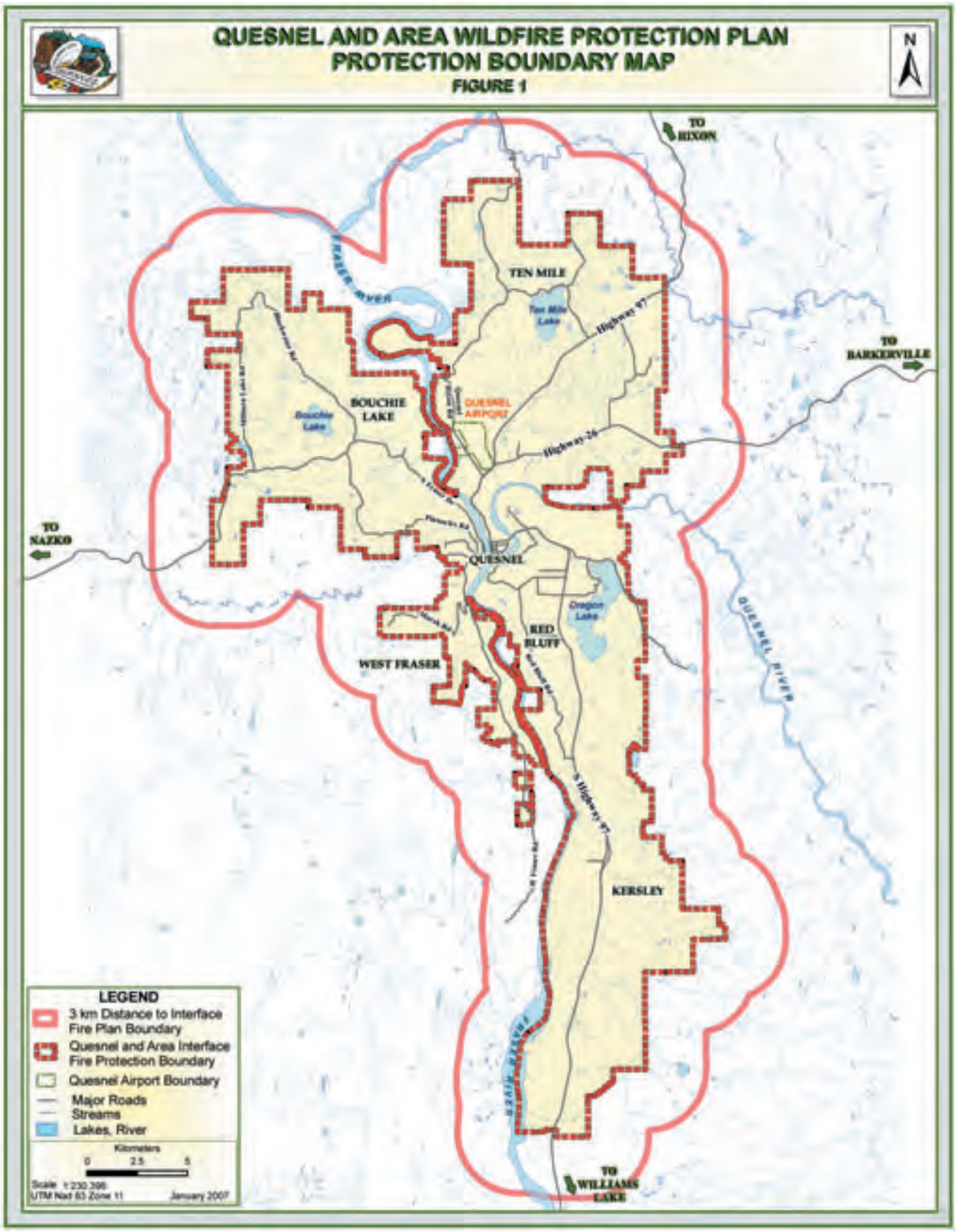

Figure 1. Geographic area addressed by the Quesnel and Area Community Wildfire Protection Plan.

1. Convene decision makers.
2. Involve provincial agencies with a range of land management specialists.
3. Engage interested parties.
4. Establish a community base map for the defined plan area.
5. Develop a risk assessment to prioritize areas for treatment based on a variety of risk factors, and display on the base map.
6. Establish community hazard reduction priorities based on diverse community involvement.
7. Develop an action plan that identifies roles, responsibilities, funding needs and timetables along with an assessment strategy to maintain long-term relevance.
8. Finalize the community wildfire protection plan.

The plan's recommended actions are divided into two levels. Actions pertinent to the entire plan area are listed as General Recommendations beginning in Section 5. For the seven sub-units within the plan's defined area, actions are listed as Sub-Unit Actions in Appendix C.

3.3 Plan Area

This community wildfire protection plan applies to the area in and around the city of Quesnel, in the Central Interior of British Columbia. With a total population of approximately 25,000 residents, the plan area includes the city situated at the confluence of the Fraser and Quesnel rivers (elevation 474 m) and six surrounding rural communities of subdivisions and rural residences. The area surrounding the city consists of rolling plateau terrain (elevations up to approximately 800 m) interspersed with significant valleys and both minor and moderate gullies. Much of the plan area is forested, predominantly with Douglas-fir, spruce, lodgepole pine, trembling aspen, cottonwood and white birch. The plan area lies within the SBSmh (Sub-Boreal Spruce moist hot) and SBSdw1 (Sub-Boreal Spruce dry warm) biogeoclimatic subzones, with the SBSmh found in the valleys and the SBSdw1 at higher elevations.

The plan area includes the following areas surrounding the City of Quesnel:

- Barlow Creek to the northeast,
- Bouchie Lake to the west,
- Kersley at the south end of the plan area,
- Red Bluff to the south of the city,
- Ten Mile at the far north end of the plan area, and
- West Fraser at the southwest edge of the plan area.

This community wildfire protection plan focuses on what residents, agencies and businesses can do to reduce the impact of a wildfire to the Quesnel and area community.

The surrounding areas were originally determined by the boundaries of the respective volunteer fire departments. The final plan area was determined by establishing a buffer around the defined area to smooth out any jagged boundaries and include small outlying communities.

3.4 Fire Ecology

The forests surrounding Quesnel have a varied species composition as a result of their fire history and other factors. To the south and east of the city, encompassing the areas of Red Bluff and Kersley, uneven-aged stands of Douglas-fir predominate and are interspersed with open range and cultivated fields. Lodgepole pine forests, mixed with spruce and Douglas-fir, are prevalent north of the city in the Ten Mile and Barlow Creek areas. The areas west of the city, including West Quesnel, Bouchie Lake and West Fraser, have a significant component of broadleaf species such as birch.

Uneven-aged Douglas-fir stands have clumps of trees of similar ages that have regenerated naturally over time. Trees range in age from tiny seedlings growing from new germinants, to tall Douglas-fir veterans that are several hundred years old. These stands traditionally experienced frequent, low-intensity wildfires that served to maintain the natural stand structure. Frequent light fires removed patches of young, vulnerable trees and the lower branches of larger trees, while allowing the older Douglas-fir with thick, fire-resistant bark to survive.

Lodgepole pine stands have resulted from large-scale, intense disturbances that destroyed entire stands of trees. Lodgepole pine has serotinous cones: they release seed when exposed to temperatures over 45°C (Perry and Lotan 1977). This occurs when intense fires have burned an entire stand, cones fall to the ground, and surface temperatures of the blackened soil exceed this temperature. After such disturbances, lodgepole pine stands regenerate in a single age class, or as an even-aged stand. The mountain pine beetle has produced high mortality in many mature and younger lodgepole pine stands in recent years, significantly increasing the fire hazard of these stands.

Broadleaf stands on the west side of the Fraser River consist of deciduous hardwood trees, such as birch, aspen and cottonwood. These trees are considered pioneer species after a forest disturbance, and are generally short-lived compared to conifers. They reproduce themselves through root suckering (aspen) and coppicing (birch) after harvesting, and through the voluminous production of light seed that is easily transported by wind. Broadleaf species regenerate best in open areas with lots of light. Broadleaf stands generally present a low fire hazard, since they do not contain combustible resins as conifers do. Conifers such as spruce and balsam often regenerate in the understory of these stands, and as the broadleaf species die, the forest converts to a spruce or balsam forest, with a significantly higher fire hazard.

Before European settlement, First Nations peoples used fire to reduce the threat of wildfire and to modify habitat for hunting and food plants. Beginning in the 1860s, ranchers likely burned lodgepole pine stands to increase grass availability for grazing livestock (UBC/Alex Fraser Research Forest 2005). Fire control was introduced by the BC Forest Service when it was established in 1912, and successful wildfire suppression has changed the forests of British Columbia's Interior considerably from their natural state.

Until approximately a century ago, Douglas-fir stands typically had fewer small to medium-sized trees and scattered big, old trees. Similarly, for lodgepole pine stands, there is a significantly larger area of old pine stands than what would have been present without fire suppression. Human modification of the fire regime, however, has produced forests with:

- unusually high densities of small to medium-sized trees,
- higher retention of lower branches on intermediate and old trees, and
- greater competition among all tree size classes, resulting in increased risk for infestation to forest health agents, such as the Douglas-fir bark beetle.

These conditions have produced forests that burn hotter, more destructively and less predictably when a fire ignites.

4. Considerations Influencing Interface Fire Planning

This interface fire plan relies on important terms. Fire Risk is defined as the likelihood, or probability, of a fire starting, determined by the presence and activities of causative agents (Ministry of Forests 2005). Fire Hazard is the potential fire behavior for a fuel type, or the potential impacts of a fire.

Fire risk and fire hazard differ in how they are evaluated, addressed and managed. The most effective way to reduce human-caused fire risk is to address human behaviour to decrease ignition sources and probabilities. This is addressed in Section 6 on public communications. Fire hazard can be addressed by management activities to help reduce a fire's impacts on land and property values. Measures can be taken in advance to reduce forest fuels, for example. Managing fire hazard is a proactive venture that involves activities carried out in the near future to protect values in the longer term.

The Quesnel and Area Community Wildfire Protection Plan Committee identified seven considerations that influence fire planning, each of which is described below.

4.1 Weather

Weather patterns affect fire planning because periods of the fire season with higher risk must be foreseen and prepared for accordingly. Monthly weather data for mean temperature and total precipitation in Quesnel are provided for the fire season months of April to October in Appendix D.

One of the important aspects of weather and its relationship to wildfire is around climate change and global warming. On a national level, the spring of 2006 was the warmest Canada has experienced since nationwide records began in 1948, 3.0°C above normal (based on preliminary data); the previous record holder was 1998, at 2.9°C above normal. Almost all of Canada experienced above-normal temperatures, with most of the country at least 2°C above normal. The winter of 2005-06 saw the highest seasonal temperatures on record, 3.9°C above normal. With the exception of the springs of 2002 and 2004, seasonal temperatures have remained above normal for the last nine years. Furthermore, Canada experienced a wetter than normal spring in 2006, 8.9% above normal precipitation (again, based on preliminary data), ranking spring, 2006 as the ninth wettest recorded.

4.2 Ignition

A second consideration of fire risk is ignition, which includes sources such as lightning, humans, prescribed burning, forestry equipment and industrial activity. Three-quarters of the 87 fires in the last decade (1995–2005) were under 1 hectare in size (Ministry of Forests and Range 2006). Most of the 242 fires within the plan area during the previous decade of 1985–1995 were ignited from other fires (28%), but included miscellaneous causes (24%) and lightning (17%). Most fires (71%) were under 1 hectare in size. And in the prior decade (1975–1985), only 68 fires were ignited.

Successful suppression activities have created an overall decrease in fire size, which has led to an increase in fuel loading in forested areas. The increased fuel load has, in turn, led to fires with higher potential intensities and increased control difficulties for suppression agencies. The incidence of human-caused fires has declined, even with increases in population, industrial activity and recreational use. The area for this community wildfire protection plan would be categorized from these data as a moderate fire risk, based on a

People can reduce fire risk by taking extra care with human-caused ignition sources such as campfires, cigarettes and debris burning.

provincial standard (the Interface Community Hazard Form) and compared to other communities in British Columbia—for example, communities in warmer and drier areas in southern BC with higher populations. Climate change and the longer fire season may further change the ignition risk. A moderate rating indicates the potential for a large, destructive fire burning in the interface area at considerable risk to lives and both private and public property values.

4.3 Forest Fuels

Wildland fire behaviour is defined as the manner in which fuel ignites, flame develops, and fire spreads and exhibits other related phenomena as determined by the interaction of fuels, weather and topography (Canadian Interagency Forest Fire Centre 2003). Of the three components that combine to create a forest fire—fuel, weather and topography—forest fuel is the only one that can be modified.

Forest fuels are the needles, branches, logs, grass, trees, brush and other debris that are typically consumed by a forest fire. The arrangement and amount of forest fuel is directly linked to the potential intensity of a wildfire, and the presence of high quantities of forest fuels can lead to an increase in fire intensity. Increased fire intensity negatively affects the ability of suppression agencies to successfully control or manage a fire. By reducing forest fuels and thereby reducing the potential intensity of a fire, the likelihood of success by firefighters to manage a fire is increased. In the event of a fire reaching an interface area, the management of forest fuels, combined with the application of FireSmart principles (see 5.1.1) to the structure and immediate surroundings, will reduce the chance for structural ignition.

Current methods of forest fuel reduction include prescribed fire, removal of ground fuels and ladder fuels, thinning of understory trees and commercial harvesting. Fire intensity may also be reduced by converting stands to less flammable forest fuels such as managing a coniferous stand to include a higher percentage of deciduous cover. Modification of forest fuels by creating breaks in the fuel on the surface and in the forest canopy also can create opportunities for firefighters that may lead to successful suppression activities.

Ember transport (spotting) accounts for a high percentage of structural ignition to buildings. The spotting distance map (Figure 2) indicates forested areas that may pose a threat of spotting into the interface. The spotting distance map is a combination of head fire intensity, material available for ember transport, structural density, and known spotting distances in different fuel types.

4.4 Population

Settlement patterns in the plan area are centred in the City of Quesnel with its population of over 11,000. The remaining approximately half of the population within the plan area lives in subdivisions and rural properties located along transportation corridors (Highways 97 and 26 and the Nazko Road), and the major valleys of the Fraser and Quesnel rivers. Despite reduced fire from a successful, long-term fire suppression program, the general growth of population and recreational use within the plan area increases the concern and impacts if fire was to occur.

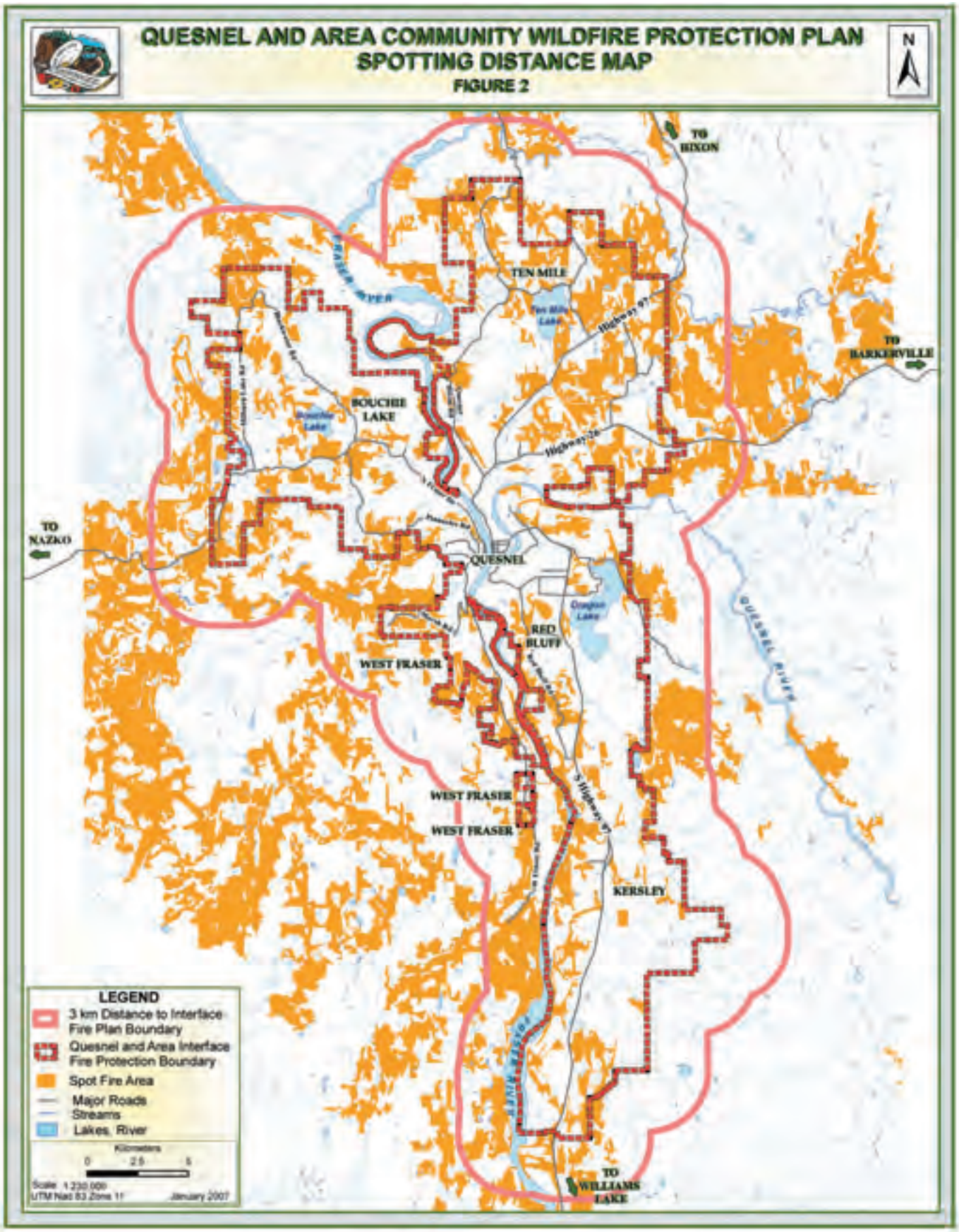

Figure 2. Spotting distance map.

4.5 Investment and Infrastructure

Investment includes residential and private dwellings throughout the plan area as described above, along with infrastructure investment by government, utilities and service providers, such as:

- Transmission lines and substations through the centre of the plan area, east of the Fraser River;
- The Spectra Energy (formerly Duke Energy) pipeline running roughly north–south through the eastern portion of the plan area;
- Communications equipment and the repeater towers at Dragon Mountain and Milburn Mountain, both just outside of the plan area;
- The Quesnel Airport, located within the city limits;
- For aeronautical navigation, the Nav Canada non-directional beacon located on Maple Drive, 6.7 kilometres from the airport, and the four hazard beacons, located at Moose Heights, Longbar and southeast of the airport near Highway 26 along with one aerodrome beacon situated adjacent to the airport;
- Two cellular towers;
- BC Hydro substations on the North Star Road and Brownmiller Road in the City, and on Hillcrest Road off Highway 26;
- Telus communications exchanges within the City and on Agate Road and Pinnacles Road outside the City, along with telephone lines throughout the plan area;
- Water supply;
- Sewage systems that pump uphill;
- CN Rail lines and the marshalling yard in the City;
- Two secondary schools within the City of Quesnel and a total of over 20 other schools and educational institutions within the plan area; and
- Firehalls and community halls in most of the outlying communities from Quesnel.

4.6 Water

Water is a resource required to reduce the size and impacts of a fire. Some natural and artificial water sources have been installed within the plan area. City water is mostly available through fire hydrants and water tenders, and some fire halls such as Ten Mile and Kersley have installed storage tanks. Some static water sources are also available, but are not widely used.

4.7 Emergency Preparedness

The City of Quesnel has a well-established emergency preparedness program that identifies an “all risk” approach to preparedness, response and recovery. The Cariboo Regional District implemented its emergency preparedness program in 2005. The program involves ongoing development, coordination, maintenance and implementation of programs, protocols and processes to lead and coordinate effective responses to, and recovery from, any kind of public emergency or disaster affecting the regional district. Fire is considered the most important risk. The City and Cariboo Regional District follow the principles of the BC Emergency Response Management System and support relevant agencies and organizations (e.g., Ministry of Forests and Range, and local volunteer fire departments) in managing large evacuations and public information.

5. General Recommendations to Reduce Fire Impacts

Reducing the impacts of fire in the plan area requires a coordinated and dedicated effort by all individuals and agencies involved. The potential of a fire can only be addressed through the positive influence on human behaviour in handling campfires, cigarettes and open burning. In contrast, there is clear potential to mitigate the impacts of fire through various activities. However, it is important to point out that as wildfires respect no administrative boundaries, well-managed private property or Crown land may still be threatened by adjacent areas with a higher fire hazard. Therefore, successful implementation of this community wildfire protection plan requires that everyone recognize the potential impacts of fire and work together to reduce them.

Successful implementation of this community wildfire protection plan requires that everyone recognize the impacts of fire and work together to reduce them.

This section of the plan outlines the specific recommendations for residents, local governments, developers, land managers, utility companies and First Nations to reduce the potential impacts of fire. These General Recommendations summarize recommended actions that apply to the entire plan area.

5.1 Residents

Most residents in the interface live in subdivisions with property areas ranging from urban- and suburban-sized lots up to about four hectares, or within ribbon corridors of development along major access roads. Residents need to be fully aware of, and willing to implement, available measures to reduce the potential impacts on their property. This will significantly reduce the potential for extensive loss of property values in the event of a destructive fire.

5.1.1 FireSmart

FireSmart is a program developed in Alberta, and modified for use in British Columbia, to prevent loss, damage and injury from interface wildfires. FireSmart includes an interactive manual on protecting communities from wildfire (Partners in Protection 2005) and a smaller FireSmart Home Owners Manual that outlines how property owners can renovate their buildings to increase fire resistance, develop a protection plan for their property and buildings, and assess the hazard of their home and site (BC Forest Service et al.) This booklet is a useful source of information for the public to assess and address the fire hazard on their property.

Recommendation #1

Implement the FireSmart Homeowners Manual and use it as a “best practice.”

5.1.2 Tree Removal

Many subdivision residents with forested property will need to remove coniferous trees to meet the FireSmart guidelines. In particular, dead lodgepole pine recently killed by the mountain pine beetle has become a concern, not only for fire but also for windthrow because these trees will rot and may fall over. Consequently, timber harvesting on small properties is expected to increase in the near future.

A forestry licence to cut may be the best option to enable harvesting of small volumes of Crown timber. This tenure allows for a volume of timber that is dead or in danger of being significantly reduced in value, with the total volume less than 2,000 m^3 (*Forest Act*, section 47.6).

Landowners must have the appropriate permits and authorizations in place prior to conducting activities on Crown land. The best means for private individuals to do this work is through the local fire hall and the plan implementation committee to ensure a coordinated effort in hazard abatement. Communication of plans and activities is critical to ensure local landowners meet all legal requirements.

All commercial timber trucked to a sawmill requires a timber mark to designate its origin. This requirement means that many property owners with low amounts of commercial timber will require individual timber marks or on-site scaling. Establishing a practical system within the Ministry of Forests and Range for a group timber mark or allowing mixed loads will simplify the process for property owners and consequently help to reduce standing dead timber. A process is similarly required for Crown land harvesting of small volumes.

Recommendation #2

Develop and distribute a procedure that enables and encourages landowners to remove both merchantable and non-merchantable trees and forest fuels from private property and adjacent Crown lands.

5.2 Local Governments

5.2.1 Planning

Local governments play an important role in planning to help reduce fire risk through access development, subdivision design, development permits, Official Community Plans and resolutions. In addition to voluntary measures, bylaws and regulations may be required to achieve universal coverage throughout the Cariboo Regional District. The *Local Government Act* provides for Development Permits Areas for a multitude of reasons, including reducing the wildfire hazard. Official Community Plans are adopted by bylaw and can influence planning (for example, through development permits) and enforcement.

As a local government, the Red Bluff Indian Band has four reserves within the plan area, just south of the city of Quesnel. Quesnel Reserve No. 1, consisting of 553 ha of land south of Quesnel on the east side of the Fraser River, is the most populated reserve. Sinnce-Tah-Lah Reserve No. 2 is 18 ha in size, and is located west of the Fraser River. Dragon Lake Reserve No. 3 is located at the north end of Dragon Lake, and is 15 ha in size. Richbar Reserve No. 4 is 96 ha in size, and is located on the east side of the Fraser River. The Band passes resolutions for planning on reserve lands.

Recommendation #3

Local governments should:

- Adopt FireSmart standards;
- Prepare a Development Permit policy within the Official Community Plan; and
- Strengthen current bylaws and resolutions.

Recommendation #4

In the planning, development and approval of new subdivisions, the Approving Officer should ensure that planners and developers:

- Apply FireSmart standards;
- Provide access for new subdivisions and cul-de-sacs in accordance with FireSmart or other recognized standards; and
- Identify and develop new water sources.

5.2.2 Fire Protection Services

Some areas within the plan area are not currently covered by fire protection services. Fire protection services can provide the most effective means of initial attack in the early stages of a fire.

Recommendation #5

Clarify the current fire protection services available within the plan area, and recommend ways to expand and improve such services where practical and feasible.

5.2.3 Landfill Sites

The City of Quesnel manages one public landfill site within the plan area. Private landfills, primarily for hog fuel and other industrial wastes, exist as well. It is necessary to reduce the fire hazard surrounding landfill sites to minimize the potential for a fire caused by arson or spontaneous combustion to spread into the surrounding forest. It will be necessary to consider the buffers, site-specifically based on conditions such as forest cover and slope.

Recommendation #6

Manage the fire hazard around public and private landfill sites.

5.2.4 Incentives

Local governments can support different incentives aimed to reduce the fire hazard. They can work in consultation with provincial agencies on administrative measures that enable private landowners to sell small amounts of timber. Additionally, the expected trend is that homeowners insurance coverage will require inspections to verify the meeting of FireSmart standards within the interface. Reduced insurance rates would provide a valuable incentive for homeowners.

Recommendation #7

Investigate options for reducing the fire hazard, including insurance incentives for communities that meet FireSmart standards and assistance from local governments.

5.3 Land Managers

Land within the interface includes agricultural and forested Crown land, both federal and provincial. Provincial Crown lands may be surveyed or unsurveyed. Many fire hazard reduction activities on provincial Crown forested land will be conducted by forest licensees, which could be forest companies, BC Timber Sales or a woodlot licensee working as the agent. Federal lands in the interface area are restricted to reserves which are managed by the bands in conjunction with Indian and Northern Affairs Canada and other federal agencies.

5.3.1 Mapping

Provincial mapping information is housed in a central repository, the Land and Resource Data Warehouse. Each map layer is assigned a data custodian responsible for the accuracy and integrity of the data. Municipal governments maintain data related to local infrastructure. Information should be updated and submitted to the appropriate data custodian after all hazard management activities, such as thinning or other tree removal, and whenever new water sources are developed.

Recommendation #8

Identify the data custodians responsible for the pertinent data layers for the Quesnel and Area

Community Wildfire Protection Plan. Document the data standards and update procedures to ensure regular maintenance of information after all hazard management activities.

5.3.2 Vehicle Access

Good access is required throughout the plan area to reach both new fires and water sources. Land managers are encouraged to work with landowners to develop new access routes, as required. Evacuation routes should also be developed where they need to be built or upgraded, particularly where minimal investment is required, to reach potential fires and water sources and to collaborate on evacuation routes for residents and livestock.

Recommendation #9

Road authorities, land managers and land owners should work together to develop, improve and maintain access throughout the plan area to reach potential fires and water sources.

5.3.3 Forest Fuel Reduction

Direct activities can be undertaken to reduce potential fire-causing forest fuels to reduce the potential impacts of fire as a precautionary measure. Many of the activities outlined below will help to restore drybelt Douglas-fir forests in the interface area to a more natural condition. Forest fuel reduction treatments should be included in Forest Stewardship Plans for forest land within the interface area. Treatment plans should address the measures that will be undertaken to reduce forest fuels, improve emergency and operational access, minimize noise and smoke near residential areas, and other local concerns. Additional work is required to identify operational treatment sites, and funding must be made available for these treatments.

Some land use classifications pose limitations to forest fuel management. For example, the interface area includes zones classified for visual quality, mule deer winter range and grassland benchmark areas, along with Old Growth Management Areas and the Agricultural Land Reserve. All activities to reduce forest fuels should be planned in consultation with the agencies or groups responsible for managing the land use values identified in this plan.

Where grasses pose a fire hazard, cattle grazing may be desired to reduce forest fuels. Spring burning of grasses is often helpful, and while the site-specific necessity of spring burning of grasses needs to be determined, alternative grass control methods can also be used where possible.

A procedure is required to enable landowners to remove non-merchantable fuels from adjacent Crown lands in conjunction with work they are conducting on private property. The procedure should support the incentive for private landowners to reduce the fire hazard on Crown land adjacent to their property as an additional degree of reduced forest fuels.

Recommendation #10

Develop a plan to reduce or manage fuels on an area-specific basis, as described in the plan text. Ensure that all forest fuel reduction activities:

- Include consultation with agencies or groups responsible for managing the land use values identified in this plan; and
- Incorporate proper disposal methods.

Recommendation #11

Identify and access new and existing funding sources for communities, forest licensees, woodlot licensees and others to reduce forest fuels on key Crown and private lands, and ensure this information is publicly circulated.

5.3.4 Debris Disposal

Fuel management treatments often employ open burning to dispose of woody debris. Open burning is regulated within the city limits by the City of Quesnel and beyond the city limits by the Ministry of Forests and Range. The Ministry of Environment Open Burning Smoke Control Regulation affects all areas based on the Environment Canada-generated venting index and weather information to regulate where and when burning is permitted. The Quesnel Airshed Management Plan (2004–2014) makes recommendations for reducing particulates and emissions from all contributing sources, including backyard and open burning for Quesnel and the surrounding area (Quesnel Air Quality Roundtable 2004). Licensees and the public are responsible for obtaining current information and making appropriate burning decisions (Ministry of Forests and Range 2005).

Alternatives to burning include chipping, mulching, burying, and removal of the material from the site. Better disposal methods are required. The volume of woody debris can become excessive at landfills, and the mulching and chipping of material does not adequately reduce the fuel hazard when left onsite.

Recommendation #12

Where open burning is necessary, promote its safe and efficient utilization in compliance with the *Wildfire Act* and Regulation, the Open Burning Smoke Control Regulation and local bylaws. Use the recommendations of the Airshed Management Plan regarding smoke emission as well as the Environment Canada-generated venting index and weather information to regulate where and when burning is permitted. Continue to seek out effective alternatives to open burning, such as recycling, composting and the use of low-emission burners.

5.3.5 Water Sources

All water sources suitable for firefighting within the plan area should be identified and mapped so that geographic gaps in coverage are known and can be developed. Local knowledge of unmapped sources, such as springs, should also be included. As well, access to identified water sources must be maintained so that the water is available during a fire. This requires annual inspections of these water sources and their access.

Recommendation #13

Identify and map all water sources and their access to maximize water availability for firefighting throughout the plan area.

5.3.6 Range and Cattle

Cattle grazing is conducted in parts of the plan area. Natural barriers to animal movement and existing fences should be kept during fire access or hazard management. Grazing can also be used to reduce the fire hazard by controlling fuels.

Recommendation #14

Animal evacuation plans should be developed with the rancher and the cattle owner (if not the rancher) and based on the animals' location during the grazing season, then shared with the local fire department.

5.3.7 Invasive Plants

Increased access for fire hazard reduction and fire control may spread noxious weeds and other invasive plants by people, livestock and equipment. Additionally, ground disturbance from access development may increase the potential for seeding-in and establishment of invasive plants on new sites. Successful implementation of this wildfire protection plan requires taking action to prevent the spread of invasive plant seeds and foliage during fire hazard reduction and fire rehabilitation activities.

Recommendation #15

Consult the available mapping of invasive plants by the Cariboo Regional District before undertaking any fire hazard reduction activities, to prevent the spread of invasive plants during the implementation of this plan.

5.3.8 Species at Risk

There are currently 37 provincially red- and blue-listed species (considered endangered or threatened, respectively) under the *Wildlife Act* known to reside in the Quesnel Forest District, and some are present within the plan area. Key habitats are being mapped for protection during firefighting, where possible.

Recommendation #16

Ensure that forest fuel reduction activities retain habitat values for provincially listed endangered and threatened species.

5.4 Utility Companies

Utilities such as communications stations and energy transmission corridors provide essential services to residents, emergency crews and the public, and therefore must be well-protected from fire. The loss of any service for energy, communications, travel and residential services could further increase the impacts of a wildfire.

Recommendation #17

Assess the critical factors provided by the utilities within the plan area and:

- Prioritize key protection efforts for the most important and vulnerable sites;
- Investigate unique services and available backup;
- Locate and maintain copies of current protection plans developed by utility companies and organizations in a central location for reference;
- Develop linked action plans to minimize risk; and
- Ensure debris disposal techniques are in accordance with the plan.

6. Public Communications

Communicating effectively with the public about fire in the interface is expected to significantly reduce the chance and impacts of fire through a coordinated, community-based effort. This requires communicating important, consistent messages on fire hazard reduction measures and periods of high risk for ignition. As well, it will require ensuring the public has a formal voice to inform the committee on ways to improve its work.

The importance of public information and education about fire hazard reduction cannot be stressed enough for the plan's overall implementation success. This includes responsibility for private property

as part of the community effort to limit the effects of fire on homes, ranches and utilities. Public information will be provided in a variety of formats to gain the public's attention and understanding, and to reinforce key messages. Communications methods should emphasize personal contact, particularly for local concerns (e.g., in areas with local operational activity), but be supplemented with information resources to most successfully convey the impacts of fire to the community (McCaffrey 2004).

Successful implementation of this interface fire plan requires public understanding, support and action.

6.1 Public Support

The public has one of the most important and diverse roles in reducing the fire risk and hazard within the interface. First, everyone can help to reduce the risk of fire by complying with burning restrictions on private and Crown land, and respecting the potential impacts of human-caused ignition sources such as campfires, cigarettes and machinery. The public has a choice between environmentally sound ways to reduce wood waste or possibly small amounts of smoke from controlled burning compared to excessive smoke from an uncontrolled fire, and needs to understand this fundamental choice for longer term safety.

Second, the public needs to recognize that fire hazard is collective and wildfires do not abide by fences between properties with different fire hazards. For example, one or more lots with a high hazard within a subdivision may negate the efforts of adjacent property owners who have followed FireSmart guidelines. Reducing the collective fire hazard requires that everyone participate. Furthermore, the embers produced by a fire can often travel considerable distances and threaten areas with lower fire hazard if the conditions are conducive.

Recommendation #18

Share fire hazard information with the public in a variety of ways that increase general public awareness with the entire population of the plan area, or addresses specific audiences, such as neighbourhood groups.

6.2 Demonstration Projects

Demonstration projects enable the testing of different management approaches over time in an operational environment. Their aim is to help observers learn from the project to apply the findings in future management decisions.

Establishing demonstration areas will test different hazard reduction methods in an operational learning environment.

Demonstration projects are a high priority for the plan area, to test different fire hazard reduction methods and exhibit them in a living environment to land managers, community leaders and the public. Additionally, these projects will serve as demonstration sites for the public to better understand methods for reducing the fire hazard on their own property.

Recommended sites within the plan area for demonstration areas, or pilot projects, include:

- Airport lands;
- Kersley;
- Parkland community lands;
- Pinnacles Provincial Park; and
- Ten Mile Lake Provincial Park.

Recommendation #19

Establish forest fuel reduction pilot projects and demonstration areas on highly visible, accessible sites.

6.3 Communications Plan

A communications plan for the Quesnel and Area Community Wildfire Protection Plan is required to outline the purpose, methods and desired results of extension and outreach of the plan. The plan should cover a variety of means to share and receive information with the public, as described below.

Developing and implementing an effective communications plan is essential to build proactive action by all parties, including residents, to reduce fire risk and fire hazard.

6.3.1 Message

Informing the public about fire risk and hazard requires the use of a clear and consistent message by all parties. Additionally, ongoing communications must avoid creating a false sense of security during, for example, a wet spring when many people may not understand the rapid drying effects during a spell of hot summer weather and the subsequent increase in fire hazard. The message should be repeated in all printed and verbal communications, as outlined in this section of the plan.

6.3.2 Information Sessions

Investigate public interest for individual information sessions about the wildfire protection plan and what residents can do to reduce the fire hazard. One example is to hold information sessions at local fire halls on a variety of dates (e.g., two or three sessions held annually) to maximize involvement by local citizens.

6.3.3 Open House Events

Open House events are regularly hosted jointly by the City of Quesnel and the Cariboo Regional District. As well, the Quesnel Airport annually hosts an Airport Day in late May. Special Open House events should be additionally arranged to present this community wildfire protection plan. All Open House events should incorporate the portable display (described in 6.3.4) and other information about the Quesnel and Area Community Wildfire Protection Plan.

6.3.4 Portable Display

A portable, free-standing display should be produced for the Quesnel and Area Community Wildfire Protection Plan Committee to use for mall displays, Open House events and presentations by committee members. The display would be designed to inform the public of the community wildfire protection plan and its implementation, the impacts of fire and the committee's role. The display will be a prominent poster structure of the type used at trade fairs and public information events. Production of the display would be coordinated by the committee, and its use will be scheduled and booked through one contact agency or individual. The display would be available for National Forestry Week, National Fire Prevention Week in October and for other community events, such as the Billy Barker Days parade.

6.3.5 Poster

A well-designed, eye-catching poster should be developed and distributed for use in public government buildings, schools, the Quesnel Airport, and other suitable areas to remind the public about the impacts of fire and what they can do to minimize them.

6.3.6 Mascot

Consider producing a publicly appealing mascot, logo or slogan for interface fire management in Quesnel and area. The product will be designed for frequent, consistent use to achieve instant recognition by the public over time.

6.3.7 School Programs

Educating children about principles of fire and fire management can help to reinforce information provided to adults. Family discussions may encourage use of the FireSmart Home Owners Manual for site appraisals and clean-up work around the property.

Forestry programs are offered to both elementary and secondary students in School District #28 and are prominent during National Forestry Week. As well, Fire Prevention Week in October could include wildfire issues along with household fire safety.

6.3.8 Information Distribution

Public awareness about fire hazards can be increased through regularly scheduled publications and events. Two examples are the Cariboo Regional District's newsletter, *Upfront*, which is sent to all residents in the regional district, and the City of Quesnel's The *Q City News*, which is mass-mailed to all city residents. Additionally, presentations to the Cariboo Regional District town hall meetings, as well as elementary and secondary schools, could be made to inform audiences about fire risks and hazards. Presentations about the community wildfire protection plan should involve interested committee members to serve as technical specialists and to establish important links between their organization and the audience.

Communications should be a two-way process between the plan's committee and the public. Therefore, a mechanism is required for public input and feedback on all information and educational efforts to encourage public support for reducing fire risk and fire hazard as much as possible. This is easily provided on the website (6.4) and by ensuring that Open House events and other public gatherings for the purposes of the plan schedule feedback time to receptive committee representatives.

Recommendation #20

Develop and implement a public communications plan that covers the impacts of fire and how to address them, based on the methods described in the Quesnel and Area Community Wildfire Protection Plan.

6.4 Website

Websites are an important way to convey information. A website deserves special recognition in this plan because of its ability to communicate relatively inexpensively with a wide audience, from local to global. The Quesnel and Area Community Wildfire Protection Plan committee will provide electronic access to its work and activities, first through the Cariboo Regional District and City of Quesnel websites, and possibly later through its own website. The purpose of using a website is to increase awareness of the committee's work and how it helps the local community reduce its vulnerability to wildfire.

The Cariboo Regional District, City of Quesnel and others should design similar, consistent notation on their websites using a unified approach. Hotlinks will be installed to maximize user exposure on either website to the committee's work and the community wildfire protection plan.

Recommendation #21

Develop a Quesnel and Area Community Wildfire Protection Plan website (either a separate domain or through a link) for posting the plan, committee meeting summaries, the fire hazard map and all other relevant information.

6.5 Media Contact

Media contact is an important way to improve public awareness. Local media representatives have shown their interest in the Quesnel and Area Community Wildfire Protection Plan Committee by attending meetings and reporting on the committee's progress in local newspapers and by radio. This interest will be cultivated and encouraged, as the committee's best way to reach the public is through frequent and regular media contact. The committee needs to involve the media to successfully increase public awareness.

Through the development of this plan, meeting summaries for the committee were posted on the Cariboo Regional District and City of Quesnel websites. Notices of committee events will be posted in "Community Events" on radio and in the newspapers.

Media reports about the plan could include features similar to those for Crimestoppers, and a fire hazard report as is done for air quality. Reports could end with a FireSmart tip. The Ministry of Forests and Range employs a summer media co-op student who may be able to assist.

Recommendation #22

Develop a media plan for the Quesnel and Area Community Wildfire Protection Plan Committee that encourages media reporting about reducing fire risk and fire hazard.

6.6 Site Hazard Assessments

Fire prevention specialists from local communities will help residents in the plan area interpret the FireSmart Homeowners Manual and conduct their own Home and Site Hazard Assessment from pages 9–10 (British Columbia Forest Service et al.). Interested homeowners can respond to contact information for a fire hazard assessment. Community groups may wish to organize a Home and Site Hazard Assessment for a single residence in a community to which other residents could be invited. The specialist will help with a checklist of measures to take, but will avoid helping to develop a fire hazard reduction plan for a specific property.

There should be enough qualified individuals to respond to public requests, the program should be offered at the best time of year for both specialists and homeowners to maximize participation, and the assessments should be widely publicized.

Recommendaion #23

Based on requests from community groups, offer information on site hazard assessments by experienced specialists, and provide recommendations on managing forest fuel debris.

7. Implementation

7.1 Quesnel & Area Community Wildfire Protection Plan Committee

Representatives from the seven sub-units and others will meet to ensure the Quesnel and Area Community Wildfire Protection Plan is kept alive and implemented. Multi-agency meetings of identified individuals from the Cariboo Regional District, City of Quesnel, Ministry of Forests and Range, fire departments, forest industry, Red Bluff Indian Band and the public will ensure the stewardship of the plan's future development. City staff will organize regular quarterly meetings of this committee to identify how an operational plan is developed, key projects to initiate, what needs to be updated in the plan, and to set priorities for its implementation. A contact person shall be identified to support local actions in each sub-unit.

Recommendation #24

The entire Quesnel and Area Community Wildfire Protection Plan committee should meet at least once annually to present and prepare an annual report.

7.2 Sub-Units

Implementation of this plan required that the Quesnel and Area Community Wildfire Protection Plan area be subdivided into smaller units to address issues on a more localized scale (Figure 3). The plan's sub-units are based on the boundaries of the volunteer fire departments, with small additional areas added in to include outlying residences or to smooth out the boundary for efficiency.

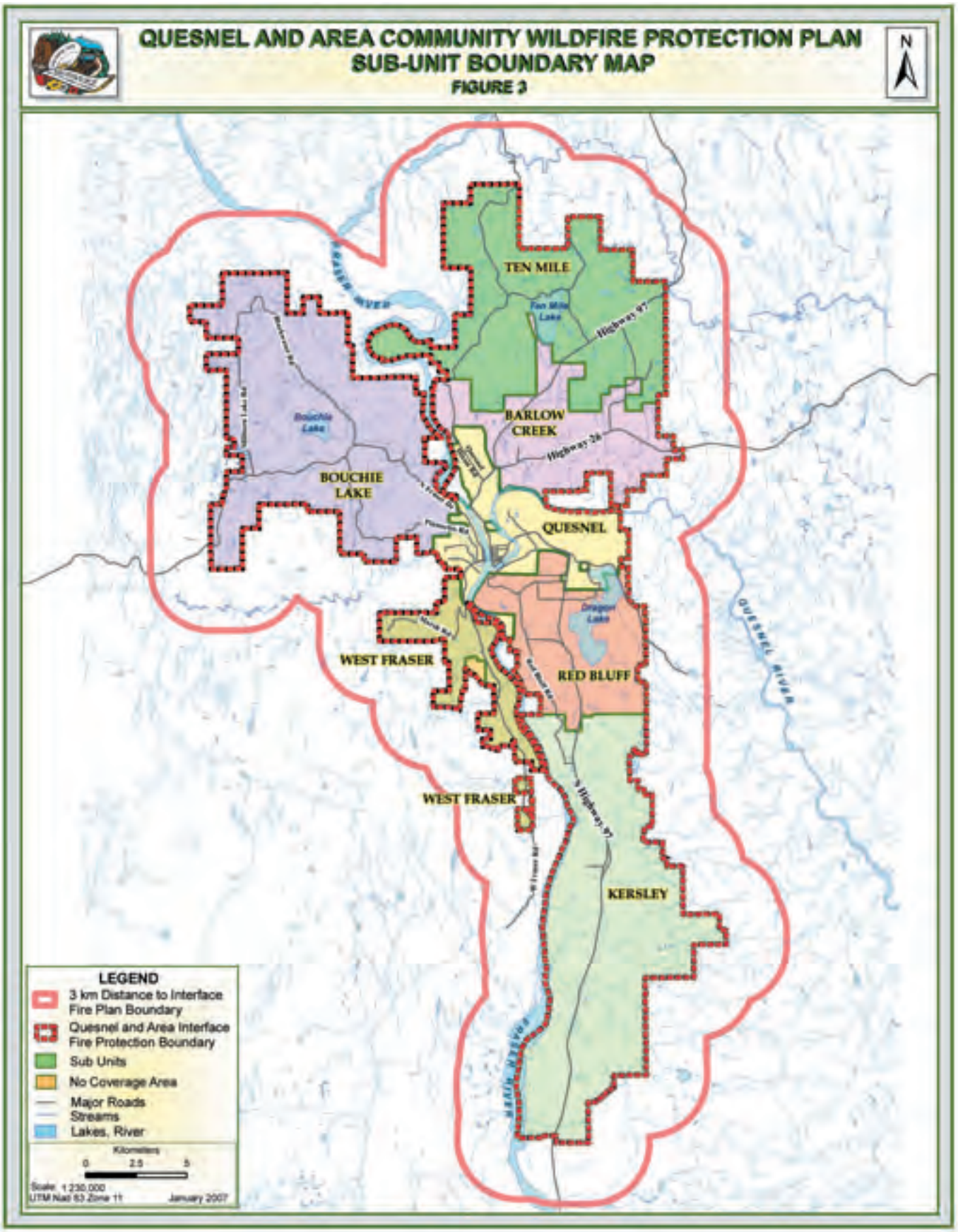

Figure 3. Sub-Units defined for the Quesnel and Area Community Wildfire Protection Plan.

8. Summary of General Recommendations

This plan lists a total of 24 General Recommendations for the entire plan area, which are listed below.

No.	*Topic*	*Recommendation*
1	FireSmart	Implement the FireSmart Homeowners Manual and use it as a "best practice."
2	Tree removal	Develop and distribute a procedure that enables and encourages landowners to remove both merchantable and non-merchantable trees and forest fuels from private property and adjacent Crown lands.
3	Local governments—planning	Local governments should: • Adopt FireSmart standards; • Prepare a Development Permit policy within the Official Community Plan; and • Strengthen current bylaws and resolutions.
4		In the planning, development and approval of new subdivisions, the Approving Officer should ensure that planners and developers: • Apply FireSmart standards; • Provide access for new subdivisions and cul-de-sacs in accordance with FireSmart or other recognized standards; and • Identify and develop new water sources.
5	Fire protection services	Clarify the current fire protection services available within the plan area, and recommend ways to expand and improve such services where practical and feasible.
6	Landfill sites	Manage the fire hazard around public and private landfill sites.
7	Incentives	Investigate options for reducing the fire hazard, including insurance incentives for communities that meet FireSmart standards and assistance from local governments.
8	Mapping	Identify the data custodians responsible for the pertinent data layers for the Quesnel and Area Community Wildfire Protection Plan. Document the data standards and update procedures to ensure regular maintenance of the information after all hazard management activities.
9	Vehicle access	Road authorities, land managers and land owners should work together to develop, improve and maintain access throughout the plan area to reach potential fires and water sources
10	Forest fuel reduction	Develop a plan to reduce or manage fuels on an area-specific basis, as described in the plan text. Ensure that all forest fuel reduction activities: • Include consultation with agencies or groups responsible for managing the land use values identified in this plan; and • Incorporate proper disposal methods.
11		Identify and access new and existing funding sources for communities, forest licensees, wood lot licensees and others to reduce forest fuels on key Crown and private lands, and ensure this information is publicly circulated.
12	Debris disposal	Where open burning is necessary, promote its safe and efficient utilization in compliance with the *Wildfire Act* and Regulation, the Open Burning Smoke Control Regulation and local bylaws. Use the recommendations of the Airshed Management Plan regarding smoke emission as well as the Environment Canada-generated venting index and weather information to regu late where and when burning is permitted. Continue to seek out effective alternatives to open burning, such as recycling, composting and the use of low-emission burners.
13	Water sources	Identify and map all water sources and their access to maximize water availability for fire fighting throughout the plan area.
14	Range and cattle	Animal evacuation plans should be developed with the rancher and the cattle owner (if not the rancher) and based on the animals' location during the grazing season, then shared with the local fire department.

No.	Topic	Recommendation
15	Invasive plants	Consult the available mapping of invasive plants by the Cariboo Regional District before undertaking any fire hazard reduction activities, to prevent the spread of invasive plants during the implementation of this plan.
16	Species at risk	Ensure that forest fuel reduction activities retain habitat values for provincially listed endangered and threatened species.
17	Utility companies	Assess the critical factors provided by the utilities within the plan area and: • Prioritize key protection efforts for the most important and vulnerable sites; • Investigate unique services and available backup; • and maintain copies of current protection plans developed by utility companies and organizations in a central location for reference; • Develop linked action plans to minimize risk; and • Ensure debris disposal techniques are in accordance with the plan.
18	Public support	Share fire hazard information with the public in a variety of ways that increase general public awareness with the entire population of the plan area, or addresses specific audiences, such as neighbourhood groups.
19	Demonstration projects	Establish forest fuel reduction pilot projects and demonstration areas on highly visible, accessible sites.
20	Communications plan	Develop and implement a public communications plan that covers the impacts of fire and how to address them, based on the methods described in the Quesnel and Area Community Wildfire Protection Plan.
21	Website	Develop a Quesnel and Area Community Wildfire Protection Plan website (either a separate domain or through a link) for posting the plan, committee meeting summaries, the fire hazard map and all other relevant information.
22	Media contact	Develop a media plan for the Quesnel and Area Community Wildfire Protection Plan Committee that encourages media reporting about reducing fire risk and fire hazard.
23	Site hazard assessments	Based on requests from community groups, offer information on site hazard assessments by experienced specialists, and provide recommendations on managing forest fuel debris.
24	Implementation committee	The entire Quesnel and Area Community Wildfire Protection Plan committee should meet at least once annually to present and prepare an annual report.

9. References

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10. Appendix A. Participants

Participants in the planning process for the Quesnel and Area Community Wildfire Protection Plan included:

- Nate Bello, City of Quesnel
- Vince Berlinguette, Kersley Volunteer Fire Department
- Tony Bensted, Quesnel Woodlot Association
- Denise Bollinger, Ministry of Transportation
- Jim Braem, Bouchie Lake Volunteer Fire Department
- Rick Brundrige, Cariboo Regional District
- Wayne Charlton, Kersley Community
- Roy Cruikshank, Ten Mile Volunteer Fire Department
- Doug Drescher, Spectra Energy (formerly Duke Energy)
- Mel Dunleavey, Mustang Wildfire Services
- Chris Elden, Resident
- Ken Falloon, Cariboo Regional District
- Clare Garvin, Quesnel Cattlemens Association
- Mary Glassford, Cariboo Regional District
- Ron Paull, City of Quesnel
- Gerry Grant, Ministry of Forests and Range
- Connie Haeussler, Ministry of Environment
- George Henderson, CFFM The Max
- Harlene Hunt, Quesnel Airport
- Adolph Jede, Baker Creek Enhancement Society
- Rhonda Kariz, BC Hydro
- Angie Kollner, Parkland Community Association and Moose Heights
- Brigitte Kollner, Parkland Community Association and Moose Heights
- Art Knauf, Ministry of Forests and Range

- Charlotte Kurta, Ministry of Environment
- Ken Kvist, Ministry of Environment
- Steve Levitt, Cariboo Fire Centre, Quesnel zone
- Andrea Lindsay, Northern Health Authority
- Tom Maxwell, Barlow Creek Fire Department
- Barry McLennan, Kersley Volunteer Fire Department
- Dora McMillan, Environmental Committee and Quesnel Air Quality Roundtable
- Phil Megyesi, West Fraser Fire Department
- Shawn Meisner, Tolko Industries Ltd.
- Brad Moores, Ministry of Transportation
- Jeff Norburn, City of Quesnel
- Coralee Oakes, City of Quesnel
- Brian Pedersen, Quesnel Cattlemens Association
- Michael Pelchat, Ministry of Forests and Range
- Ric Raynor, Quesnel Fire Department
- Gerald Schut, Provincial Emergency Program and Search and Rescue
- Brad Shauer, Spectra Energy (formerly Duke Energy)
- Mary Sjostrom, City of Quesnel
- Geronimo Squinas, Red Bluff Indian Band
- Victor Stobbe, Cariboo Ski Touring Club
- Bert Sturt, Ten Mile Volunteer Fire Department
- Sushil Thapar, City of Quesnel
- Tom Turner, West Fraser Mills Ltd.
- Len van Aalst, Emergency Social Services
- Michael Verschoor, BC Transmission Corporation
- Barb Watson, BC Timber Sales
- Wes Wiebe, Ministry of Transportation
- Ronda Wilkins, Cariboo Regional District
- Darren Wilkinson, Cariboo Fire Centre
- Marguerite Yarmie, Barlow Creek Community Hall

11. Appendix B. Glossary

The following terms are defined below as used in the Quesnel and Area Community Wildfire Protection Plan.

Core Area

The geographic area addressed by the Quesnel and Area Community Wildfire Protection Plan, which includes the City of Quesnel and the surrounding volunteer fire department areas, as well as some additional area that ties in outlying residences and important features.

Fire Hazard

The potential impacts of a fire based on fire behaviour and the conditions contributing to it.

Fire Risk

The likelihood of a fire starting, as determined by the presence and activities of causative agents.

Forest Fuels

Trees, ground vegetation and combustible material that affect fire behaviour.

General Recommendations
Recommended actions for the entire geographic area covered by the Quesnel and Area Community Wildfire Protection Plan.

Lead Agent
The expected instigator or catalyst (though not necessarily the funder) for a Sub-Unit Action.

Management Area
The area of influence surrounding the core area in a 3-km-wide band.

Other Agents
Supporting agents to the lead agent for a Sub-Unit Action.

Plan Area
The total geographic area for the Quesnel and Area Community Wildfire Protection Plan, consisting of the core area and management area.

Relative Hazard
A comprehensive estimate of fire hazard for each sub-unit, for comparing fire hazard between subunits, based on: density of improvements, risk of ignition, risk to values, and accessibility of ground-based emergency response.

Sub-Units
One of the seven sub-areas within the core area of the Quesnel and Area Community Wildfire Protection Plan, roughly defined by the geographic boundaries of the respective volunteer fire department.

Sub-Unit Actions
Recommended actions that address fire hazard on a localized scale for the sub-unit.

Wildland Urban Interface Zone
The area that connects the forest and urban/rural community development, and which includes wildland or forested areas where wildfires can occur, and where developments, such as homes and structures, also exist.

12. Appendix C. Sub-Unit Summaries and Actions

Each of the seven sub-units begins with a description of the area followed by a completed Wildland Urban Interface Fire Hazard Assessment (Ministry of Forests and Range). The assessment enables assigning a hazard class to the defined area of nil, low, moderate, high and extreme, based on the total score. The risk ratings for the seven sub-units are:

Sub-Unit	*Interface Community Fire Hazard Risk Rating*	*Hazard Class*
Barlow Creek	71	Moderate
Bouchie Lake	62	Moderate
City of Quesnel	39	Low
Kersley	66	Moderate
Red Bluff	50	Low
Ten Mile	67	Moderate
West Fraser	60	Moderate

The relative hazard and risk rating were used to recommend specific actions for each sub-unit. Sub-Unit Actions are prioritized in decreasing order of importance and consider the recommendation's feasibility in addition to its expected effect in reducing the fire hazard.

All sub-units include the following four high-priority recommendations for sub-unit actions, which are also individual General Recommendations for the entire plan area (where more information can be found in the plan):

Sub-Unit Action	Lead Agent	Other Agents	Corresponding Recommendation
Implement the FireSmart program with local residents.	Fire dept.	CRD, community assoc.	1
Review road and bridge access and explore alternate routes.	Developer	MoT	9
Provide support to the local volunteer fire department.	CRD		5
Review and identify sites for pilot projects.	Community assoc.	CRD, MoFR	19

The Lead Agent is expected to be the instigator or catalyst for the action (though not necessarily the funder). Other Agents are listed to show supporting agents to the lead agent. The following acronyms are used in the sub-unit actions:

CRD =	Cariboo Regional District
Quesnel =	City of Quesnel
MoE =	Ministry of Environment
MoFR =	Ministry of Forests and Range
MoT =	Ministry of Transportation

12.1 Barlow Creek

The Barlow Creek sub-unit is located towards the northeast end of the plan area, and includes the Highway 97 and Highway 26 corridors. This sub-unit has flat and rolling terrain interspersed with two deep gullies, and a general south slope leading to the Quesnel River. Forests are mainly spruce and Douglas-fir. Infrastructure includes the powerline running roughly north–south, the hazard beacon for aeronautical navigation located off Highway 26 southeast of the airport, the Spectra Energy (formerly Duke Energy) transmission metering station, the CN Rail tracks and the railroad trestle on Matthews Road.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Identify water sources throughout the sub-unit.	Fire department	MoE Water Stewardship	
2	Examine the hilly terrain to the Quesnel River to determine access.	Fire dept., CRD	MoFR, MoT	
3	Ensure that landfills and log storage sites have adequate fire protection measures.	Kopetski	Canfor, West Fraser Mills, MoE	
4	Manage the forest fuels at the landfill sites.	Kopetski, Purmal	MoE	
5	Develop a fire response plan for the corridor along the rail line.	CN Rail	Fire dept.	

12.2 Bouchie Lake

Bouchie Lake is the most westerly sub-unit in the plan area. Terrain is generally rolling and forests are mainly coniferous. There are several subdivisions throughout the sub-unit, and Bouchie and Milburn lakes both have lakeshore residential development. The general development pattern includes larger lots with less separation between houses and trees than in subdivisions. Mount Milburn lies to the west of the sub-unit boundary and is an important site for communications.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Develop turnarounds at road ends to improve access for fire trucks.	Fire dept., CRD	MoT	
2	Identify alternate access/egress for vehicles needing to cross the wooden bridges on Barker Road and Norwood Road across Bouchie Creek, or provide an alternative to protect the bridges.	CRD	MoT, private landowners	

12.3 City of Quesnel

The City of Quesnel lies at the centre of the plan area at the confluence of the Fraser and Quesnel rivers with bridges connecting the south, north and west sides of the city. Along with an extensive residential area, Quesnel has an industrial area at Two Mile Flat with log storage yards and 17 sawmills, a medium density fiberboard plant and two pulp mills that lie on both sides of the Quesnel River. The city has a hospital, police station, firehall, ambulance station, CN Rail yard, the Spectra Energy (formerly Duke Energy) pipeline (which runs through the city from the Quesnel River through to Highway 97 at Valhalla

Road) along with a metering station, and BC Hydro's main power distribution station. There are three British Columbia Transmission Corporation substations, and an airport at the north end of the city.

The city landfill is surrounded by beetle-killed timber, with no water sources and poor access. Some areas of this sub-unit have steep slopes and again, no water sources and poor access. The east side of the city in the Southills area has biggest interface threat from fire. Water sources include the Fraser and Quesnel rivers. The log storage areas are very large, and many have limited hydrant water supply.

A fire within this sub-unit would create significant venting issues around air quality and visibility for air traffic because of the bowl-like topography in which the city is located.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Manage the fuel hazard around the city landfill.	Quesnel		
2	Review current fire protection plans for the log yard area and identify recommendations for future needs.	Tolko, Canfor, West Fraser Mills	Quesnel	
3	Develop a fire response plan for the corridor along the rail line.	CN Rail	Fire dept.	

12.4 Kersley

Kersley is the most southern sub-unit of the plan area. The topography is rolling with steep gullies leading west to the Fraser River. The sub-unit includes the Highway 97 corridor, the Spectra Energy pipeline, BC Transmission Lines and compressor station, and CN Rail, all of which run roughly parallel in a north–south direction. Much of the sub-unit is agricultural. Industrial development includes the Pinnacle Pellets plant.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Develop a fire response plan for the corridor along the rail line.	CN Rail	Fire dept.	
2	Improve water sources where currently unavailable.	Fire dept., Kersley community assoc.	MOE Water Stewardship, BC Parks	
3	Identify and improve road access to the flat area along the Fraser River for fire response.	Fire dept., CRD	MoT, MoFR	

12.5 Red Bluff

The Red Bluff sub-unit is located immediately south of the City of Quesnel and has mainly flat or rolling terrain. Dragon Lake lies on the eastern edge and is the largest lake within the plan's geographic area. Small parcels of forest land consist of mixed coniferous and deciduous stands. The Red Bluff reserve is the only reserve within the plan area, and it consists of four units south of the City of Quesnel. The Red Bluff sub-unit is well-roaded and has a water reservoir on the Red Bluff Indian Reserve. Subdivisions have many dead-end roads that would limit egress during a fire. CN Rail lines and the BC Transmission Line run through this sub-unit, and there is a Spectra Energy metering station as well as a Nav Canada non-directional beacon for air navigation located on Maple Drive.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Identify water sources and ensure adequate water levels for firefighting.	Fire dept.	Red Bluff Indian Band	
2	Develop a fire response plan for the corridor along the rail line.	CN Rail	Fire dept.	

12.6 Ten Mile

The Ten Mile sub-unit, at the northern end of the plan area, is bisected by the Highway 97 corridor, the Spectra Energy pipeline, BC Transmission Corporation lines, and CN Rail, all in a roughly southwest-to-northeast direction. The terrain is generally rolling or hilly, with some localized steep gullies. The sub-unit lies to the east of the confluence of the Fraser and Cottonwood rivers. Most of the area is a mix of fields, forests and subdivisions. Ten Mile Lake Provincial Park is situated roughly in the centre of the sub-unit. As in much of the plan area, there is limited cell phone coverage; the Rogers cell tower is just north of the plan's boundary. There is a hazard beacon for aeronautical navigation located at the south end of this sub-unit, adjacent to the east side of the airport.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Improve access, where required, by road widening and addressing dead-end sideroads.	MoT		
2	Identify water sources and ensure adequate water levels for firefighting.	CRD	MOE Water Stewardship	
3	Develop a fire response plan for the corridor along the rail line.	CN Rail	Fire dept.	

12.7 West Fraser

The West Fraser sub-unit is located along the southwest edge of the plan area. Terrain is flat on the plateau and then sloped to the Fraser River to the east. Forest fuels are mixed. The sub-unit has a mix of fields and forests and large rural properties that are relatively linear and dispersed. Water sources for firefighting are limited or need access developed (all water from city hydrants). Many of the roads in the sub-unit do not connect and end in a dead end.

In addition to the plan's 24 General Recommendations, the following actions apply specifically to this sub-unit:

Priority	Barlow Creek Sub-Unit Specific Actions	Lead Agent	Other Agents	Implementation Date
1	Work with landowners to relocate and upgrade potential road connections for fire suppression trucks through private property.	CRD, Fire dept.	Landowner, MoE	
2	Identify and develop water sources for firefighting.		MoE Water Stewardship	

13. Appendix D. Weather Data for the Quesnel Area

Monthly weather data for the fire season months of April to October are provided below for 1994 to 2004. Table 1 covers mean monthly temperature and Table 2 provides monthly total precipitation. All data were recorded from the weather station at the Quesnel Airport and extracted from the Environment Canada historical climate records (www.climate.weatheroffice.ec.gc.ca). The wind rose shown in Figure 4 summarizes wind direction and velocity based on weather station data from the Quesnel Airport.

Table 1. Monthly mean temperature (°C) for Quesnel during the months of the fire season (1994–2004)

Year	April	May	June	July	August	Sept.	October	Average
1994	8.1	11.6	14.8	17.5	17.0	13.5	5.3	12.5
1995	6.1	11.7	15.6	17.0	14.1	13.2	5.7	11.9
1996	6.6	8.6	13.6	16.1	15.7	10.5	4.5	10.8
1997	5.7	12.0	14.1	16.7	16.7	12.8	5.0	12.0
1998	6.5	14.6	15.9	19.3	17.2	13.2	6.7	13.3
1999	6.6	9.3	13.5	15.6	16.7	10.8	5.9	11.2
2000	6.2	9.6	13.7	16.6	15.1	10.7	5.8	10.2
2001	5.8	10.3	12.8	16.1	16.7	11.9	4.7	11.2
2002	4.2	9.2	15.3	16.3	15.4	unavail.	4.2	10.8
2003	6.6	9.5	15.2	16.9	16.6	11.4	7.0	11.9
2004	7.2	10.6	16.1	17.7	17.5	10.1	5.9	12.2

Table 2. Monthly total precipitation (mm) for Quesnel during the months of the fire season (1994–2004)

Year	April	May	June	July	August	Sept.	October	Average
1994	19.4	35.8	94.8	46.9	46.4	40.8	36.4	45.8
1995	38.1	17.7	52.4	102.0	76.9	10.2	71.5	52.7
1996	31.6	44.6	75.0	59.8	71.2	72.4	88.1	63.2
1997	35.4	31.8	44.5	120.5	28.6	68.8	62.5	56.0
1998	35.7	19.9	52.9	68.7	16.3	16.5	78.9	41.3
1999	20.2	65.4	106.2	65.0	45.7	61.1	20.3	54.8
2000	15.0	53.0	104.9	100.8	59.1	29.3	35.6	58.3
2001	18.8	28.4	72.9	107.7	62.2	59.0	38.1	55.3
2002	23.7	67.2	62.0	46.1	28.1	unavail.	42.0	44.9
2003	39.1	16.8	38.5	53.2	27.5	79.9	79.7	47.8
2004	23.5	69.2	85.4	51.6	59.9	100.8	36.8	61.0

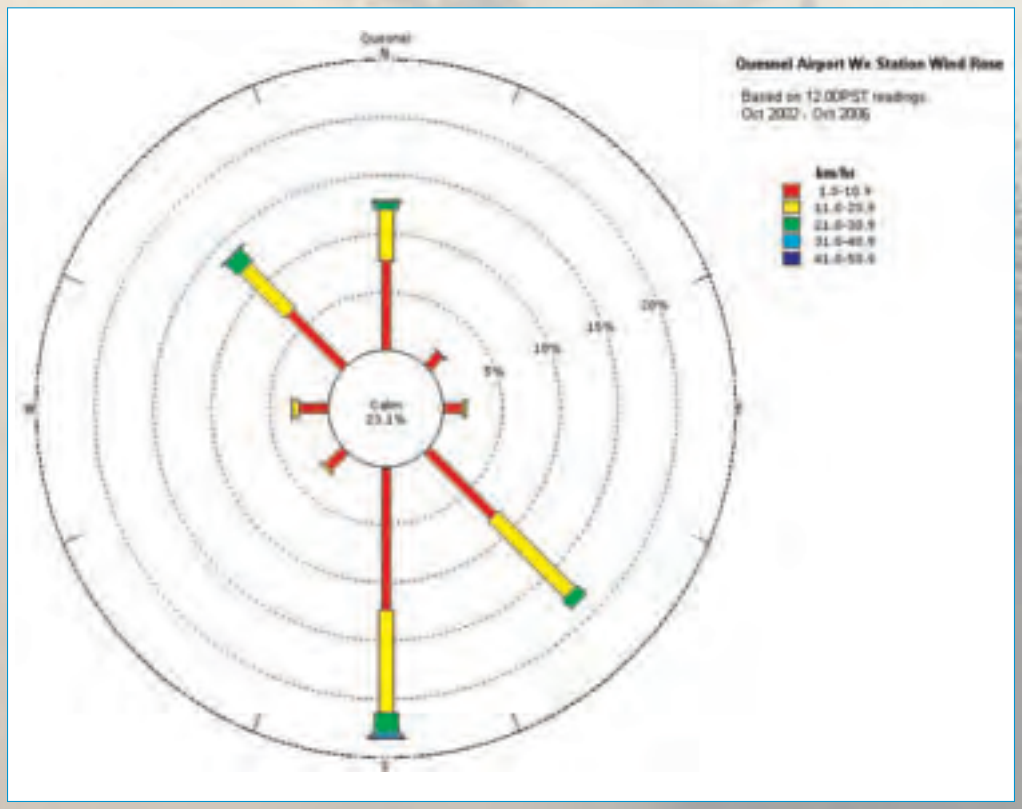

Figure 4. Wind rose for the Quesnel Airport weather station.

The wind rose displays the orientation of the cardinal directions (north, south, east and west) of the winds for the Quesnel Airport based on long-term weather data. The predominance of wind speed ranges is shown by the colours on the axes of the rose. The predominant wind for this location is from the south (approximately 23 percent of the time). For an equal amount of time, the wind is calm.

14. Appendix E. Development Permit Areas

As a land use planning tool, the establishment of Development Permit Areas for Interface Fire Hazards can protect and mitigate values from wildfire in the interface area. Through the Community Charter and the *Local Government Act*, Development Permit Areas allow the authorization by local government of a specified activity with special circumstances deserving particular attention. For example, they would specify requirements for future development to reduce the fire hazard. Establishing Development Permit Areas leads to specific policies, such as the protection of farming or the natural environment, or the form and character of commercial, industrial and high-density residential development.

Pursuant to the provisions in the Community Charter and the *Local Government Act*, both the City of Quesnel and the Cariboo Regional District can establish Development Permit Areas within their Official Community Plans. The Cariboo Regional District is currently producing an Official Community Plan for the Quesnel fringe area, which encompasses much of the area of this community wildfire protection plan. Additionally, the City of Quesnel's Official Community Plan is in the final stages of amendments. The Official Community Plans may include Development Permit Areas for "the protection of development from hazardous conditions." In particular, the Act additionally outlines that a development permit may, in relation to wildfire hazard:

- include requirements respecting the character of the development, including landscaping, and the siting, form, exterior design and finish of building and other structures; and
- establish restrictions on the type and placement of trees and other vegetation in proximity to the development.

Development Permit Areas are recommended for some Sub Unit Areas and have the additional potential for areas of dense development (areas pre-designated in the Official Community Plans) and developed areas with available building sites remaining. Development permits will require a number of key elements requiring detailed attention during the implementation stage such as:

- A unified approach undertaken by the City of Quesnel and the Cariboo Regional District to make this policy effective;
- Enforcement issues and liability concerns towards local governments;
- Defined locations of all existing and proposed buildings and structures;
- Access routes for all proposed subdivisions in regards to fire safety;
- The extent and nature of existing and proposed landscaping; and
- The exterior materials (siding and roof) of existing and proposed buildings.

Additionally, subdivisions can be designed to respect hazard rating with multiple access routes provided for emergency evacuation. New subdivision roads can also provide linkages to abutting subdivisions. At present, the City of Quesnel has subdivision approval authority, while the Cariboo Regional District's subdivision approving authority is the Ministry of Transportation. Should a parcel of land require rezoning, either government can request a subdivision plan at the time of application, and thereby assess access and design as part of the review process.

15. Appendix F. Map Information

The following information is available on the Interface Fire Plan map, prepared by City of Quesnel staff on behalf of the Quesnel and Area Community Wildfire Protection Plan Committee.

Information	*Description*
3 km buffer to plan area boundary	Boundary of management zone
Aerial photographs	Orthophotos
Agricultural Land Reserve	Boundary
BC Hydro right-of-way	Boundary
Building density	
City of Quesnel	Boundary
Communication towers and access routes	Point of infrastructure feature – Milburn and Dragon Mtns, key bridges
CRD lots	Subdivisions within Cariboo Regional District with property lines
District lots	Line
Fire hazard class	Area of • Extreme • Very High • High • Moderate • Low
First Nation reserves	Boundary
Gas and oil pipeline right-of-way	Boundary
Gas transmission facility	Point
Lakes	Boundary
Land status	Classified by • No Crown federal present • Provincial Crown land • Non-Crown/private
Logging roads	Unclassified
Mountain bike trails	Line
Place names	Text
Rivers	Boundary
Road names	Text
Roads	Classified by gravel and paved
Streams	Line
Sub-units	Boundary
Topographic contours	Contours shown at 10-m intervals
Water reservoirs	Boundary
Quesnel and Area Community Wildfire Protection Plan	Boundary of core area
Woodlot licences	Boundary

16. Appendix G. Electronic Presentation of Plan Maps

Some copies of this plan include a CD in the inside back cover. The CD includes the three maps presented as figures in this plan:

Figure 1. Geographic area addressed by the Quesnel and Area Community Wildfire Protection Plan.
Figure 2. Spotting distance map.
Figure 3. Sub-Units used for the Quesnel and Area Community Wildfire Protection Plan.

The CD also provides additional information, including maps of the Quesnel Airshed, water sources, contours and other references, based on the list provided in Appendix F of the interface map information. The maps are available in 8.5” x 11” format and full map size (36” x 48”).