VILLAGE OF NEW DENVER

COMMUNITY WILDFIRE PROTECTION PLAN

Considerations for Wildland Urban Interface Management in the Village of New Denver, British Columbia



PART 2

Submitted by:

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1.0 Village of New Denver

1.1 Study Area

The Village of New Denver is a rural community located on the eastern shore of Slocan Lake within the Selkirk Mountain range (refer to Figure 1). The Village sits at an elevation of approximately 569m. By highway, the Village is 47km west of Kaslo and 46 km southeast of Nakusp. The municipal boundary of the Village contains an area of 157 ha.

The total study area that makes up this plan includes the municipal boundary and a 2 km buffer that consists of map sheet numbers: 082F.093, 082F.094, 082K.003, and 082K.004. The total study area is 2475 ha. An ownership map of the study area is shown in Map 1.

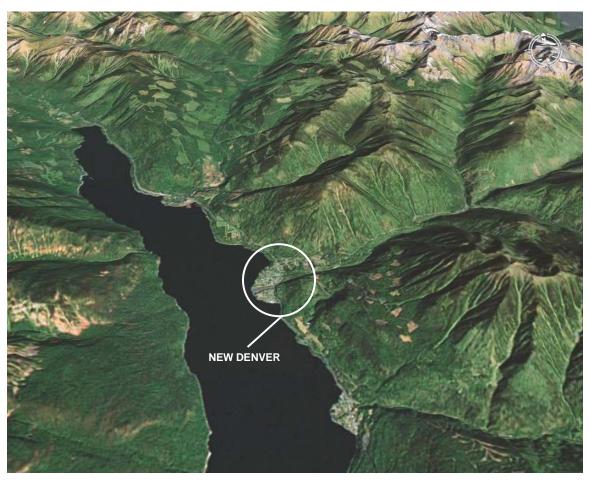


Figure 1. View of topographic relief of the Village of New Denver looking north (sourced from Google EarthTM, 2007).

1.1.1 Population

The 2006 Census reported that the Village of New Denver supported a population of 512 persons. This is a 4.8% decrease from the previous population of 538 recorded in 2001¹.

1.1.2 Economy

New Denver was established during the mining boom of the 1890's. However, by 1920 the mining boom was over. The logging and forestry industry has now replaced mining as the main industry. Other industries, such as retail trade, health and social services and tourism now contribute to the economy of the Village as well².

1.1.3 *Infrastructure*

The New Denver Volunteer Fire Department (Figure 2) and the Slocan Community Health Centre are critical to emergency response service in the community. The Fire Department provides the foundation for incident command and response during a large fire event and therefore must be prepared to deal with complex situations.

Emergency response is dependent on electrical and water service within the community. The Village has its own gravity fed municipal water system and has backup generators. Water for fire fighting is sourced from hydrants and two tanker trucks. Nearby rivers and lakes could also provide a source of water for fire fighting.

Electrical service to the community comes from a network of transmission infrastructure. A large fire has the potential to impact this service by causing a disruption in network distribution through direct or indirect means. For example, heat from the flames or fallen trees associated with a fire event may cause power outages. Consideration must be given to protecting this critical service and providing power back up at key facilities to ensure that the emergency response functions are reliable.

The key infrastructure discussed above was considered as part of the Wildfire Risk Management System. The results of this analysis indicate that consideration must be given to protection of the critical infrastructure identified above.

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http://www12.statcan.ca/english/census06/data/profiles/community/Details/Page.cfm?Lang=E&Geo1=CSD&Code1=5903 032&Geo2=PR&Code2=59&Data=Count&SearchText=New%20Denver&SearchType=Begins&SearchPR=01&B1=All&Cu stom=

http://www.newdenver.ca/heritage/heritage.php http://www.newdenver.ca/office/villagestats.pdf



Figure 2. New Denver fire hall.

1.2 Fuels

1.2.1 Fuel Type Summary

Table 1 summarizes the fuel types by area. A description of each fuel type is provided in Appendix 1. Map 2 shows the fuel types for the study area.

Table 1. Summary of fuel types based on the total study area

	C2	C3	C4	C5	C7	D1	M2	O1b	Non	Total
Area	3	422	226	227	53	9	212	68	1,253	2,473
%	< 1	17	9	9	2	<1	9	3	51	100

1.3 Historic Ignitions

The MOFR fire reporting system was used to compile a database of fires back to 1950 in the WRMS study area. Map 3 shows the ignition locations within the Village. The total number of fires by decade is as follows: 1950-59-1; 1960-69-2; 1970-79-3; 1980-89-1; 1990-1999-1. No fires were reported in the period 2000-2005. The most significant fire year in recent history was 1974 when 2 fires were reported in the study area.

Table 2 summarizes the fires that have occurred between 1950 and 2005 in the study area by size class and cause (lightning and human caused). The total number of fires during this period was 8, of which 75% were the result of human causes. The remaining 25% of fire ignitions were

lightning caused. All fires that burned between 1950 and 2005 were smaller than four hectares. The largest fire within the Village since 1950 occurred in 1994 and burned an area of 0.2 hectares.

Table 3 summarizes fire cause by decade. Through the time of record, human caused fires have far out-numbered those caused by lightning. On average, there have been 1.4 fires each decade (minimum 1 in the '50s, '80s and '90s and maximum 3 in the '70s). The majority of fires have been inconsequential in size.

Table 2. Fire history summary within the study area from 1950 - 2005.

Size Class (ha)	Total Number of Fires	% of Total	Lightning Caused	Human Caused
<4.0	8	100	2	6
4.0-10.0	-	-	-	
>10.0	-	-	-	
Total Fires	8	100	2	6

Table 3. Summary of fire cause within the study area.

Decade	Lightning	Direct Human ¹	Industrial ²	Total
1950-1959	-	1	-	1
1960-1969	0	2	0	2
1970-1979	1	2	0	3
1980-1989	0	1	0	1
1990-1999	1	0	0	1
2000-2005	0	0	0	0
Total Fires	2	6	0	8

¹ Campfire, smoker, incendiary, juvenile set, fire use

2.0 The Wildland Urban Interface

New Denver is surrounded by interface except where it borders Slocan Lake. There is a relatively constant and defined interface boundary between the developed area and the adjacent wildland. Map 4 shows areas within the community defined as interface.

² Equipment, railway

3.0 Community Risk Profile

Map 5 shows the results of the wildfire risk assessment for the Village of New Denver. The Village is defined as having low to moderate probability and high to extreme consequence of wildfire. Probability within the Village boundary is lower than outside the Village boundary primarily because of the area of non-fuel and deciduous fuel types in New Denver. However, the Village is surrounded by areas of extreme wildfire probability. This indicates that there is a high probability of a wildfire event occurring in the study area and that the values assessed for fire risk as part of this project are likely to be severely impacted by a fire in New Denver.

4.0 Action Plan

The Action Plan consists of the key elements of the Community Wildfire Protection Plan and provides recommendations addressing each element. Each of these elements is further explained in Part 3: Community Wildfire Protection Planning Background, which provides background information to support the Action Plan.

4.1 Communication and Education

4.1.1 Objectives

- To educate residents and businesses on actions they can take to reduce fire risk on private property.
- To establish a sense of homeowner responsibility for reducing fire hazards.
- To raise the awareness of elected officials as to the resources required and the risk that wildfire poses to communities.
- To make residents and businesses aware that their communities are interface communities and to educate them about the associated risks.
- To increase awareness of the limitation of municipal and provincial fire fighting resources to encourage proactive and self-reliant attitudes.
- To work diligently to reduce ignitions during periods of high fire danger.
- To develop a community education program in the next two years.
- To establish a FireSmart home pilot project in the next five years.
- To enhance the community's website to better communicate wildfire protection planning to the community in the next two years.
- To improve fire danger and evacuation signage in the next two years.

4.1.2 *Issues*

• The New Denver website does not currently provide any information regarding wildfire risk or property protection. It would be beneficial to add information on what individual homeowners can do to protect their homes as well as information on up-to-date fire danger and fire restrictions.

4.1.3 Recommendations

Recommendation 1: The Village should consider developing a communication plan to outline the purpose, methods and desired results of communication and education in the community. The plan should cover the principles of fire risk to the community, fire behaviour, spotting, structure protection and vegetation management. Educational information and communication tools need to be stakeholder specific. To establish effective communication within target groups, the plan should identify spokespersons who can best establish communication ties with target audiences and provide the educational information required.

Recommendation 2: The Village should investigate working with local developers to construct a FireSmart show home to be used as a tool to educate and communicate the principles of FireSmart to the public. The demonstration home would be built to FireSmart standards using recommended materials for interface communities. Additionally, vegetation adjacent to the home would be managed to guidelines outlined in the FireSmart program.

Recommendation 3: The standard for website information about fire should include an outline of community fire risks and proactive steps individual homeowners can take to make their homes safer within the community. Other information, such as fire danger and FireSmart principles, and a Home Hazard Assessment can also be maintained on the local website. A section should be included to provide information on campfire bans and wildfire hazard ratings to educate visitors and provide information to local residents.

Recommendation 4: The community should access local newspapers or community bulletins to deliver FireSmart educational materials and to communicate information on fire danger.

Recommendation 5: Signage consisting of current fire danger, campfire bans and general warnings regarding fire safety should be posted at all major entrances to the Village or surrounding Fire Protection Area and updated with current fire information as required.

Recommendation 6: The Village should consider working with other Central Kootenay municipalities, the Regional District of Central Kootenay and the MOFR to develop a regional approach to enhancing education and communication.

Recommendation 7: The Fire Department should work with the Slocan District Chamber of Commerce to educate the local business community, particularly businesses that depend on forest use (*i.e.*, tourism and recreation) on FireSmart preparation and planning. Public education programs should be enhanced by: 1) integrating a unit of "FireSmart" and wildfire safety into the local elementary school curriculum, promoting the principles of community wildfire protection at a young age in order to improve awareness over time. This unit could be part of a general emergency preparedness teaching program; 2) creating a "FireSmart" sticker program where Fire Department members attend residences and certify them as meeting "FireSmart" guidelines.

4.2 Structure Protection

4.2.1 Objectives

- To adopt a FireSmart approach to site and structure hazard assessment and structure protection.
- To develop policy tools which adopt FireSmart standards over the next five years.

4.2.2 Issues

- Currently there is no fire vulnerability standard for roofing material used in the Village. However, many homes are constructed with materials that are considered fire resistant. A home with wood siding is shown in Figure 3 and a home built with relatively fire resistant materials is shown in Figure 4.
- Unrated roofing materials contribute significantly to fire risk. In the future, as new homes are built, altering the building code or bylaws to further encourage the use of rated roofing materials may be of benefit.
- Combustible materials stored within 10 m of residences are considered a significant issue.
 Woodpiles or other flammable materials adjacent to the home provide fuel and ignitable surfaces for embers.



Figure 3. Example of home with wood siding.



Figure 4. A New Denver home built with relatively fire resistant materials.

4.2.3 Recommendations

Recommendation 8: Homes built immediately adjacent to the forest edge are often in direct contact with trees and forest vegetation. The community should consider incorporating building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface.

Recommendation 9: The community should investigate the policy tools available for reducing wildfire risk within the Village. These include voluntary fire risk reduction for landowners, bylaws for building materials and subdivision establishment, covenants for vegetation set-backs, delineation of Wildfire Development Permit areas, incentives such as exclusion from a fire protection tax, and education. Specifically, the community should investigate a process to create and/or review and revise existing bylaws to be consistent with the development of a FireSmart community. Consideration should be given to the creation of a Wildfire Bylaw that mandates sprinkler protection, provides for good access for emergency response, and specifies fuel management on both public and private property.

Recommendation 10: The Village should consider requiring roofing materials that are fire retardant with a Class A and Class B rating within new subdivisions and on new buildings. The community should consider obtaining legal advice regarding the implementation of building requirements that are more restrictive than the BC Building Code. While restrictions to rated roofing are not supported in the Code at this time, there are several communities which have undergone or are undergoing various processes (e.g., lobbying, legal opinion, declaration of hazard by Fire Chief) to enact roofing bylaws within their Wildfire Development Permit areas.

Recommendation 11: The Village should consider working with the Building Policy Branch to create a policy structure that would enable the municipality to better address wildland urban interface protection considerations for buildings.

Recommendation 12: Access constraints to residences should be addressed. Homeowners should be made aware of access constraints that may prevent the Fire Department from attending a wildland fire that could threaten their property.

Recommendation 13: Subdivision design plans should be reviewed by the Fire Department to ensure that suitable access routes exist, that hydrant accessibility is adequate where applicable, and that interface fire related issues are addressed.

4.3 Emergency Response

4.3.1 Objectives

- To develop an emergency response plan that enables effective evacuation, improves fire fighter suppression capability and maintains fire fighter safety.
- To improve access within isolated portions of the community over the next 10 years.
- To review the community's evacuation plan in the next 12 months.
- Over the next 12 months, to develop a contingency plan in the event that smoke requires evacuation of critical emergency service facilities.

4.3.2 *Issues*

- Evacuation of residents and access for emergency personnel is an important consideration given the amount of forest fuels in close proximity to many homes. Within the areas identified in Map 6 there is only one access and evacuation route available to motor vehicles and emergency responders. The situation could be further complicated by smoke and poor visibility, creating the necessity for traffic control in some locations. The Village should consider establishing secondary or alternate evacuation routes for these locations.
- In addition to the evacuation of residents, safety of fire fighting personnel is a major consideration. Map 6 emphasizes that under extreme fire conditions it may be difficult for the New Denver Volunteer Fire Department to access specific areas of the Village due to the potential for resources to be isolated or cut off. Defense of these locations would be secondary to safety considerations.

4.3.3 Recommendations

Recommendation 14: A formal communication structure should be established with the MOFR so that information regarding fires in the region is communicated in a timely manner to the communities and Fire Departments adjacent to active fires. This might be best achieved through joint cooperation with the Regional District of Central Kootenay, other Central Kootenay municipalities and the MOFR.

Recommendation 15: Consideration should be given to establishing a fire bylaw that defines the roles and authority of the Fire Department and regulates open burning.

Recommendation 16: Consideration should be given to developing a community evacuation plan. Appropriate evacuation routes should be mapped, considering Disaster Response Routes (DRR). Major evacuation routes should be signed and communicated to the public. The plan should identify loop roads and ensure access has sufficient width for two way traffic. In addition, alternative emergency responder access should be considered.

Recommendation 17: The Village should work towards improving access in areas of the community that are considered isolated and that have inadequately developed access for evacuation and fire control (for example, by opening dead end roads and connecting roads).

Recommendation 18: New subdivisions should be developed with access points that are suitable for evacuation and the movement of emergency response equipment. The number of access points and their capacity should be determined during subdivision design and be based on threshold densities of houses and vehicles within the subdivisions.

Recommendation 19: Where forested lands abut new subdivisions, consideration should be given to requiring roadways to be placed adjacent to those lands. If forested lands surround the subdivision, ring roads should be part of the subdivision design. These roads both improve access to the interface for emergency vehicles and provide a fuel break between the wildland and the subdivision.

Recommendation 20: During a large wildfire it is possible that critical infrastructure within the Village could be severely impacted by smoke. It is recommended that contingency plans be developed in the event that smoke causes evacuation of the community's incident command centre. The Village should co-operate with provincial and regional governments to identify alternate incident command locations and a mobile facility in the event that the community is evacuated.

Recommendation 21: The Village should consider conducting a review of critical water infrastructure to determine whether water flow and pressure will be adequate in an interface fire emergency. The review should consider water supply, water delivery volumes/pressure, pumping capacity and vulnerability of reservoirs. In addition, the community should review fuel storage capacity to ensure that there is adequate fuel to sustain the community for several days in the event that a wildfire isolates the community.

Recommendation 22: Given the values at risk identified in this plan, it is recommended that, during periods of high and extreme fire danger (danger class IV and V), the community work with adjacent municipalities and the Ministry of Forests and Range to maintain a local helicopter with a bucket on standby within 30 minutes of each community.

4.4 Training/Equipment

4.4.1 Objectives

- To ensure adequate and consistent training for fire fighter personnel and to build fire fighter experience.
- To continue to train all Fire Department personnel to the provincial standard (S100 and S215) on an annual basis.

4.4.2 Issues

- The New Denver Volunteer Fire Department has received training to Ministry of Forests and Range (MOFR) standards. However, communication with the MOFR could be further developed in terms of training and support.
- The Fire Department currently has wildland fire fighting equipment including a Compressed Air Foam System truck and appropriate PPE, hoses and pumps. However, the department has no radios and is relatively isolated from other communities that may be able to provide support.

4.4.3 Recommendations

Recommendation 23: The following training should be maintained/considered: 1) The S100 course training should be continued on an annual basis; 2) Municipal Parks outside staff should be trained in the S100 course; 3) A review of the S215 course instruction should be given on a yearly basis; 4) The S215 course instruction should be given to new career staff and Paid On-Call Officers on an ongoing basis; and, 5) Incident Command System training should be given to all career and Paid On-Call Officers.

Recommendation 24: The Fire Department should meet with the MOFR prior to the fire season to review the incident command system structure in the event of a major wildland fire. As it may be most effective for this to occur at a regional level, the community and Fire Department should work in conjunction with Regional District staff to establish clear command structures and lines of communication with MOFR to ensure efficient operations during wildfire events. This should include designated radio channels and operating procedures.

Recommendation 25: The community should consider reviewing its existing inventory of interface fire fighting equipment to ensure that items such as large volume fire hoses, portable pumps and fire fighter personal protection equipment (PPE) are adequate to resource the interface area. Fire Department personnel should have correct personal protective equipment and wildland fire fighting tools. Hoses, pumps and other equipment should be compatible with MOFR wildland fire fighting equipment.

Recommendation 26: Given the wildfire risk profile of the Village, an emergency sprinkler kit capable of protecting 30 to 50 homes should be purchased and maintained in the community. Fire rescue personnel, or a designate of the department, should be trained to mobilize and set up the equipment efficiently and effectively during a fire event.

Recommendation 27: The Village should consider working with other municipalities and the Regional District to coordinate the creation of a subregional mobile cache of wildland fire fighting equipment. This would reduce the cost of purchasing and maintaining the cache and provide additional resources in the event of a wildfire.

4.5 Vegetation (Fuel) Management

4.5.1 Objectives

- To proactively reduce potential fire behaviour, thereby increasing the probability of successful suppression and minimizing adverse impact.
- To reduce the hazardous fuel types (C2, C3, C4) found within and adjacent to the Community Assessment Area boundary. Ideally, over the next five to ten years the majority of these fuel types would be converted to deciduous fuel types or thinned and treated to reduce surface fuel loads and raise canopy base height.

4.5.2 *Issues*

- The WRMS developed in support of this plan identified that the core area of the Village is at high risk from wildfire. However, there are areas of extreme wildfire probability immediately adjacent to the interface. Public safety, and many of the important values, facilities and structures, may be severely impacted by a major fire.
- There are a number of hazardous stands of C2 (3 ha), C3 (422 ha) and C4 (226 ha) fuel types in the study area (Map 7). Treatment of other fuel types is not considered necessary. The areas of hazardous fuels should be the focus of a prioritized long-term fuel reduction program. An example of hazardous fuels along a main road into New Denver is shown in Figure 5. While it is probably not feasible to treat all of these areas, it is possible to develop

an annual program that strategically targets progressive fuel reduction in these areas over the next decade.

- Table 4 and Map 8 identify and locate the polygons recommended for treatment consideration. Those polygons closest to the interface are first in treatment priority. The priority 1 treatment areas are adjacent to the municipal boundary and are within 250 m of homes. Treating these areas would enhance the effectiveness of natural fuel breaks around the community. These areas should be the focus of initial treatment efforts. Priority 2 areas surround homes outside the municipal boundary and priority 3 areas pose a spotting hazard to New Denver but are not within 250 m of homes.
- There are a number of existing natural fuel breaks within the Village including deciduous and grassland fuel types (refer to Map 9). Priority 1 areas could be treated to expand the existing natural fuel breaks.



Figure 5. Hazardous fuels adjacent to a major roadway into New Denver.

Table 4. Priority treatment areas.

Priority	Area (ha)
1	91.9
2	95.2
3	464.1
Total	651.2

4.5.3 Recommendations

Recommendation 28: The community should investigate the potential for fuel management programs. A number of high hazard areas immediately adjacent to or embedded in the Village have been identified as part of the wildfire risk assessment. These high hazard areas should be the focus of a progressive thinning program that is implemented over the next five to ten years. Thinning should be focused on the highest priority areas of C2, C3 and C4 fuel types identified in Table 4. In some areas it may be necessary to work closely with the RDCK and the province to implement treatments. A qualified professional forester (RPF), with a sound understanding of fire behaviour and fire suppression, should develop treatment prescriptions. Any treatments that take place on sloped sites must be prescribed with consideration given to slope stability. Where slope stability may be an issue, a Professional Geotechnical Engineer should review the treatment prescription. The community should also investigate the potential for working with private land owners to address hazardous fuels on private land.

Recommendation 29: The mountain pine beetle has the potential to cause significant changes in fuels and fire risk over the next decade and beyond. Where applicable, fuel treatment strategies should target removal of beetle susceptible lodgepole pine. The Village should consider working with the province and private land owners to monitor and quantify changes in fire risk associated with the mountain pine beetle outbreak.

Recommendation 30: The provincial government and the UBCM have funding programs specifically to address wildfire hazard and the wildfire hazard associated with mountain pine beetle on Crown and municipal lands. The Village should consider applying for UBCM funding to carry out fuel treatments that will strategically mitigate fuel hazard within 2 km of the community. The 91.9 ha priority 1 treatment area would be the priority for funding.

Recommendation 31: The Village should investigate the potential for additional funding options, such as a cogeneration plant, a composting program or a minimal increase in property taxes, which could be used to encourage and aid property owners with fuel mitigation and to facilitate treatments on public lands. Efficiencies may be gained if this is coordinated at a regional level.

Recommendation 32: The Village should investigate the potential for partnering with residents to promote treatment of public lands adjacent to private property. Private land owners could be encouraged to not only clean their own yards of debris and brush but also to be responsible for the removal of debris and brush from immediately adjacent public

lands to a depth of 20 meters. Removal of material could be coordinated with a spring yard waste pickup program.

Recommendation 33: The Village should consider lobbying the province to identify and document hazardous fuel types on Crown lands that are not within 2 km of the boundary of the community but that are within 5 km of residential areas that could be impacted by a wildland urban interface fire. Effort should be directed at encouraging the province to initiate a fuel treatment program for these lands. This may include coordinating lobbying initiatives with other local governments from within the Regional District of Central Kootenay.

Recommendation 34: The Village should work with FortisBC to ensure that transmission infrastructure can be maintained and managed during a wildfire event. Maintaining the transmission corridor to a fuel break standard will provide the community with a more reliable power supply that is less likely to fail during a fire event and will reduce the probability of fire spreading into the community. The community should work with FortisBC to ensure that the right-of-way vegetation management strategy includes consultation with the community and the Fire Department so that wood waste accumulations do not contribute to unacceptable fuel loading or diminish the ability of the right-of-way to act as a fuel break.

Recommendation 35: The Village should prioritize the development of a fuel break network that builds on existing breaks such as the cleared areas to the northeast of the municipal boundary (identified as an existing break in Map 9). This would require treatment of priority 1 areas for maintenance as shaded fuel breaks.

4.6 Wildfire Rehabilitation Planning

4.6.1 Objectives

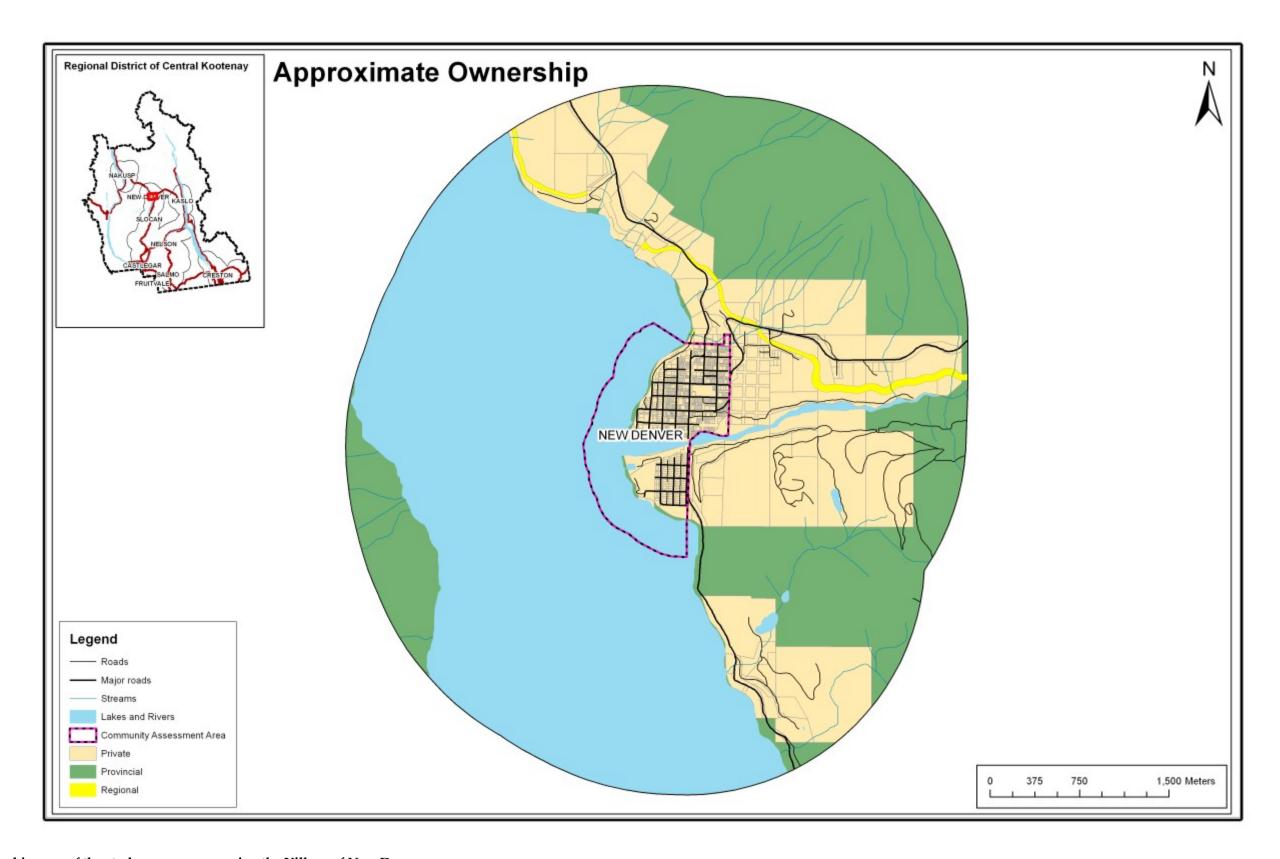
- To reduce the impact of negative post-wildfire effects on the community by preparing a strategic, effective and rapid post-wildfire response.
- To develop advanced planning for post-fire stabilization and rehabilitation in the next five years.

4.6.2 *Issues*

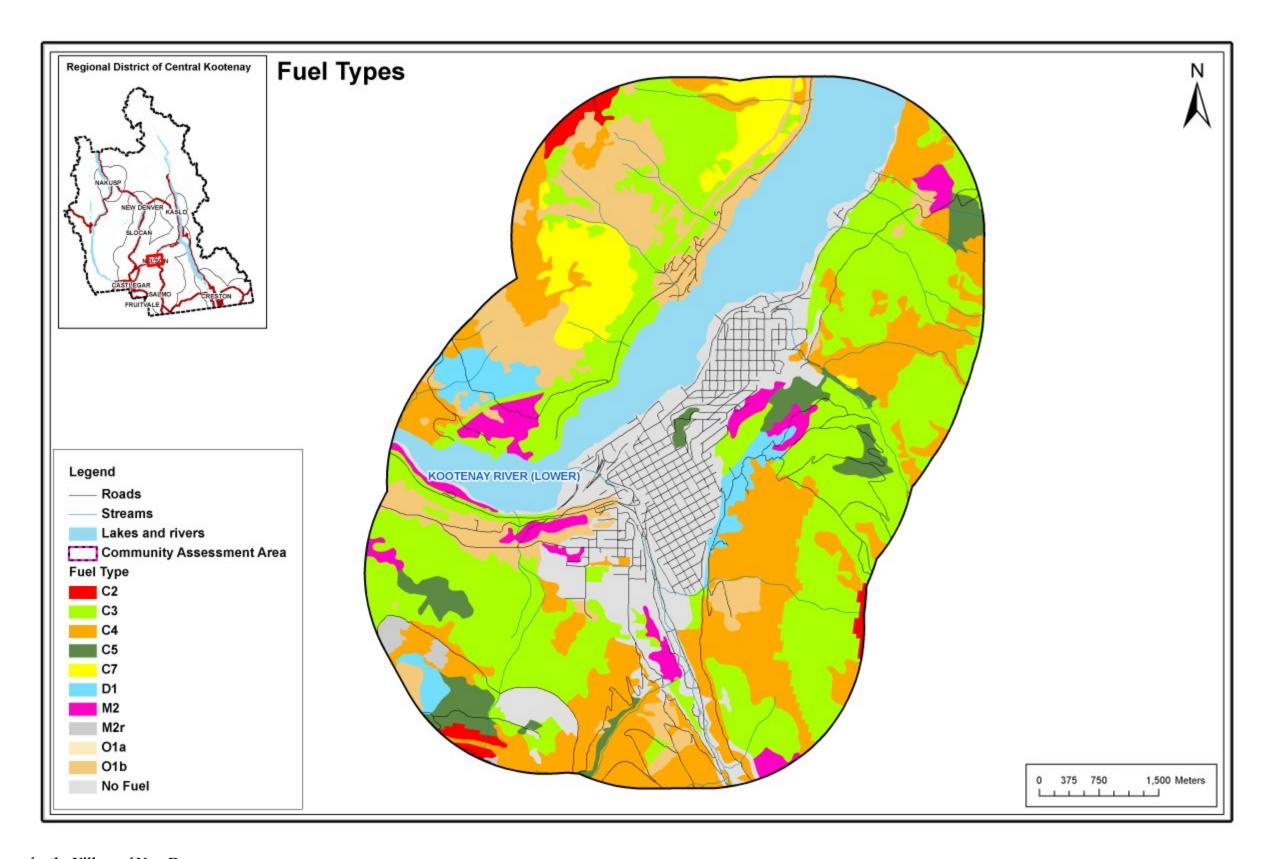
New Denver's water supply is vulnerable to watershed disturbance.

4.6.3 Recommendations

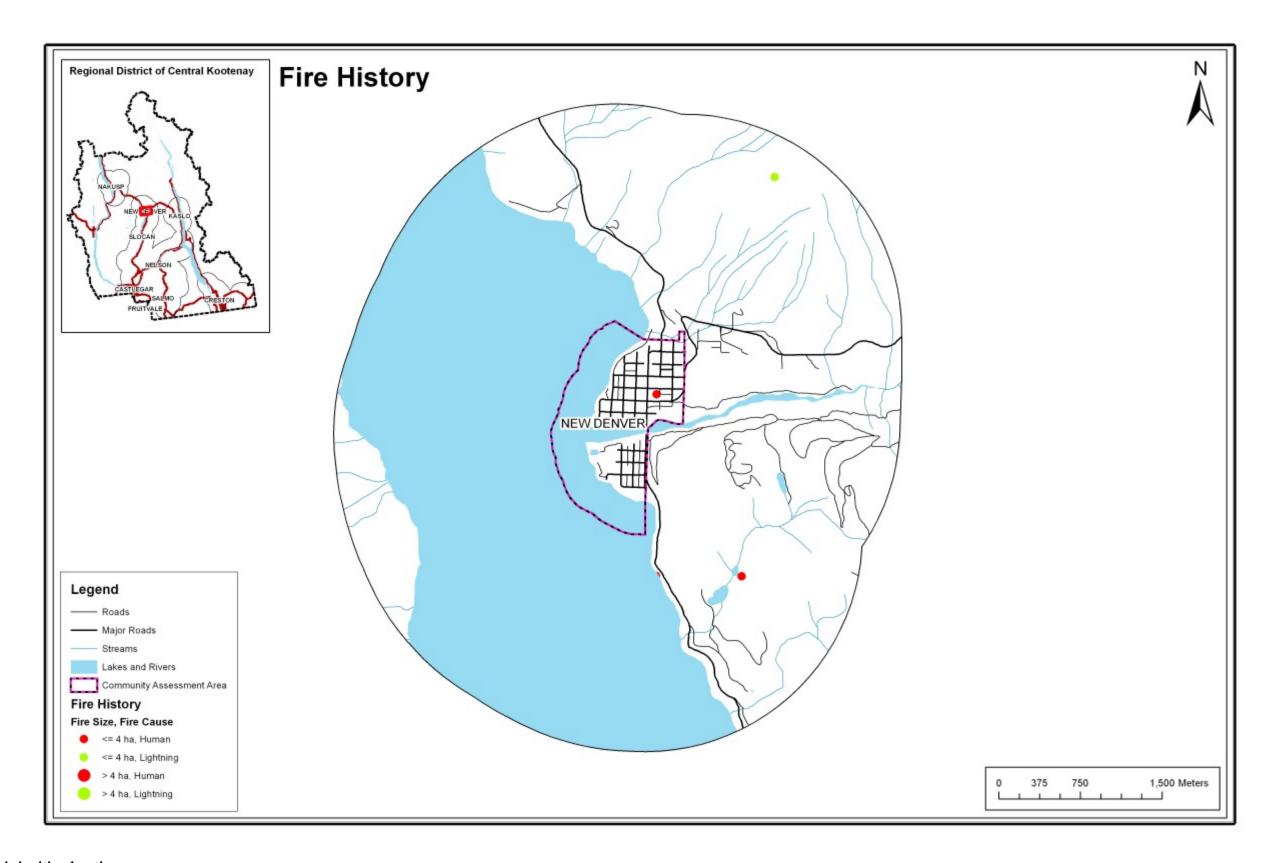
Recommendation 36: The community should develop a plan for post fire rehabilitation that considers the procurement of seed, seedlings and materials required to regenerate an extensive burn area (1,000-5,000 ha). The opportunity to conduct meaningful rehabilitation post fire will be limited to a short fall season (September to November). The focus of initial rehabilitation efforts should be on slope stabilization and infrastructure protection. These issues should form the foundation of an action plan that lays out the necessary steps to stabilize and rehabilitate the burn area.



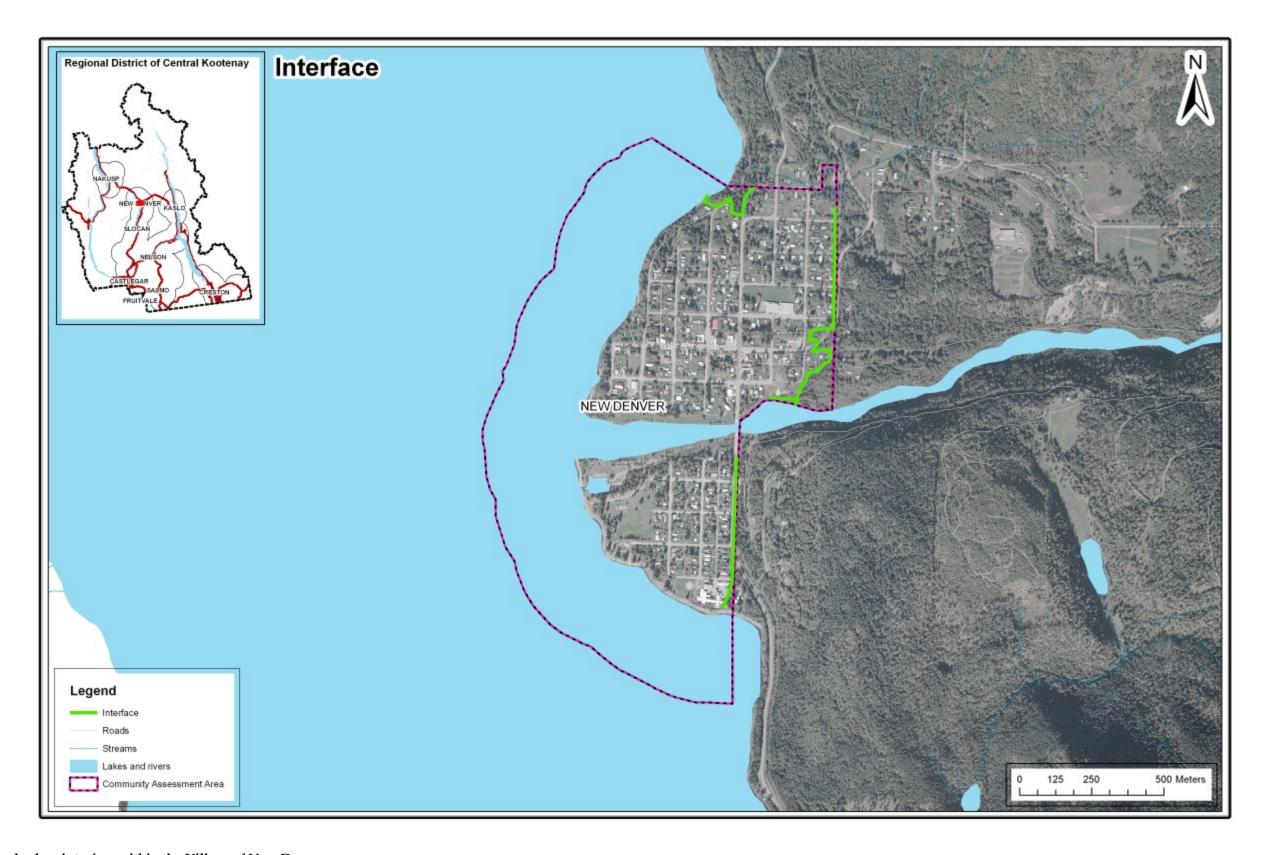
Map 1. Ownership map of the study area encompassing the Village of New Denver.



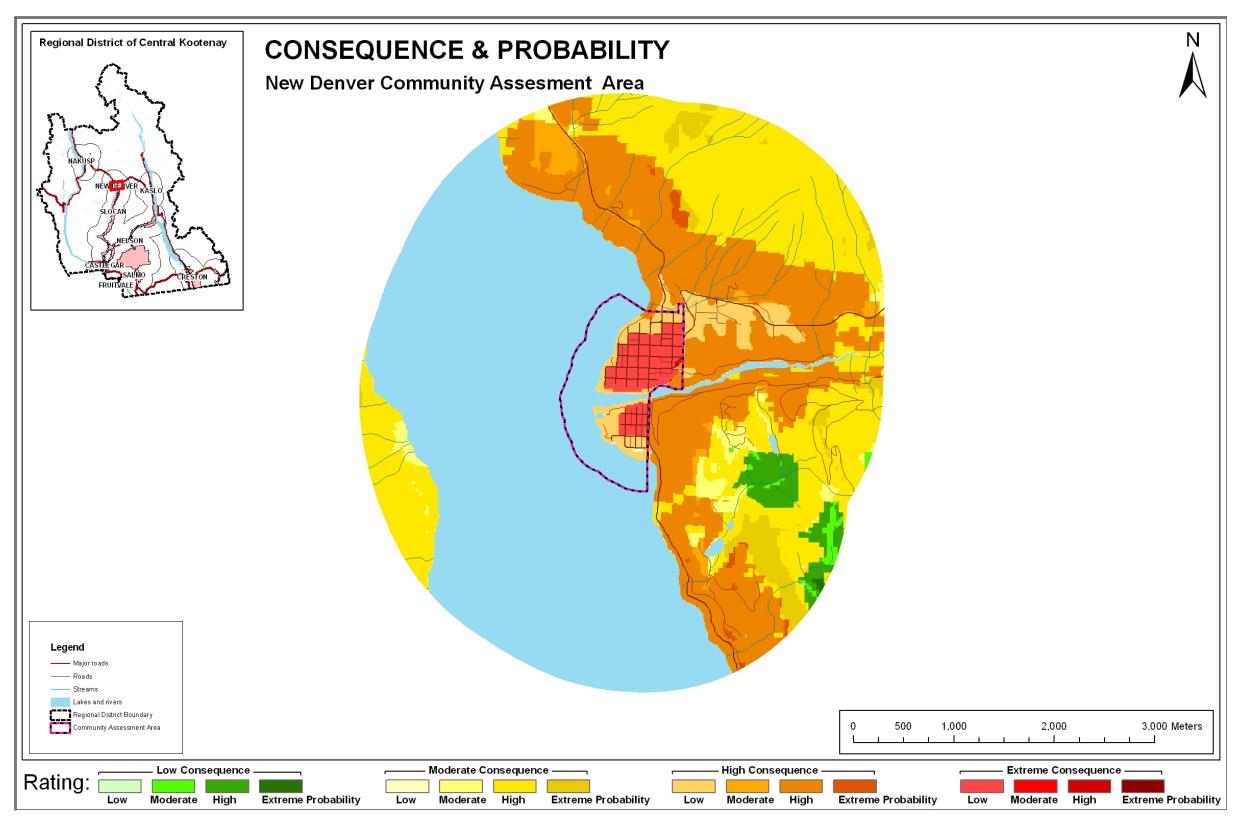
Map 2. Fuel types for the Village of New Denver.



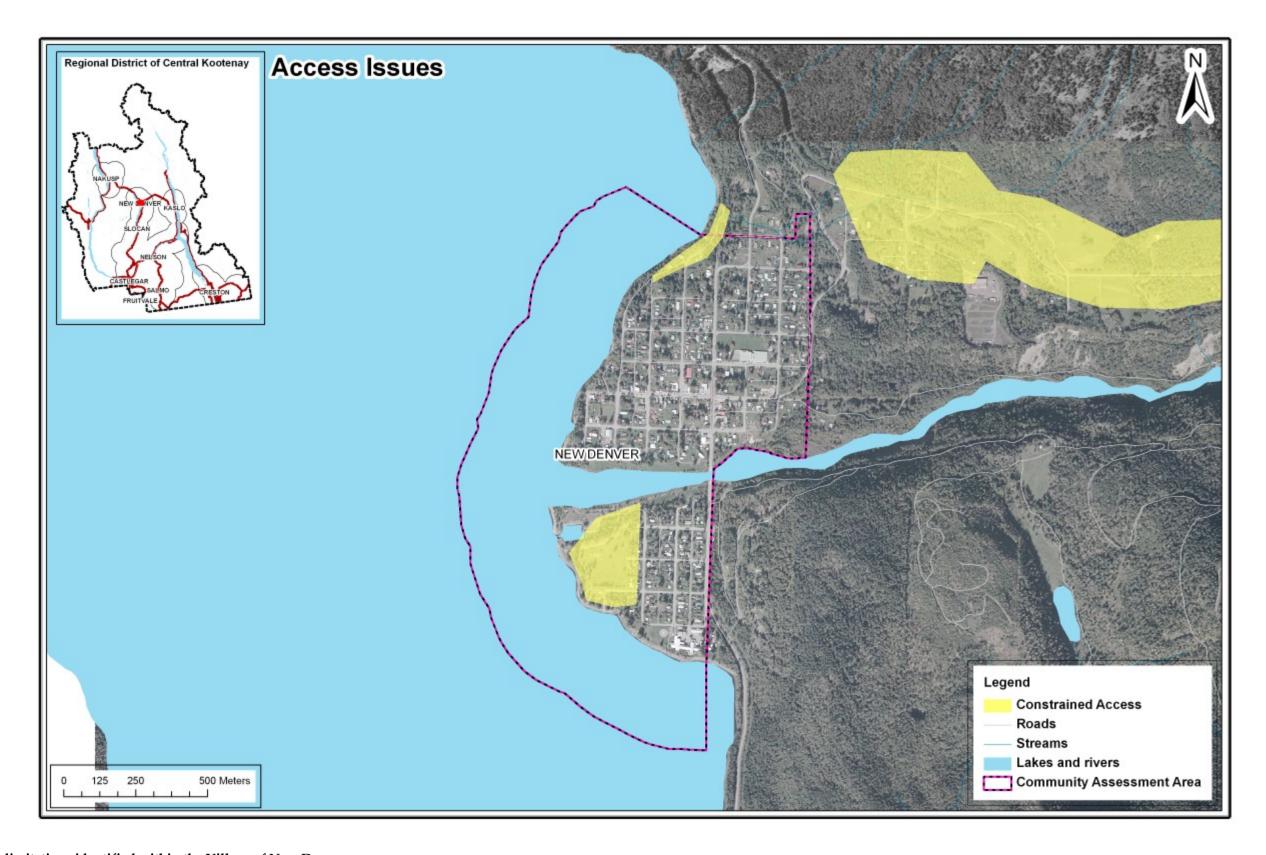
Map 3. Historic ignition locations.



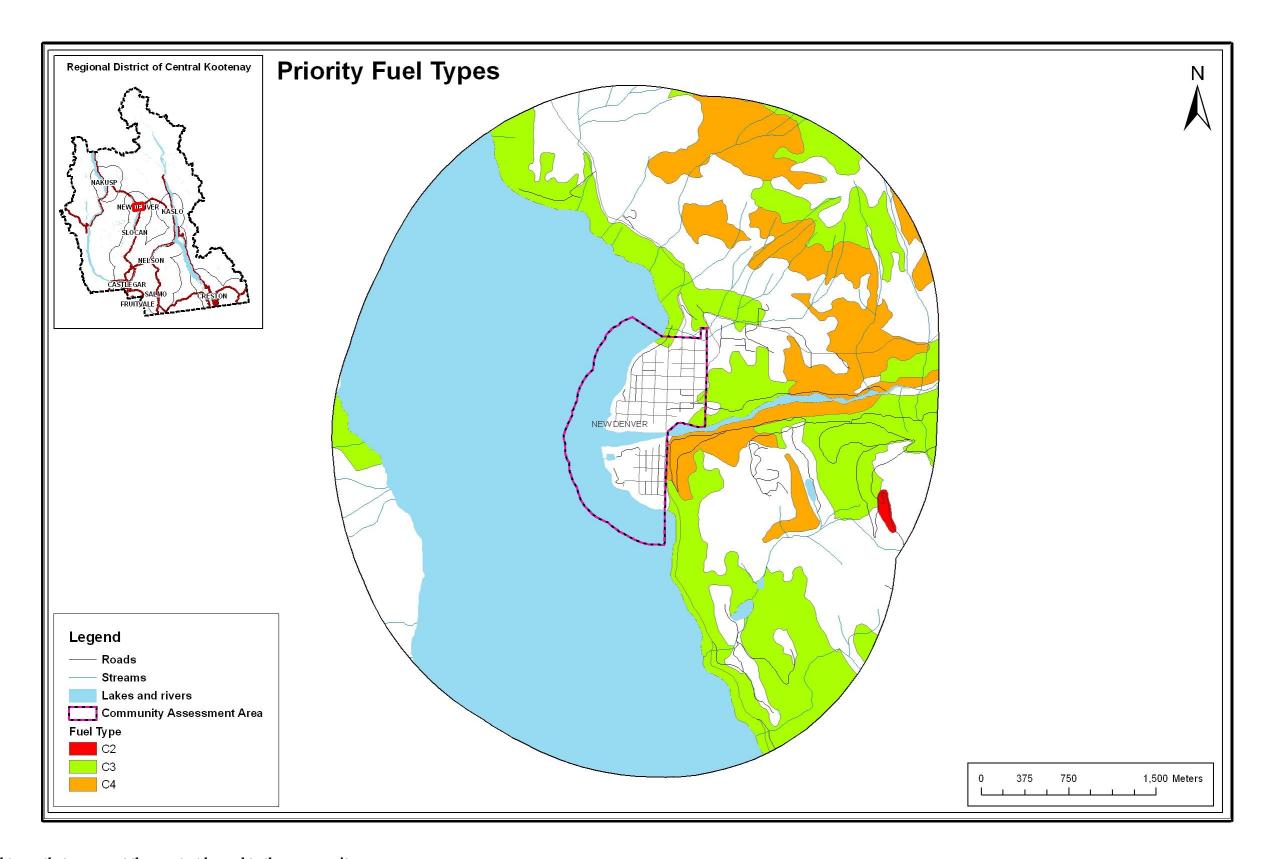
Map 4. Wildland urban interface within the Village of New Denver.



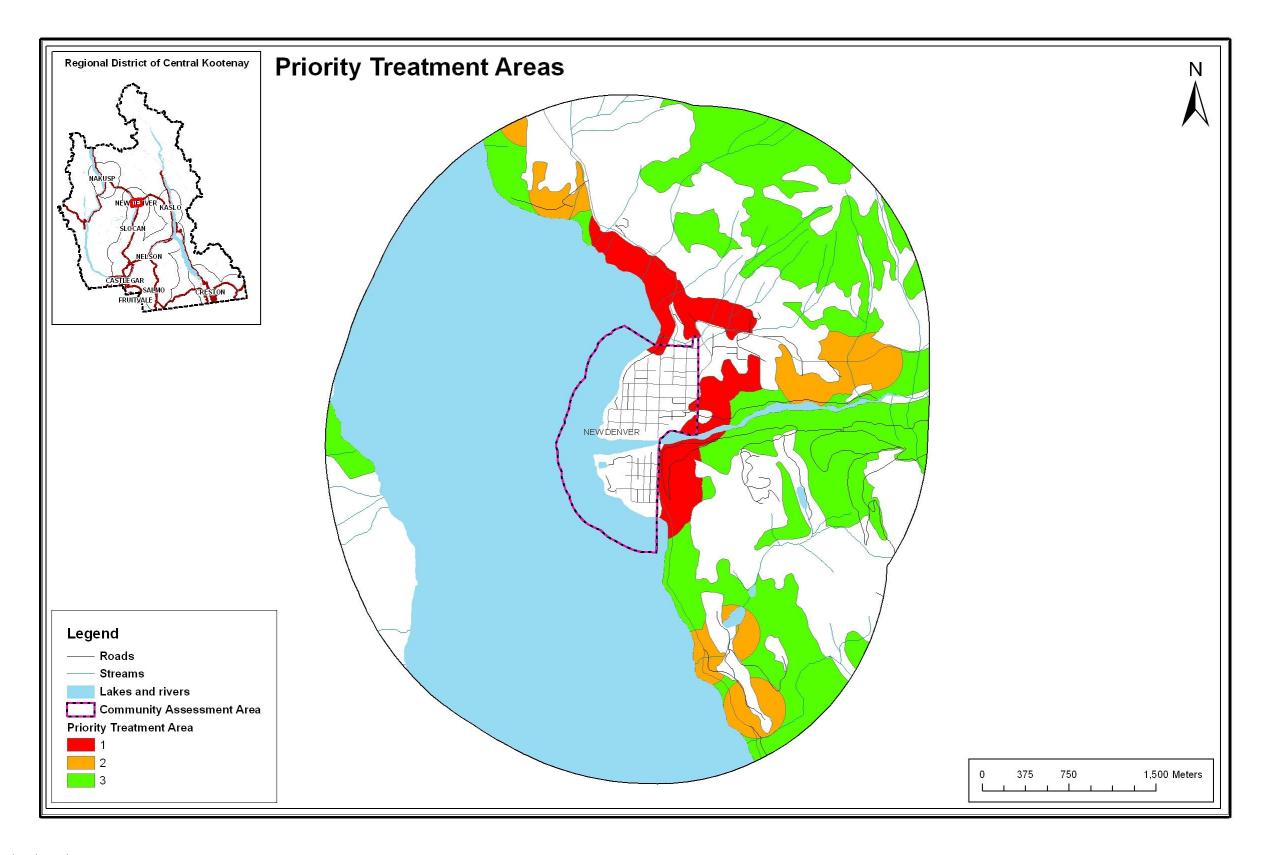
Map 5. Probability and consequence of wildfire in the Village of New Denver.



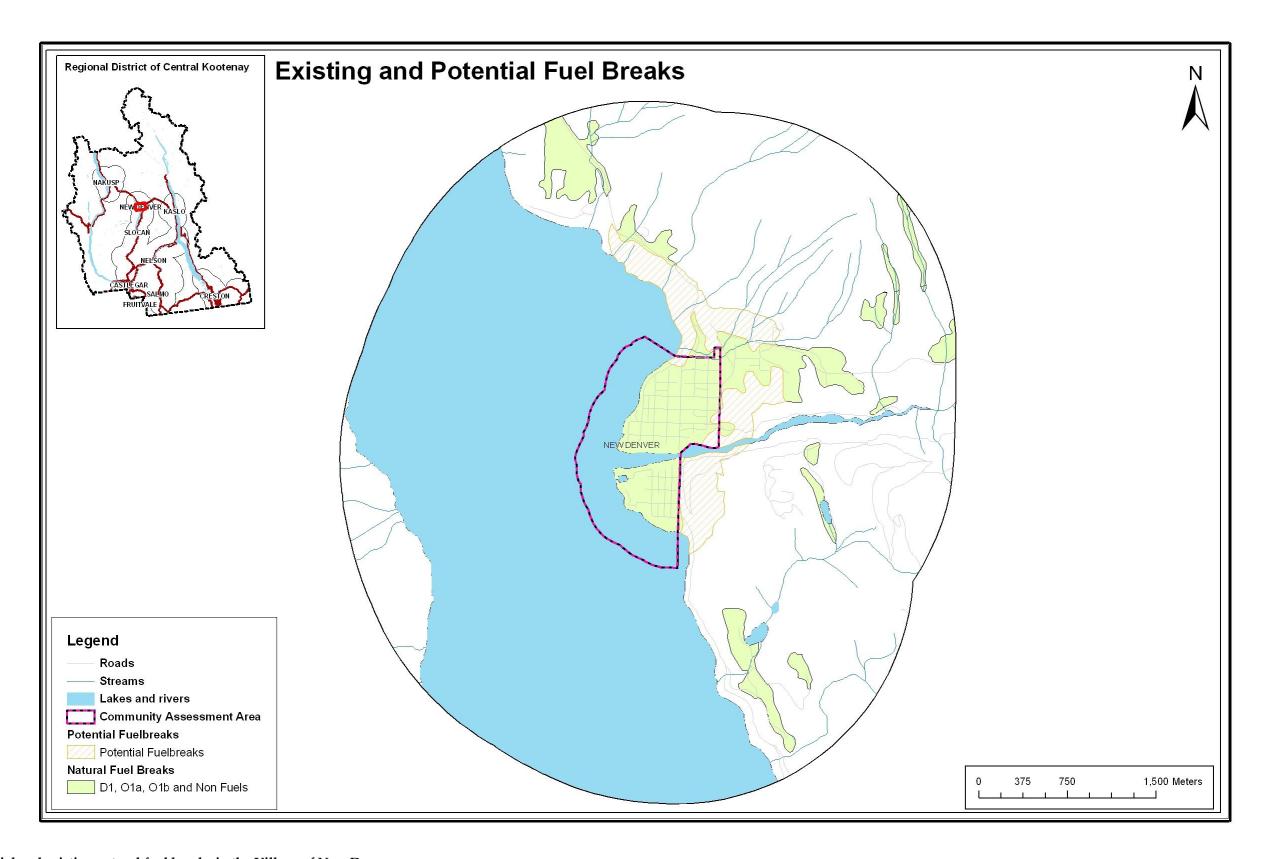
Map 6. Access limitations identified within the Village of New Denver.



Map 7. H Fuel types that represent the greatest hazard to the community.



Map 8. Priority treatment areas.



Map 9. Potential and existing natural fuel breaks in the Village of New Denver.