

SLOCAN FIRE
PROTECTION AREA

COMMUNITY WILDFIRE
PROTECTION PLAN

*Considerations for Wildland Urban Interface
Management in the Slocan Fire Protection Area, British
Columbia*

PART 2

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1.0 Slocan Fire Protection Area

1.1 Study Area

The Slocan Fire Protection Area encompasses rural areas surrounding the Village of Slocan and extends south along both shores of the Slocan River (refer to Figure 1).

The Slocan Fire Protection Area contains a total land area of 2913 ha. The total study area that makes up this plan includes the Fire Protection Area boundary and a 2 km buffer that consists of map sheet numbers: 082F.073, 082F.063, and 082F.083. The total study area is 10 253 ha. An ownership map of the study area is shown in Map 1.



Figure 1. View of topographic relief of the Slocan Fire Protection Area looking north (sourced from Google Earth™, 2007).

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	O1a	O1b	Non	Total
Area (ha)	147	4522	1777	416	843	89	968	2	539	950	10,253
% Total	1	44	17	4	8	1	9	<1	5	9	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 Fire Protection Area. The average number of fires per year by decade is as follows: 1950-59 – 1.6; 1960-69 – 1.5; 1970-79 – 1.4; 1980-89 – 0.4; 1990-1999 – 1.0. During the period 2000-2005 an average of 0.5 fires per year was reported. The most significant fire year in recent history was 1965 when 6 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 62, of which 45% were the result of human causes. The remaining 55% of fire ignitions were lightning caused. Ninety-eight percent of all fires that burned between 1950 and 2005 were smaller than four hectares, while only 1 fire was greater than 4 hectares. The largest fire within the FPA since 1950 occurred in 1960 and burned an area of 242.8 hectares.

Table 3 summarizes fire cause by decade. Through the time of record, lightning caused fires have out-numbered those caused by humans. On average, there have been 12 fires each decade (minimum 4 in the '80s and maximum 16 in the '50s). 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	61	98	34	27
4.0-10.0				
>10.0	1	2		1
Total Fires	62	100	34	28

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

Decade	Lightning	Direct Human ¹	Industrial ²	Total
1950-1959	6	8	2	16
1960-1969	8	7		15
1970-1979	9	4	1	14
1980-1989	2	2		4
1990-1999	6	4		10
2000-2005	3			3
Total Fires	34	25	3	62

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

² Equipment, railway

2.0 The Wildland Urban Interface

Development within the Fire Protection Area of Slocan is defined as intermix because there is little definition between development and the wildland. Map 4 shows areas within the community defined as intermix.

3.0 Community Risk Profile

Map 5 shows the results of the wildfire risk assessment for the Fire Protection Area of Slocan. The study area is defined as having high to extreme probability and moderate to high consequence of wildfire (excluding the Village of Slocan). Variation in consequence is largely a function of where development exists and in what density. The results indicate that there is a high probability of a wildfire event occurring and that, in developed areas, the values assessed for fire risk as part of this project are likely to be severely impacted by a fire.

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 RDCK 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 RDCK 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.
- There is no fire danger signage in the Fire Protection Area.

4.1.3 *Recommendations*

Recommendation 1: The RDCK should consider developing a communication plan to outline the purpose, methods and desired results of communication and education in Fire Protection Areas. 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 RDCK 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 within Fire Protection Areas. 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 RDCK should enhance their existing website to outline Fire Protection Area fire risks, current fire danger and proactive steps individual homeowners can take to make their homes safer within the Fire Protection Area. Other information, such as fire danger and FireSmart principles, should be maintained on the regional site.

Recommendation 4: The RDCK should access local newspapers or community bulletins to deliver FireSmart educational materials or mail materials to residents as was done in 2004.

Recommendation 5: The RDCK should investigate creating a central phone number accessible to the public with messages updating fire bans and fire danger rating.

Recommendation 6: The Regional District should establish communications with the MOFR for daily updates during the fire season. This information should be relayed to individual Fire departments and to the homes of the Fire Chiefs and Deputy Chiefs.

Recommendation 7: Fire halls should be assessed to ensure that they meet or exceed FireSmart recommendations. Additionally, fire halls should have emergency power backup and be equipped with sufficient resources to act as alternate incident command posts. Alternatively, sub-regional caches could be provided with incident command centre equipment.

Recommendation 8: Signage consisting of current fire danger, campfire bans and general warnings regarding fire safety should be posted at all major entrances to the Fire Protection Area and updated with current fire information as required.

Recommendation 9: The Regional District should consider developing a campfire ban bylaw and, in conjunction with the Fire Chief, implement the ban at times of high fire danger when provincial bans are not in place. The bylaw should consider effective and efficient enforcement measures and powers.

Recommendation 10: The Fire Department and the Regional District should work with the regional 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

- Some homes do not meet the FireSmart structure hazard standards for interface fire safety.
- Currently there is no fire vulnerability standard for roofing material used in the Fire Protection Area. Many homes are constructed with unrated materials that are considered a major hazard during a large fire event. In addition to the vulnerability of roofing materials within the community, adjacent vegetation is often in contact with roofs, or roof surfaces are covered with litter fall and leaves from nearby trees. Figure 2 shows an example of a home with wood siding and open areas that are vulnerable to ember attack.
- Unrated roofing materials contribute significantly to fire risk in communities. In the short term, a resolution to this issue is difficult given the significant cost to homeowners. However, over the long-term, altering the building code or bylaws to encourage a change in roofing materials when roof replacement of individual residences is required may be a solution.
- Combustible materials stored within 10 m of residences are also considered a significant issue. Woodpiles or other flammable materials adjacent to the home provide fuel and ignitable surfaces for embers.



Figure 2. Example of home with wood siding and open decks.

4.2.3 Recommendations

Recommendation 11: Many homes and businesses within the Fire Protection Area are built immediately adjacent to the forest edge. As a result, trees and vegetation are often in direct contact with homes. The Regional District should incorporate building setbacks into bylaw with a minimum distance of 10 m when buildings border the forest interface.

Recommendation 12: It is recommended that the RDCK conduct detailed FireSmart assessments of homes and businesses within Fire Protection Areas to further communicate and promote fire risk reduction on private property. The WRMS developed for individual Fire Protection Areas indicates that many areas of the Regional District are at high risk from wildfire.

Recommendation 13: The RDCK should investigate the policy tools available for reducing wildfire risk within the Fire Protection Area. 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 within Fire Protection Areas, provides for good access for emergency response, and specifies fuel management on both public and private property.

Recommendation 14: The RDCK should consider requiring roofing materials that are fire retardant with a Class A and Class B rating within new subdivisions. While it is recognized that wholesale changes to existing roofing materials within the community are not practical, a long-term replacement standard that is phased in over the roof rotation period would significantly reduce the vulnerability of the community. The RDCK 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 15: The RDCK should consider working with the Building Policy Branch to create a policy structure that would enable the Fire Protection Area to better address wildland urban interface protection considerations for buildings.

Recommendation 16: The RDCK 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.

Recommendation 17: 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 18: Subdivision design plans should be reviewed by the Fire Department to ensure that suitable access routes exist, that hydrant accessibility is adequate and that interface fire related issues are adequately addressed within the development.

Recommendation 19: As Fire Department officials can only request rather than force an illegal fire to be extinguished, the Regional District should consider enacting a mechanism such as a 'fee for service charge' or developing a policy to enforce regional bylaws if Fire

Departments are called out to attend illegal burning. The issue of illegal fires is considered significant in the uncontrolled areas of the Regional District and requires action.

Recommendation 20: Given the wildfire risk profile of the Fire Protection Area, an emergency sprinkler kit capable of protecting 30 to 50 homes should be purchased and maintained in the RDCK. 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.

4.3 Emergency Response

4.3.1 Objectives

- To develop an emergency response plan that enables effective evacuation, improves firefighter 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.
- 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 Slocan Fire Department to access specific areas due to the potential for resources to be isolated or cut off. Defence of these locations would be secondary to safety considerations.

4.3.3 Recommendations

Recommendation 21: Consideration should be given to developing a regional initial attack crew as other regional districts such as Metro Vancouver and the Capital Regional District have done. The location of this crew should be determined in consultation with communities and fire chiefs. The crew could consist of seasonal and permanent staff. Permanent staff could be trained to offer S100 and S215 training to fire departments as well as providing other support such as community education and communication during the non-wildfire season.

Recommendation 22: A formal communication structure should be established with the MOFR so that information regarding fires within 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, the communities, Fire Protection Areas and the MOFR.

Recommendation 23: Consideration should be given to developing community evacuation plans in each Fire Protection Area. 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 24: The Regional District should consider working towards improving access in identified areas that are considered isolated and that have inadequately developed access for evacuation and fire control.

Recommendation 25: The Regional District should consider providing an accurate and detailed set of maps to all Fire Protection Area Fire Departments. Maps should provide details related to access and evacuation routes, water supply, subdivision layout and the fire risk mapping developed as part of this project. Periodic updates to the mapping will be required in areas of the Regional District where development is active.

Recommendation 26: During a large wildfire it is possible that critical infrastructure within the Fire Protection Area could be severely impacted by smoke. It is recommended that contingency plans be developed in the event that smoke causes evacuation of the Fire Protection Area's incident command centres. The Regional District should co-operate with provincial and regional governments to identify alternate incident command locations and a mobile facility in the event that the Fire Protection Area is evacuated.

Recommendation 27: 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 28: 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 29: The RDCK 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.

Recommendation 30: The RDCK should review the safety of current water fill locations and procedures related to water transportation to ensure that tendering is safe and as efficient as feasible.

Recommendation 31: The RDCK should consider establishing standpipes at safe locations adjacent to bridges and other water access points. Gravity fill tanks or permanent pumps should be established in strategic locations where tendering distances and return times are prohibitive.

Recommendation 32: Given the values at risk identified in this plan, it is recommended that, during periods of extreme fire danger (danger class V), individual Fire Protection Areas work with adjacent municipalities, the Regional District and the Ministry of Forests and Range to maintain a local helicopter with a bucket on standby within 30 minutes of each Fire Protection Area.

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 Slocan Volunteer Fire Department has received training to Ministry of Forests and Range (MOFR) standards. However, personnel require updated training.

- Wildland fire fighting equipment and personal protective equipment is not adequate to outfit all personnel.

4.4.3 *Recommendations*

Recommendation 33: The following training should be maintained/considered: 1) The S100 course training should continue on an annual basis; 2) Regional 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 senior officers on an ongoing basis; and, 5) Incident Command System training should be given to all rural Fire Chiefs. Funding for proper training and compensation for members who wish to take S100 or S215 should be provided by the RDCK.

Recommendation 34: Fire Departments 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, these agencies 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 35: The Regional District and Fire Departments should consider reviewing 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 36: The Regional District should consider coordinating the creation of sub-regional mobile caches of wildland fire fighting equipment with Fire Protection Areas and adjacent communities. This would reduce the cost of purchasing and maintaining the caches and provide additional resources in the event of a wildfire.

Recommendation 37: The Regional District should consider retaining a contract fire fighting crew of 20 fire fighters to assist MOFR crews in initial attack and fire containment during periods of high and extreme hazard. These resources could be made available as needed throughout the district for both fire fighting and fuel hazard mitigation.

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 Fire Protection 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 Fire Protection Area is at very high risk from wildfire. 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 (147 ha), C3 (4,522 ha) and C4 (1,777 ha) fuel types in the study area. 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. The goals of thinning are to remove hazardous fuels and to reduce the overall fire behaviour potential adjacent to the community. Examples of hazardous fuels in the Slocan Fire Protection Area are shown in Figure 3 and Figure 4.
- Treatment efforts should be directed to the fuels identified as Priority 1 (Map 7). These consist of hazardous fuels within 250 m of identified structures. Priority 2 fuels are a secondary focus, subject to available resources, and may be considered in conjunction with Priority 1 fuels when larger treatment areas are feasible or additional areas are required due to tenure constraints. Priority 2 fuels are defined as C2 and C4 fuels located between 250 m and 1 km of identified structures. If possible, an annual program that strategically targets progressive fuel reduction in these areas should be implemented. Priority 3 fuels are the remaining hazardous fuels in the study area. Given the scale of Priority 3 fuels, treatment is not likely to be economically or logistically feasible for the majority of these areas, however portions of these areas may be useful in the strategic location of fuel treatments. Table 4 and Map 7 identify the prioritized areas recommended for treatment consideration.



Figure 3. Photo of dense second growth stand with low canopy base height.



Figure 4. Photo of dense second growth stand.

Table 4. Fuel polygons that are a priority for treatment consideration.

Priority Rating	Public Lands (ha)	Private Lands (ha)	Grand Total (ha)
1	148	672	820
2	338	380	718
3	4192	715	4907
Total Area	4678	1767	6446

4.5.3 Recommendations

Recommendation 38: The RDCK should investigate the potential for fuel management programs. A number of high hazard areas immediately adjacent to or embedded in the Fire Protection Area have been identified as part of the wildfire risk assessment. The RDCK should investigate the potential for fuel management programs. 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 priority 1 and 2 areas identified in Map 7. 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 RDCK should also investigate the potential for working with private land owners to address hazardous fuels on private land.

Recommendation 39: 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 RDCK should consider working with the province, municipalities and private land owners to monitor and quantify changes in fire risk associated with the mountain pine beetle outbreak.

Recommendation 40: 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 RDCK should consider applying for UBCM funding to carry out fuel treatments that will strategically mitigate fuel hazard within 2 km of the Fire Protection Area. The 820 ha priority 1 treatment area would be the focus for funding.

Recommendation 41: The RDCK 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 and shared with RDCK municipalities.

Recommendation 42: The RDCK should investigate the potential for working with the Ministry of Transportation and Highways to maintain major roadways as fuel breaks through communities. This would be achieved by thinning the understory and raising the height to live crown on either side of the roadway to a depth of 50 m.

Recommendation 43: The RDCK 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 44: The RDCK should prioritize the development of a fuelbreak network that builds on existing breaks such as the major roads running through the Fire Protection Area.

4.6 Wildfire Rehabilitation Planning

4.6.1 Objectives

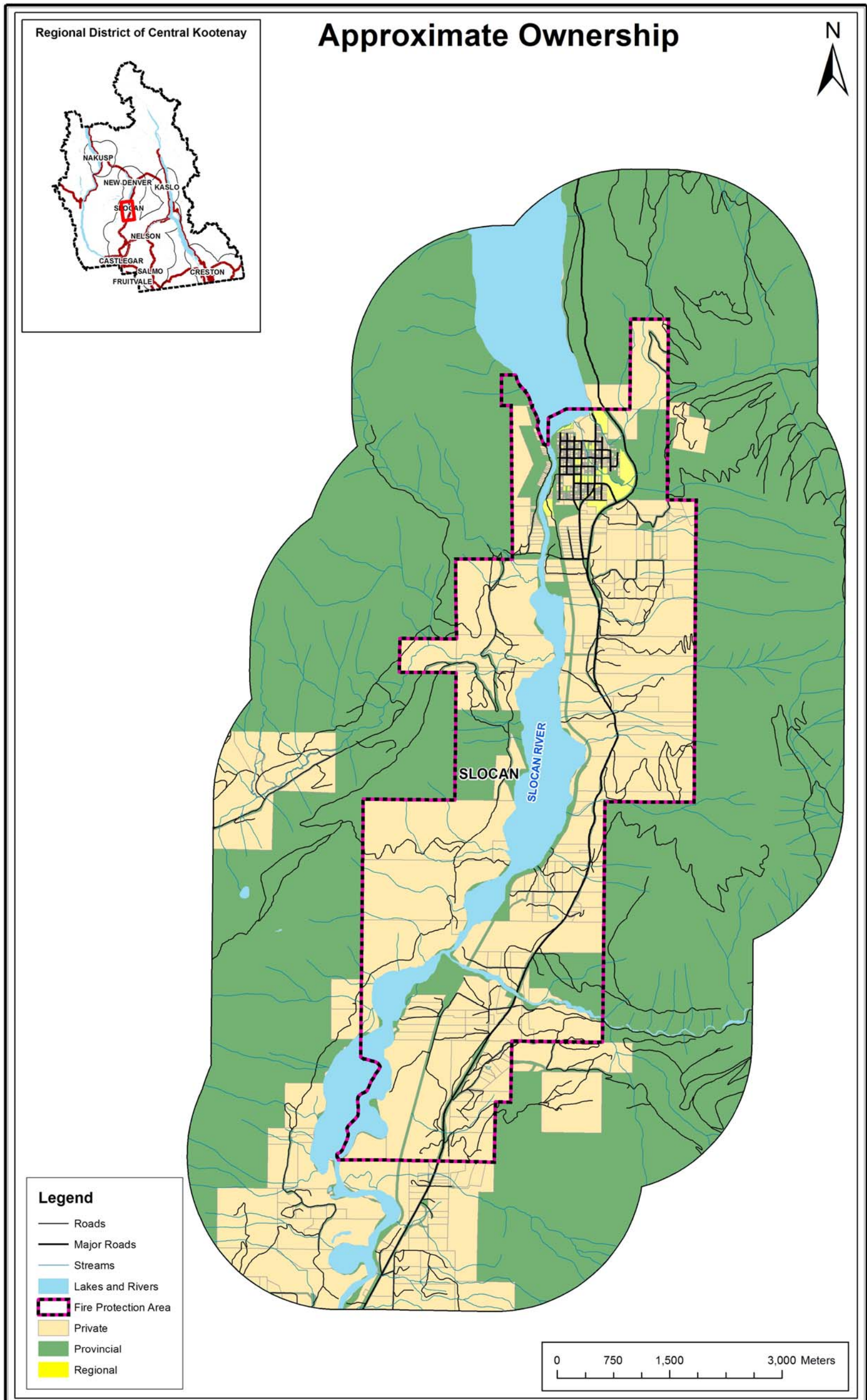
- To reduce the impact of negative post-wildfire effects on the community by preparing a strategic, effective and rapid post-wildfire response.
- To develop advanced planning for post-fire stabilization and rehabilitation in the next five years.

4.6.2 Issues

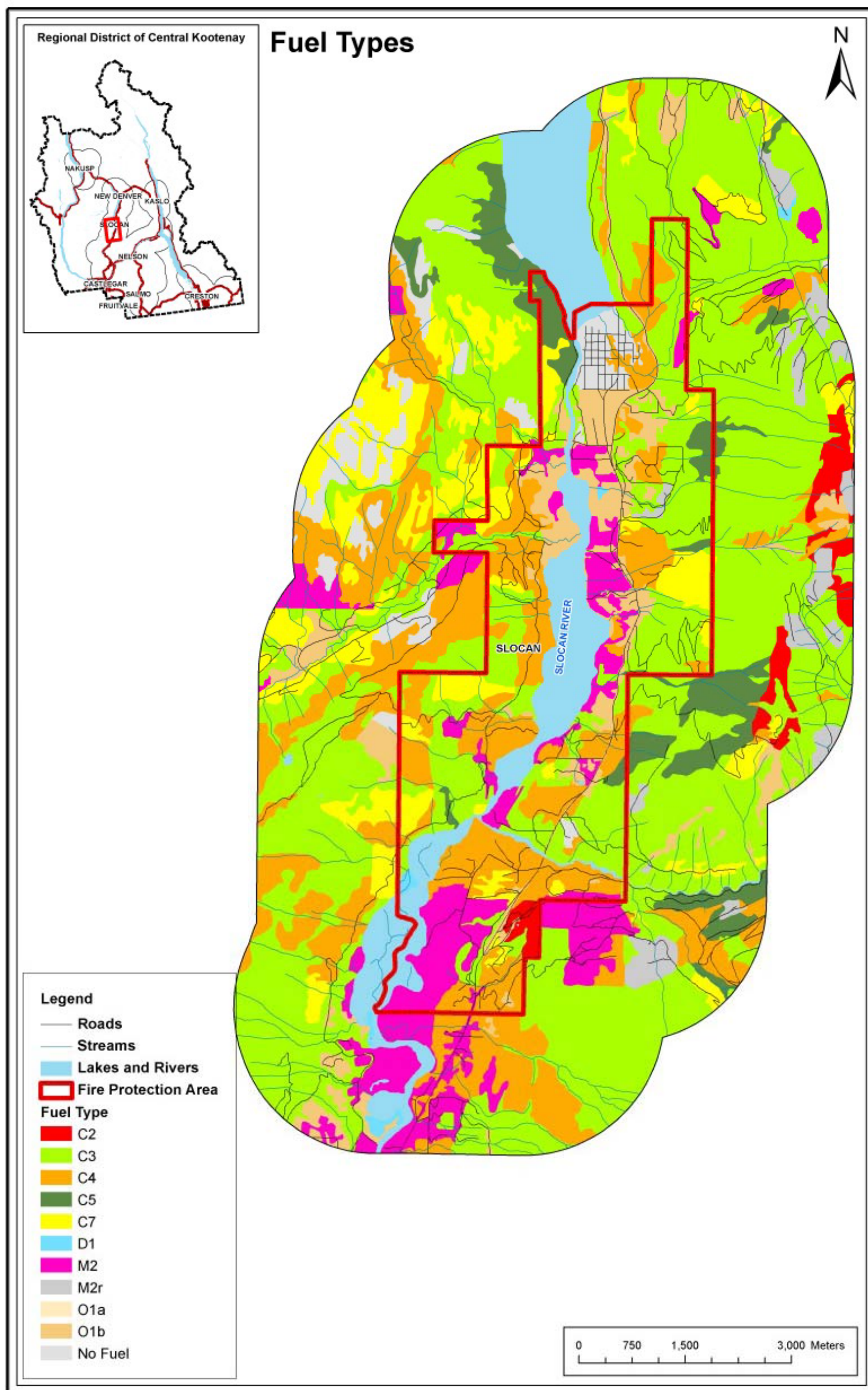
- The water supply in the Slocan Fire protection Area is vulnerable to watershed disturbance.

4.6.3 Recommendations

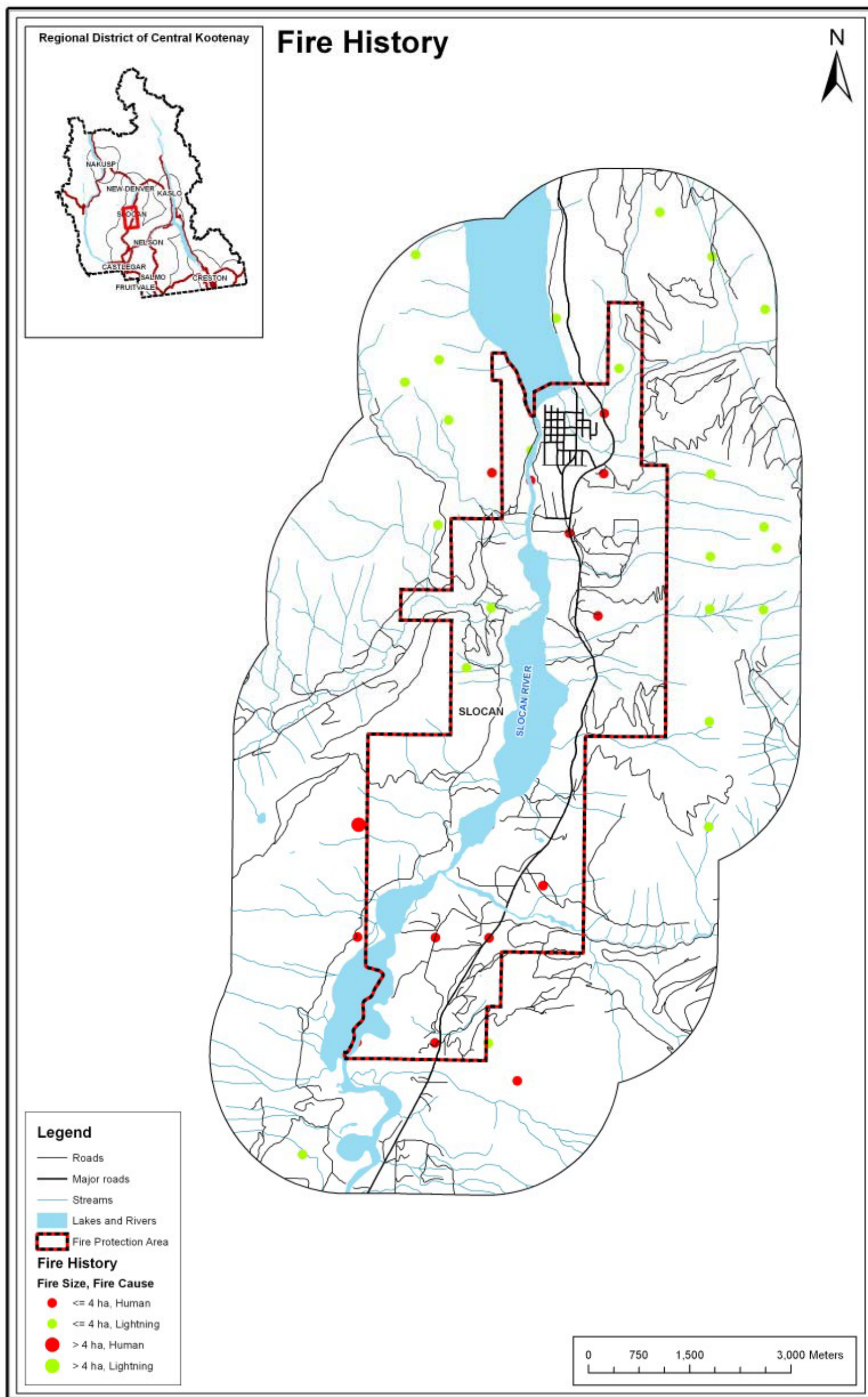
Recommendation 45: Individual Fire Protection Areas should develop plans for post fire rehabilitation that consider the procurement of seed, seedlings and materials required to regenerate an extensive burn area (1,000-5,000 ha). The opportunity to conduct meaningful rehabilitation post fire will be limited 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.



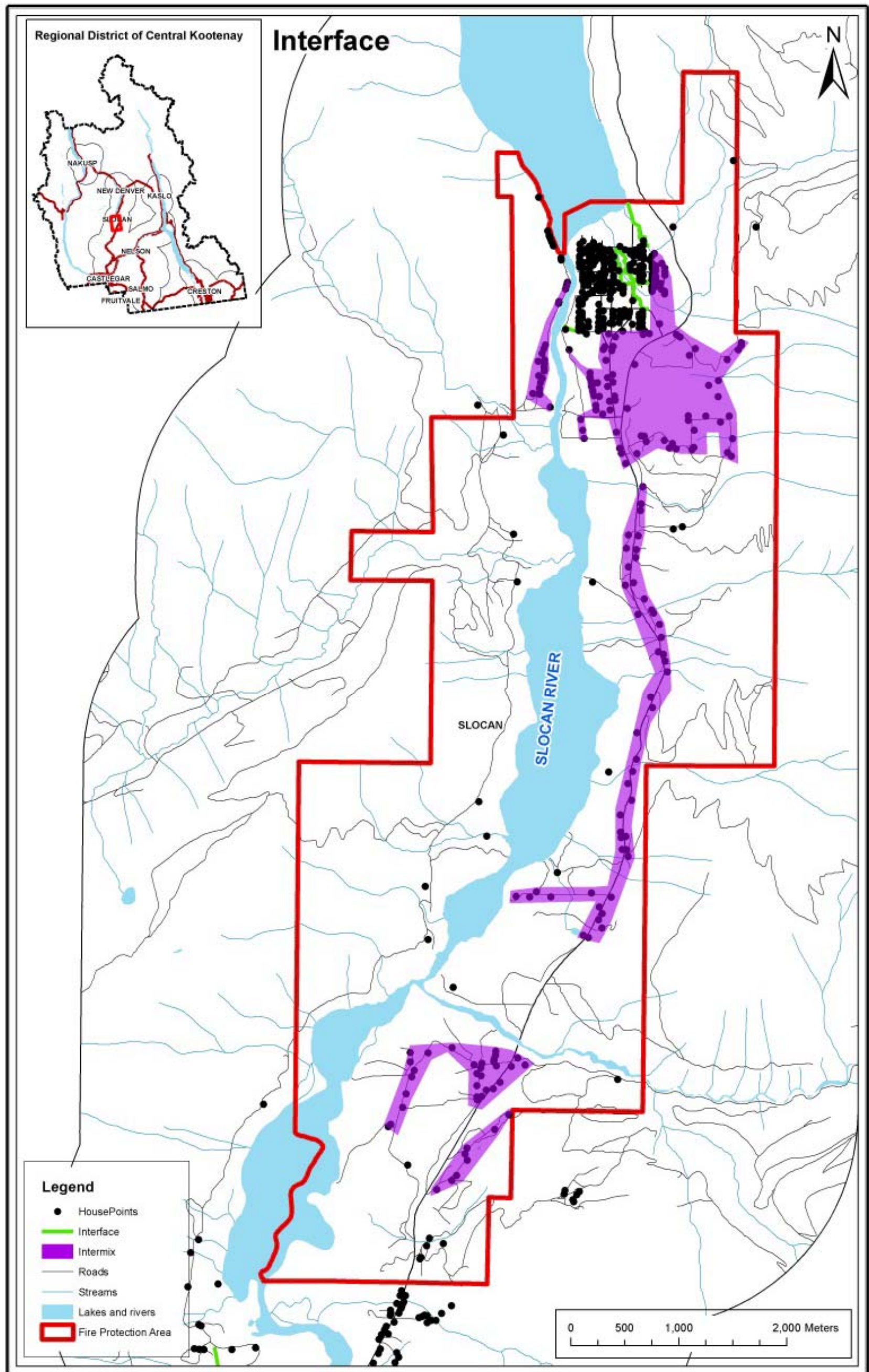
Map 1. Ownership map of the study area encompassing the Slocan Fire Protection Area.



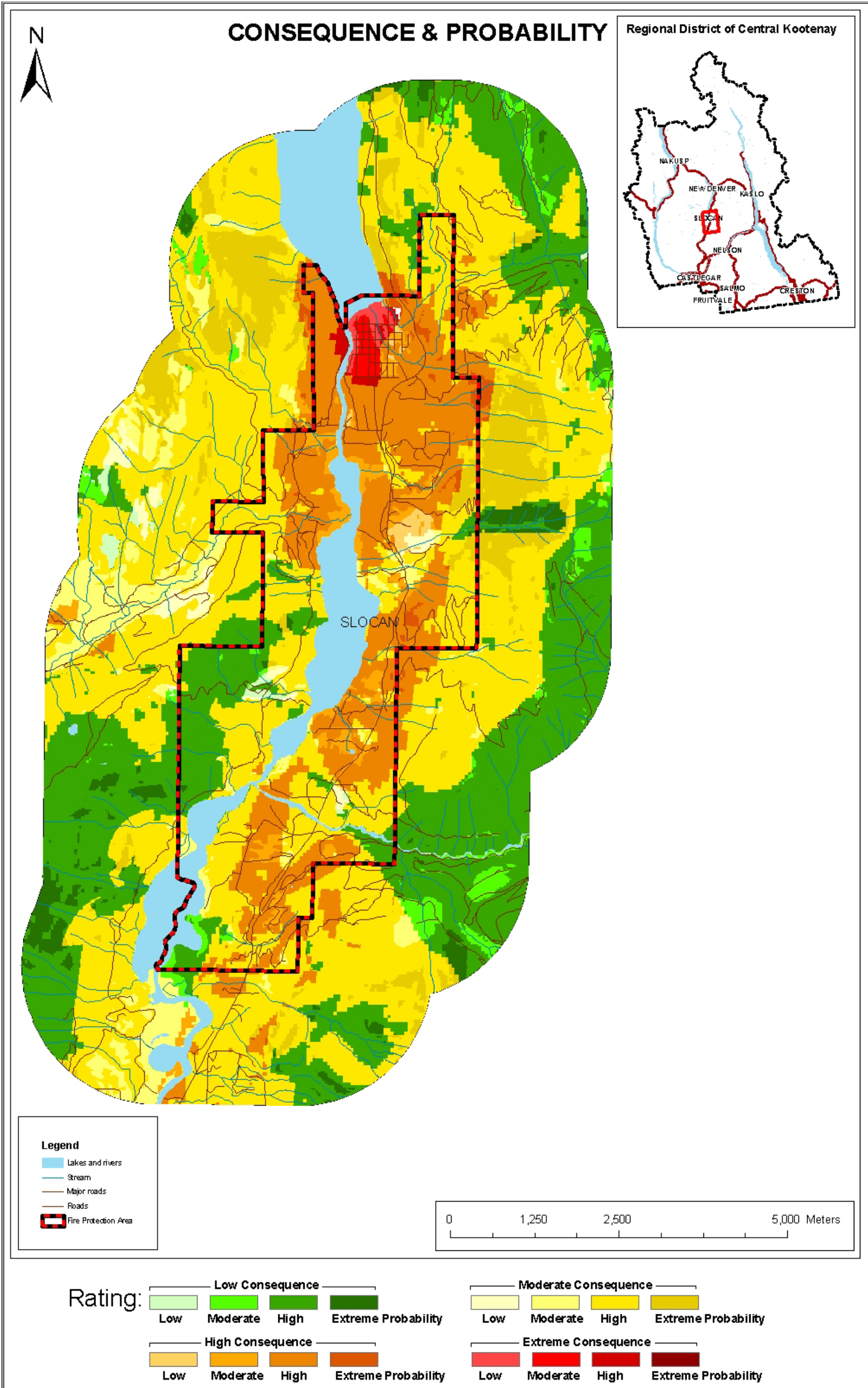
Map 2. Fuel types within the Slocan Fire Protection Area.



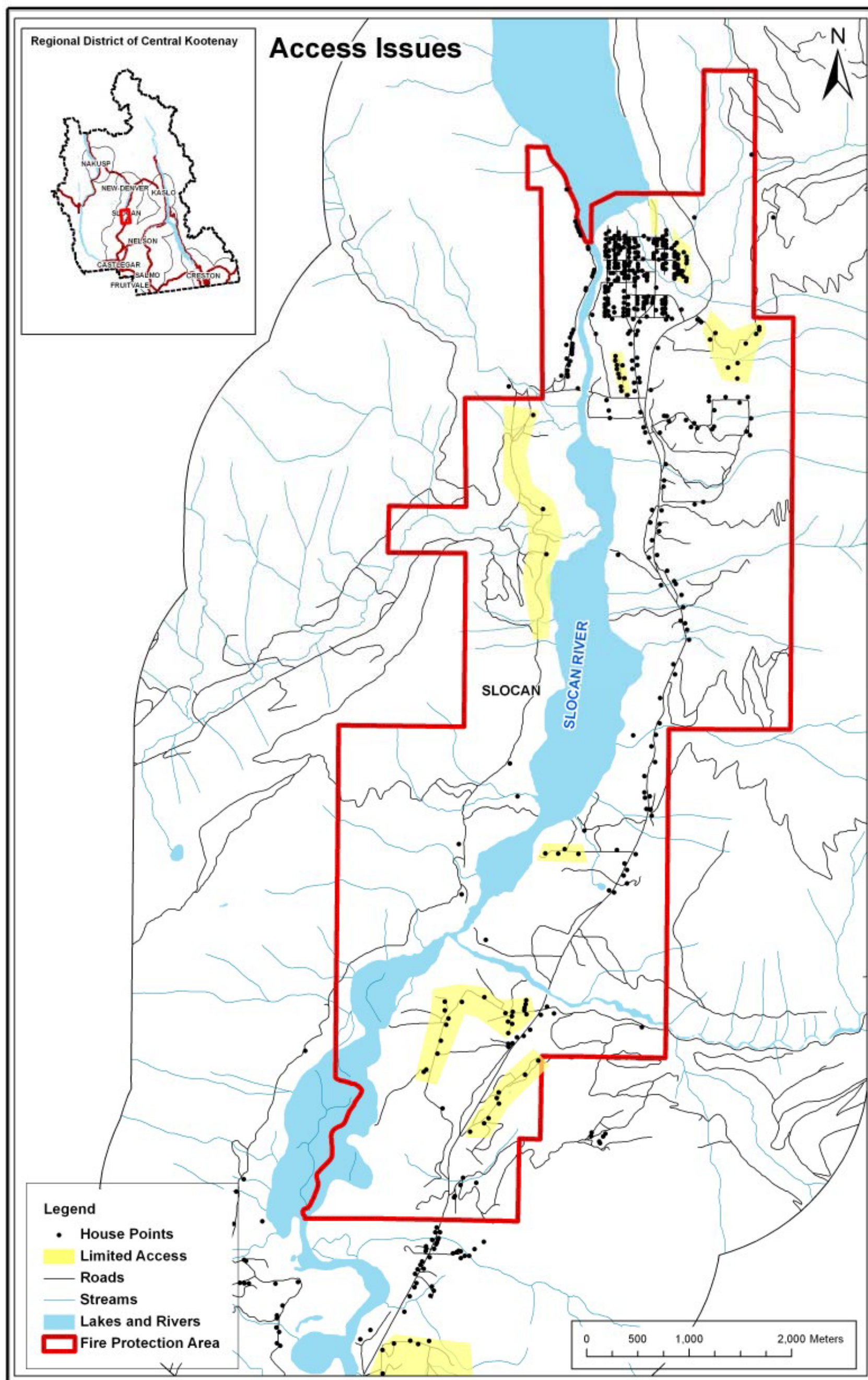
Map 3. Historic ignition locations.



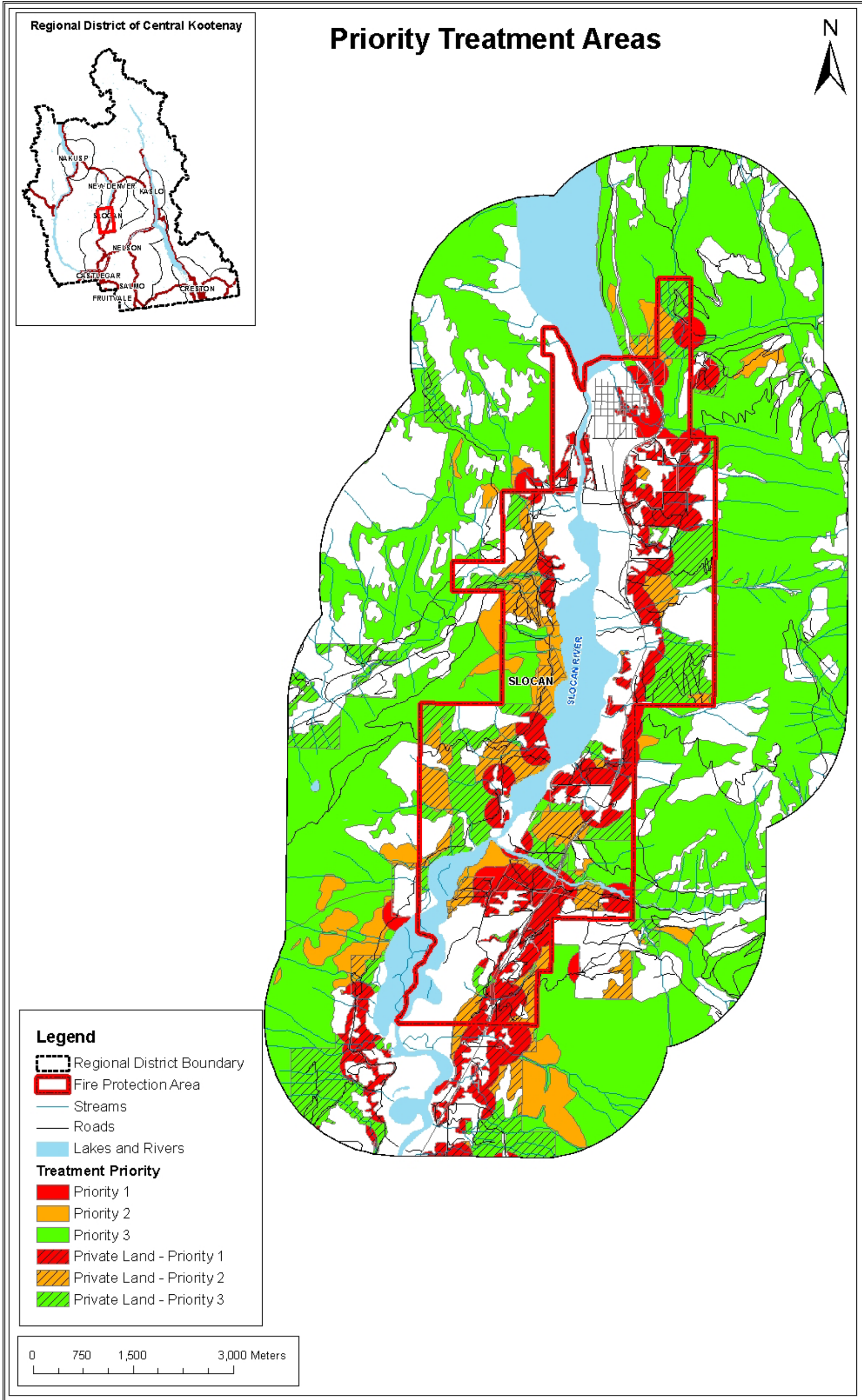
Map 4. Wildland urban interface within the Slocan Fire Protection Area.



Map 5. Probability and consequence of wildfire in the Slocan Fire Protection Area.



Map 6. Access limitations identified within the Slocan Fire Protection Area.



Map 7. Hazardous fuel types that are a priority for treatment.