

Community Wildfire Resiliency Plan



Town of Oliver

October 1, 2024

Submitted by:

B.A. Blackwell & Associates Ltd.
270 – 18 Gostick Place
North Vancouver, BC, V7M 3G3
Ph: 604-986-8346
Email: bablackwell@bablackwell.com



Submitted to:

Kai Kaplan
FireSmart Coordinator
Town of Oliver
Ph: 250-485-6256
Email: firesmart@oliver.ca



SIGNATURES

RPF PRINTED NAME	
Quentin Schmidt	RPF #5499
DATE SIGNED	
September 26, 2024	
I certify that the work described herein fulfills the standards expected of a member of the Association of British Columbia Forest Professionals and that I did personally supervise the work.	
Registered Professional Forester Signature and Seal	
	

ACKNOWLEDGEMENTS

The authors would like to thank Kai Kaplan (FireSmart Coordinator, Town of Oliver) for their direct involvement with planning, reviewing, and contributing to the Town of Oliver's first Community Wildfire Resiliency Plan (CWRP). Kai Kaplan invested substantial time in meetings, answering questions, and reviewing and commenting on the contents of this document. The authors would also like to thank the following individuals for the helpful information and guidance that they provided throughout the CWRP's development process:

- Bob Graham; Fire Chief, Town of Oliver / Oliver and District Fire Department
- Joseph Trottier; Civil Engineering Technician (GIS), Town of Oliver
- Wayne Anderson; Chief Administrative Officer, Town of Oliver
- Dan Macmaster; Head of Forestry, Nk'Mip Forestry LLP / Osoyoos Indian Band
- Peter Flett; Head of Forest Operations, Nk'Mip Forestry LLP / Osoyoos Indian Band
- Kevin Parkinson; Wildfire Officer, BC Wildfire Service
- Brent Lipinski; Land and Resource Specialist, Ministry of Forests

In addition, the authors would like to thank the number of municipal staff with the Town of Oliver who provided valuable information to this report.

This CWRP was funded through the Union of British Columbia Municipalities (UBCM) Community Resiliency Investment (CRI) program.

EXECUTIVE SUMMARY

The Community Wildfire Resiliency Plan (CWRP) process (evolving from the Community Wildfire Protection Plan – CWPP) was created in British Columbia as a response to the devastating 2003 wildfire in Kelowna. CWRPs aim to develop strategic recommendations to assist communities in improving safety and reducing the risk of damage to property and critical infrastructure from wildfires. Recommendations contained within a CWRP are based on the seven FireSmart™ disciplines (Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management).¹

This is the first CWRP created for the Town of Oliver, which builds off of ideas presented in the Town's 2016 CWPP. The area of interest (AOI) for this CWRP represents a 1-kilometer buffer from Oliver's municipal boundaries. This CWRP provides the Town of Oliver with an action plan that can be used to guide FireSmart collaboration between Oliver and adjacent jurisdictions, improve emergency response and FireSmart communication and education programs, guide law or policy development in areas of fire risk, and manage hazardous vegetation in the Wildland Urban Interface (WUI).

Fieldwork for this project allowed for wildfire threat assessments and the verification and updating of fuel types to be combined with a spatial analysis to update the local wildfire threat for the AOI. Private land covers approximately 42% of the AOI for this CWRP and was not able to be quantitatively assessed, therefore the wildfire threat analysis was performed on the remaining 58% of the AOI. The result of the analysis shows that a considerable proportion of assessable area within the AOI has a 'High' or 'Extreme' threat (30% and 14% respectively), while 9% has a 'Moderate' threat. The remainder of the AOI either has a 'Low' threat or contains water – though these areas often contain infrastructure-based values at risk. On private land or in developed areas, it was frequently observed that the fire hazard was much higher than in the surrounding vegetated areas. This is often due to accumulations of combustible materials (e.g., firewood, debris), highly flammable landscaping, and/or a structure that is vulnerable to fire (e.g., wood/vinyl siding, exposed wooden decks, etc.).

While much of the valley-bottom in and surrounding the Town of Oliver is irrigated and actively worked as orchards or vineyards, portions of the community have residential homes and/or community assets situated adjacent to unmaintained shrubland. There is a large amount of variability in the ecosystems and vegetation throughout the AOI, but areas containing dry and decadent shrub-steppe plant communities (e.g., sagebrush, antelope brush) present some of the fastest-spreading fuel types in British Columbia. Wildfire poses a threat to the community from a human or lightning ignition in the adjacent forest / shrubland, and also from a structure fire or vehicle fire that then spreads into surrounding vegetation, landscaping, or through combustible materials. With a considerable amount of industrial activity in the area surrounding the AOI and the popularity of the South Okanagan for recreation and seasonal tourism, the chance of a human ignition is heightened. Given the pre-existing

¹ FireSmart, Intelli-feu and other associated Marks are trademarks of the Canadian Interagency Forest Fire Centre (CIFFC).

network of roads and trails and the gentle topography throughout this part of the Okanagan valley, effective emergency response via land or air is possible.

The key to reducing structure loss due to a WUI fire is to reduce the ignitability of individual structures. Therefore, FireSmart activities on and surrounding homes, critical infrastructure, and community assets is a top recommendation in this plan (with a focus on a values-out approach, *i.e.*, starting with activities on the structure itself and the area immediately adjacent and continuing outwards). Mitigation should be centered on construction practices and regulations, vegetation management around structures, and resident education. Community outreach on the range of available activities and the prioritization of activities should help residents to feel empowered to complete simple risk reduction activities on their property.

A total of 36 recommendation and action items are presented in Table 1 within this Executive Summary and are more thoroughly discussed in their appropriate sections within the plan. Because much of the WUI surrounding the Town of Oliver is privately held within the administrative boundaries of the Regional District of Okanagan-Similkameen or Osoyoos Indian Band, or publicly held and managed by the Ministry of Forests, Oliver's role may be limited to an advocate or influencer in some instances. Ultimately, the recommendations and action items within this plan should be considered as a toolbox of options to help reduce the wildfire risk and consequence to Oliver, and increase the resilience of the Town to the impacts of wildfire. The Town of Oliver will have to further prioritize implementation based on resources, strengths, constraints, and availability of funding, and regularly update the prioritization and course of actions as variables change through time.

Table 1: The Town of Oliver's CWRP Action Plan

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)	(FireSmart Roadmap Phase)		
Education - Section 5.1							
<i>Objective: To provide information to Oliver residents and visitors empowering them to adopt and conduct FireSmart practices to mitigate the negative impacts of wildfire to their homes, businesses, and communities.</i>							
#1 Host FireSmart Workshops	High	Host annual FireSmart workshops and preparedness days throughout the community. Advocate for Oliver Fire-Rescue (OFD), Oliver's Emergency Program, and the BCWS to join and provide insight from first responder point of views.	FireSmart awareness in the community for local residents could use improvement. Workshops can cover basic FireSmart education and will reinforce the need to annually assess individual and community preparedness. Hosting community-wide events (and/or multiple events in different neighbourhoods) should increase the uptake of FireSmart activities. Oliver hosted a community preparedness day in 2024.	Oliver FireSmart Coordinator (OFD, BCWS)	Annually (Engagement / Initiative)	Annual hosting of at least one community FireSmart day focused on education and preparedness, and/or individual neighbourhood community events.	CRI funding is available: Wildfire Community Preparedness Day \$5,350 / event, cost maximums for physical materials (tents, T-shirts, decals, FireSmart Magnetic Board, etc.)
#2 Distribute FireSmart Materials	High	Distribute FireSmart homeowner materials (e.g., Homeowners Manual, "Tips to FireSmart Your Home" poster, FireSmart Landscaping Guide, FireSmart Begins at Home mobile app, FireSmart 101 & Wildfire Risk Reduction online course) throughout the community.	FireSmart BC homeowner materials provide helpful and easy-to-digest infographics on how a resident can reduce the hazard on their property. Materials can be provided at community events, posted online, and/or delivered individually.	Oliver FireSmart Coordinator	Distributed once (2024/25), subsequently available at annual events. (Engagement)	Delivery of the Homeowners Manual & Tips poster to all homeowners in the direct interface. Making these materials available at the Municipal hall, Fire hall, and future events and online. Link to online courses posted on the Oliver website.	Physical resources available at no cost (to a maximum amount) at https://firesmartbc.ca/resource-ordering-form CRI: Staff hours for administration
#3 Incorporate FireSmart in Schools	Med	Advocate for the use of FireSmart Education Materials at Oliver Elementary, Tuc-el-Nuit Elementary, and Southern Okanagan Alternative & Secondary.	1) Having FireSmart awareness instilled in youth may provide a catalyst for their parents to perform mitigation activities around their home. 2) Instilling FireSmart principles in today's youth provides the foundation for a FireSmart community in the future.	Oliver FireSmart Coordinator School District 53	Contact SD53 / individual principles in 2024 (Integration)	1) Communicate with SD53 / Principles 2) Have FireSmart materials worked into lesson plans	CRI: Staff hours for administration
#4 Communicate FireSmart & Fire Hazard Internally	High	Increase the use of social media, physical signage, and/or the Town of Oliver website to communicate FireSmart initiatives, fire hazard postings, and/or the planning / implementation of fuel management activities (including cultural burning and prescribed fire).	1) FireSmart / fire hazard information could be more easily accessible and readily displayed on the Town of Oliver website, and/or through various social media channels. This can target residents (as the Emergency Preparedness tab is currently under the "Visitors" tab on the Oliver website) and tourists – offering FireSmart / fire prevention information at the Visitors Center, Visit Oliver website, and approved accommodations. 2) Cultural burning and prescribed fire are important potential risk reduction / ecosystem restoration tools that can be utilized in the natural ecosystems surrounding Oliver. Increasing resident awareness and acceptance of these tools will be key for establishing and implementing a successful burning program.	Oliver FireSmart Coordinator (Communications Dept)	Work with the communications department in 2024, roll out information ASAP and/or in conjunction with FireSmart initiatives. (All Phases)	1) Use of social media channels to distribute information 2) Blatantly accessible fire hazard information online 3) FireSmart / prevention info. to tourism departments 4) Fuel management / burning information transmitted	CRI: Staff hours for administration, targeted education for fuel management, FireSmart education
#5 Communicate Fire Hazard Externally	Med	Work with the Ministry of Forests, BC Wildfire Service, local recreation groups, MOTI, and local news outlets (e.g., Times Chronicle) to expand the number of fire hazard postings in the interface, during periods of high and extreme fire danger.	Human-caused wildfires outnumber lightning-caused fires in the South Okanagan, and have been the cause of multiple interface fires in recent years. The population in the South Okanagan (residents and tourists) surges in the summer months which often coincides with extended periods of high and extreme fire danger. Having strategic communication methods to notify tourists and residents alike of fire danger ratings and prevention methods can increase people's situational awareness to wildfire and decrease the likelihood of human-caused fires.	Oliver FireSmart Coordinator / Communications Dept (MOF, BCWS, Oliver Tourism Association, MOTI, Times Chronicle, Radio)	Engage departments in 2024 – can be a regional approach. Roll out information ASAP and continue annually. (Engagement)	Use of various methods targeted at residents and tourists to communicate fire hazard or wildfire information.	Internal.
#6 Share the CWRP Publicly	Med-Low	Make this CWRP report and associated maps publicly available through the Town of Oliver website. Create an interactive web mapping tool to allow residents to locate their property and associated wildfire risk. Share this information with Osoyoos Indian Band, the Regional District of Okanagan-Similkameen, local industry partners, adjacent municipalities, and fire departments who may be interested in collaborating on FireSmart / wildfire risk reduction activities.	Notification to the community will allow Oliver residents to see the latest steps that the community is taking to become FireSmart. Working with local / regional partners and emergency response groups on achieving risk reduction goals can expedite the process.	Oliver FireSmart Coordinator	Shared in 2024 (Engagement)	CWRP and maps available for download or viewing on the Town of Oliver website.	Internal.
Legislation and Planning - Section 5.2							
<i>Objective: To provide the means for the Town of Oliver to implement wildfire risk reduction through laws and legislation by outlining government responsibilities regarding wildfire.</i>							
#7 Enact a FireSmart landscaping bylaw	High	Enact a FireSmart landscaping bylaw that prohibits the planting of highly flammable vegetation and prohibits the planting of vegetation in the FireSmart Immediate Zone (i.e., within 1.5 m of a building) wherever a Development Permit is required. ²	Highly flammable vegetation (arborvitae, juniper, conifer species) is commonly found throughout the Town of Oliver and was observed adjacent to homes in new residential developments. Landscaping choices have a large impact on the fire risk on and between properties.	Oliver Municipal Staff	Discuss in 2024, implement ASAP. (Integration)	Oliver has a legislative method to prevent the planting of highly flammable vegetation.	CRI: Development considerations – up to \$10,700 for bylaw amendments / revisions.

² Reference the FireSmart BC Landscaping Guide: <https://firesmartbc.ca/resource/landscaping-guide/>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)	(FireSmart Roadmap Phase)		
#8 Communicate bylaw controls of fire risk	Med	Educate community members on portions of the Fire Control Bylaw that relates to fire risk on properties (<i>Section 22 – Regulation of Fire Hazards</i>), and provide a clearer definition of combustible materials in this bylaw.	This portion of the Fire Control Bylaw prohibits the accumulation of combustible materials or “growth” around a premises – where this constitutes a fire hazard – though there is no definition of what is actually considered combustible. Increasing communication around this bylaw (potentially combined with FireSmart communication) and making language clearer on what material this bylaw targets can make things clearer for residents and improve voluntary compliance. Highly flammable vegetation (e.g., juniper bushes, bark mulch, cedar hedges) are extremely common on residential properties throughout Oliver, though this “Good Neighbour” bylaw has only been enforced for dead landscaping and trees to-date.	Oliver Municipal Staff (Oliver FireSmart Coordinator)	Begin in 2024, ongoing. (Engagement)	Education through public postings, Times Chronicle, and social media. Assess the amount of voluntary compliance to the Fire Control Bylaw, particularly as it relates to accumulations of combustible materials and/or vegetation. Measure and analyze the number of tickets issued, and look to achieve an annual decrease.	Internal.
#9 Manage public spaces proactively	Med	Work with Town departments (e.g., Oliver & District Recreation, Public Works) to ensure that FireSmart principles are embedded into the management of public spaces, and that all parks, recreation, and open spaces are maintained in a low-hazard state. Explore FireSmart BC’s Green Spaces Guide, Assessment, and vegetation management program for FireSmart activities on municipally-owned land.	Parks, recreation, and open spaces are found throughout the Town of Oliver and are highly trafficked areas during the peak of fire season. Oliver developed a Park Improvement Plan in 2015 which addresses the management of parks, and various recommendations from this plan likely contradict with FireSmart practices (e.g., reduced mowing and reduced irrigation of natural areas, reduced mowing on steep slopes). Oliver is currently developing a Recreation Master Plan which presents an opportunity to incorporate FireSmart considerations into the future management of these areas.	Oliver Municipal Staff (Oliver FireSmart Coordinator)	Begin in 2024, ongoing. (Engagement)	1) FireSmart considerations applied to the future management of parks, recreation, and open spaces throughout Oliver. 2) Explore the FireSmart for Green Spaces program through CRI, implement if appropriate.	Internal and CRI funding: \$850 per location for an assessment, \$25,000 per eligible location to complete mitigation activities.
#10 Update the CWRP	Low	Complete or schedule periodic updates of this CWRP. The frequency of updates is highly dependent upon major changes which would impact local wildfire risk or the rate at which wildfire risk reduction efforts are implemented. An evaluation of major changes (including funding program changes to may lead to new opportunities) and the potential need for a CWRP update should be initiated every 5 years.	An up-to-date (i.e., no more than five years old) CWRP is a current requirement for further funding under the CRI program.	Oliver FireSmart Coordinator	5 – 7 years from adopting this CWRP document. (Foundational Element)	Oliver always has an up-to-date CWRP and action plan.	CRI: ~\$32,000 for a full document, \$16,000 for an update.

Development Considerations – Section 5.3

Objective: To embed FireSmart practices and considerations into all development within the Town of Oliver.

#11 Enforce FireSmart Development	High	Embed FireSmart construction and landscaping principles into future development. This can be accomplished via the creation of a Development Permit Area (DPA) for wildfire hazards or through bylaws. A DPA or bylaws should strongly consider addressing: a) Fire-resistant roofing b) Fire-resistant siding c) A 1.5 m non-combustible Immediate Zone	Embedding FireSmart principles and the knowledge of qualified wildfire professionals into all aspects of community development and planning in interface areas is crucial to proactively building fire resilience. Multiple newer developments in the South Okanagan comply with FireSmart principles in many ways (e.g., hardie-board siding, fire-rated roofing) but this is not currently enforced nor is development in the interface subject to a wildfire hazard assessment by a qualified professional.	Oliver Municipal Staff (Consultant)	Ongoing. (Integration)	Wildland-Urban Interface DPA created and adopted – or bylaw creation / changes to ensure new community infrastructure and developments are FireSmart.	CRI: Development considerations - up to \$10,700 for various development consideration activities.
-----------------------------------	------	--	--	-------------------------------------	------------------------	---	--

Interagency Cooperation - Section 5.4

Objective: To broaden from a single-jurisdiction approach to a risk driven, multi-agency, multi-scalable approach to a wildfire emergency.

#12 Collaborate Externally	Med	Continue to discuss fire risk concerns and collaborate on FireSmart initiatives (including an integrated fuel management, cultural burning, and/or prescribed fire planning table) with like-minded agencies.	Creates opportunities for synergies and information sharing of wildfire risk reduction activities across jurisdictions. Having a functional Community FireSmart Resiliency Committee (CFRC), either internal or with like-minded external agencies, will be a requirement for accessing CRI funding in 2024 and beyond. The Town of Oliver currently sits on a regional CFRC-equivalent that spans the Okanagan valley, with a desire to have a more locally-focused south Okanagan working group.	Oliver FireSmart Coordinator (and participating partners)	Continue to engage with the regional Okanagan FireSmart group; start / join a sub-regional roundtable in 2024, meet bi-annually at least. (Engagement)	Meetings held and collaborative initiatives implemented.	Internal and CRI funding: Up to \$2,200 per meeting (for both CFRC & integrated fuel management tables)
#13 Collaborate Internally	Med	Continue to discuss fire risk concerns and FireSmart initiatives across municipal departments.	Fire risk concerns are often not shared and understood across different internal groups (i.e., land use planning, development services, emergency program, parks and recreation) which can lead to conflicting decisions. Mitigating fire risk proactively spans the knowledge of multiple departments and requires decision-making to be collaborative.	Oliver FireSmart Coordinator (and municipal departments)	Start a roundtable in 2024, meet bi-annually. (Engagement)	Meetings held and collaborative initiatives implemented.	Internal
#14 Push FireSmart Landscaping	Med	Engage local plant nurseries (e.g., Riverside Garden Center, Sagebrush Nurseries, Budget Nurseries) and contact local development / landscaping contractors to adopt the FireSmart BC Plant Program.	Highly flammable (i.e., non-FireSmart) landscaping is dominant throughout pre-existing residential areas in all parts of Oliver, and continues to be planted within new residential developments. In the absence of any legislation to restrict this, the FireSmart BC Plant Program can allow homeowners and developers to better understand how landscaping choices interact with fire hazard.	Oliver FireSmart Coordinator (Local nursery management)	Engage nurseries in 2024, establish program by spring 2025 and continue annually. (Integration)	1) Nurseries engaged 2) Program in place at least 1 local nursery	CRI: Up to \$2,500 per location

Cross Training & Fire Department Resources - Section 5.5

Objective: To expand the preparedness and qualifications of Oliver Fire-Rescue and municipal emergency staff.

Training

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)	(FireSmart Roadmap Phase)		
#15 Staffing FireSmart Positions	High	Continue to fund the FireSmart Coordinator position, and hire incremental FireSmart positions based on internal capacity and community need. Example positions include: -FireSmart Crew Member -Wildland Forest Professional (WFP) -Wildfire Mitigation Specialist (WMS)	The FireSmart Coordinator position in Oliver has allowed for a dedicated approach to be taken toward local FireSmart initiatives. This position is <i>required</i> for future CRI funding as of 2024. Specific needs for additional positions are as follows: -Crew Member: Perform mitigation work and assist in community events. -WFP: Oversee fuel management programs, collaborate, provide wildfire risk reduction advice. -WMS: Facilitation of the Home Partners Program – perform detailed WMS/HPP assessments and support the implementation of the FireSmart Rebate Program. A limited number of individuals in OFD (1) or the community have this training. Specific needs for the following positions are as follows: -WMS: Oversee HIZ / CI Assessments and mitigation work. More in-depth knowledge and assessment than an LFR, can establish the Home Partners Program. -LFR: Perform FireSmart Assessments, establish the Neighbourhood Recognition Program.	Oliver FireSmart Coordinator (Consultant)	Continue to fund a FireSmart Coordinator and hire other labour positions through 2024, expand annually as required. (Initiative)	1) Continue to fund the FireSmart Coordinator position. 2) Hire additional dedicated FireSmart staff based on community need and funding approach.	CRI funding available for FireSmart positions and for FireSmart training; LFR training is free (with funding available for staff time to attend the training)
#16 Expanding FireSmart Training	Med-High	Pursue expanded FireSmart training for Oliver Fire-Rescue staff / municipal staff: -Wildfire Mitigation Specialist (WMS) -Local FireSmart Representative (LFR)	Multiple individuals within OFD are currently trained in S-100, S-185, and WSPP-115, with additional training already planned. Continuing this trend will increase their experience and response capacity.	Oliver FireSmart Coordinator / Oliver Fire Rescue	Expand training in 2024 and beyond if necessary. (Initiative)	Expand and track the number of trained LFRs and/or WMS' in the community.	CRI: LFR training is free and virtual. WMS training is eligible for funding through a HPP workshop (\$6000 facilitation fee – up to \$8500 / workshop), with \$350 for annual HPP enrollment.
#17 Expanding Wildfire Training	Med-High	Continue to train Oliver Fire-Rescue staff in interface wildfire response. Courses include: Wildfire Risk Reduction Basics, WSPP-WFF1, S-231, WSPP-115, etc.	A limited number of individuals in the community have this training. Expanding internal ICS capacity will allow municipal officials to be more involved with and prepared for emergency response. Expanding FireSmart training for ESS staff will allow for greater knowledge and communication regarding fire prevention and risk reduction. Oliver's Emergency Program currently works with exempt municipal staff to identify training opportunities for management and their staff.	Oliver Fire Rescue	Formulate a training plan in 2024, continue annually. (Engagement)	1) Increase the number of trained individuals. 2) Have an individual as a "train the trainer" for WSPP-WFF1.	CRI: Training for fire department members, cost varies by course
#18 Expanding ICS Training	Med	Provide Incident Command System / Emergency Management training (e.g., ICS-100 / Intro to EOC) to municipal personnel most directly involved with managing or coordinating emergency response, and FireSmart training to Emergency Support Services (ESS) staff.	This activity can demonstrate to residents how they can make conditions easier for first responders to set up structure protection equipment.	Oliver Municipal Staff / Oliver FireSmart Coordinator	Ongoing. (Initiative)	1) All new exempt municipal staff members to have ICS-100 and/or Introduction to Emergency Management in Canada training within 24 months of employment. 2) All ESS staff to have FireSmart 101.	CRI funding available for ICS-100 training. UBCM Community Emergency Preparedness Fund available for EOC training.
#19 Demonstrating Structure Protection	Med	Host an annual structure protection demonstration in the community with Oliver Fire-Rescue, the BCWS, and/or trained community members. This can involve the clearing of combustible materials and setup of a sprinkler system. Could be combined with a Community Wildfire Preparedness Day.	Multiple fire departments throughout the South Okanagan have mutual aid agreements (OFD, Osoyoos Fire Department, Willowbrook Volunteer Fire Department) and have hosted live-fire drills in the past. Practicing these scenarios ahead of time will allow for a more seamless deployment of crews and equipment in an emergency scenario.	Oliver Fire-Rescue, BCWS	Host in 2025 during fire season – repeat annually. (Initiative)	Host an annual structure protection demonstration within Oliver.	CRI: Cross-jurisdictional meetings and/or tabletop exercises (\$2200 per meeting).
#20 Hosting Scenario-Based Training	High	Continue to host annual wildfire suppression and/or structure protection drills between Oliver Fire-Rescue, BC Wildfire Service crews, and/or mutual aid fire departments. Crews should familiarize and practice with each other's equipment and address any incompatibilities. Focus on communications capabilities and equipment compatibilities between response groups.	Outside of the Town boundaries, Oliver Fire-Rescue's Fire Protection Area does not have a consistent / reliable fire hydrant system in place and relies on water shuttling by Tender. OFD has stated that they have fairly sufficient water supply locally as well as through pre-identified natural lakes and rivers that they can draft from.	Oliver Fire-Rescue, BCWS (Osoyoos FD, Willowbrook Volunteer FD)	Host in 2025, practice annually. (Initiative)	Aim to hold one drill annually.	Internal / CRI: Cross-jurisdictional meetings and/or tabletop exercises (\$2200 per meeting).
Water							
#21 Increase Water Shuttling	Med-Low	Continue to increase the capacity for shuttling water to non-hydranted areas of Oliver Fire-Rescue's Fire Protection Area, including the transport of water to off-highway areas.	Oliver Fire-Rescue has obtained wildland firefighting gear for all members of the fire department, increased wildland training, acquired wildland-specific equipment, and built one complete Type II SPU and one partial SPU. Continuing to increase this allotment and ensuring that individuals are trained and practiced in its use will increase the efficacy of fire response throughout the wildland urban interface. The BCWS has had suppression success in the south Okanagan with burning off of fire guards / fuel breaks – therefore increasing the capacity of OFD to perform / support this tactic can be valuable.	Oliver Fire-Rescue	Ongoing Process (Expansion)	Increase from present – can be measured through an equipment inventory and/or grant money spent over five years.	Community Emergency Preparedness Fund: Volunteer and Composite Fire Departments Equipment and Training.
Equipment							
#22 Increase SPU Allotment	High	Continue to increase the capacity for wildfire mitigation work and wildfire suppression within the response area of Oliver Fire-Rescue, including but not limited to finalizing a second structure protection unit (SPU).	Oliver Fire-Rescue has obtained wildland firefighting gear for all members of the fire department, increased wildland training, acquired wildland-specific equipment, and built one complete Type II SPU and one partial SPU. Continuing to increase this allotment and ensuring that individuals are trained and practiced in its use will increase the efficacy of fire response throughout the wildland urban interface. The BCWS has had suppression success in the south Okanagan with burning off of fire guards / fuel breaks – therefore increasing the capacity of OFD to perform / support this tactic can be valuable.	Oliver Fire-Rescue	Ongoing Process (Expansion)	Increase from present – can be measured through numbers of trained staff, equipment inventory, and/or grant money spent over five years.	CRI: Assess, inventory, and purchase FireSmart structure protection equipment. Community Emergency Preparedness Fund: Volunteer and Composite Fire Departments Equipment and Training.

Emergency Planning - Section 5.6

Objective: To provide for a quick and effective wildfire response from Oliver Fire-Rescue and emergency management personnel through pre-incident planning and community preparedness.

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)	(FireSmart Roadmap Phase)		
#23 Distribute Evacuation Checklists	Med	Distribute FireSmart evacuation checklists in a coordinated fashion to individual properties in the community. Incentivize homeowners (e.g., with a door prize) if they create and/or annually review their home's evacuation plan and prepare a "ready-to-go" kit. Focus area can be for properties in the immediate interface (e.g., Rockcliffe Road, Spartan Street).	Proactively improving homeowners' evacuation preparedness is paramount to an efficient and effective evacuation – leaving the community with more time to focus on last minute hazard reduction and providing more peace-of-mind that their property is better protected and that their safety is provided for. Information in these checklists can also be used to guide proactive FireSmart measures at the residential scale.	Oliver Emergency Program / Oliver FireSmart Coordinator	Distribute checklists in the spring of 2025. (Engagement)	1) Distributing checklists to all homes in the immediate interface. 2) Increased participation in homes that develop/review an evacuation plan, and have "ready-to-go" kits prepared – tracked through competition entrants or similar.	Checklist available from FireSmart BC . Can use and promote through a Community Preparedness Day or in schools.
#24 Increase Voyent Alert Usage	Med	Expand awareness in the community for using the <i>Voyent Alert</i> app in order to receive real-time updates on emergency situations (including wildfires).	<i>Voyent Alert</i> provides a free, simple, and anonymous service to notify individuals with trusted and accurate information in the event of an emergency / evacuation.	Oliver FireSmart Coordinator / Oliver Fire-Rescue	Ongoing (Engagement)	Number of individuals utilizing <i>Voyent Alert</i> in the Town of Oliver and surrounding areas increases.	Internal
#25 Pre-Plan Incident Response	Med-Low	Create wildfire-specific incident plans and associated maps that can be discussed internally at Oliver Fire-Rescue and shared with the BCWS. Local fire threat, values at risk, access features and water sources should be included on any area maps.	Discussing a wildfire-specific incident plan ahead of time can support effective emergency planning and highlight where potential fire guards / control lines can and cannot be located – minimizing the risk of fire guards damaging any culturally or environmentally sensitive areas.	Oliver Fire-Rescue (BCWS)	5 Years. (Expansion)	Wildfire incident plans and associated maps created, available, and discussed.	Internal
#26 Address Wildfire Smoke	Med-High	Look into installing high efficiency particulate air (HEPA) filters in various community buildings (especially those designated as emergency operation centers and shelters) to provide clean-air spaces during smoke events. Additionally (or in the interim), have a supply of N95 masks that can be distributed to community members during smoke events, or research and communicate potential home-made solutions for affordable clean air filters.	There is a concern for the impacts of smoke on community health, and the community has a considerable proportion of potentially at-risk individuals (i.e., multiple retirement / senior living communities). Currently few community buildings have proper air filtration systems to provide spaces free from smoke particulate matter (PM _{2.5}). These clean-air spaces could be targeted at gathering buildings (e.g., community centers, reception centers, recreation buildings, neighbourhood-level common areas).	Oliver Municipal Staff	Discuss in 2024 – implement ASAP. (Integration)	1) Ensure that prioritized community buildings have HEPA (or equivalent) filters. 2) Have a supply of N95 masks to distribute to "high-risk" community members. 3) Communicate a program for "home-made" clean air filters.	Internal
#27 Procure Backup Generators	Med	Invest in backup generators for any Town critical infrastructure that does not have one. Prioritize structures noted as emergency operations centers, emergency shelters, evacuation reception centers, etc., and any infrastructure associated with emergency water delivery or communications. Encourage businesses that provide critical services such as gas stations and food stores to follow suit.	Backup generators for community buildings will facilitate both emergency response during a fire event, and community recovery (emergency support services) following a fire.	Oliver Emergency Program / Public Works	Ongoing (Expansion)	Major community buildings and critical infrastructure have a backup generator and fuel supply.	Cost varies.
Vegetation Management - Section 5.7							
<i>Objective: To reduce the potential wildfire intensity and ember exposure to people, structures, infrastructure, and other values through manipulation of both the natural and cultivated vegetation that is within the community.</i>							
Fuel Management Treatments							
#28 Plan Prescribed Burning	High	Undertake planning for fuel management on Oliver Mountain and the Fairview Road area, including the development of a fuel management prescription (FMP) to inform a prescribed / cultural fire burn plan. Three separate areas have been identified as priorities, which extend outside the CWRP area. Complete fuel management treatments (likely prescribed / cultural burning, but may include targeted grazing) within this fuel treatment area after approved prescriptions are in place.	The shrub-steppe and grassland ecosystems on Oliver Mountain are suited to be maintained by regularly occurring disturbances (i.e., fire), and considerable portions of this area have not experienced a fire since the 1960s resulting in a buildup of flammable vegetation. This is a notable concern for first responders and fire behaviour professionals, and can be managed through the routine application of prescribed / cultural fire, which will also promote ecosystem health. The fire hazard is considerably lower where recent wildfires have occurred in the area (i.e., 2015 & 2023).	Oliver FireSmart Coordinator / Ministry of Forests (BCWS, OFD, Osoyoos Indian Band)	Consult with the MoF in 2024/25 and have a fuel management prescription and burn plan completed ASAP, to be followed by treatment implementation. (Expansion)	1) FMP completed for the OliverMtn, GolfCourse, and Fairview area 2) Burn Plan completed for the three areas 3) Fuel management treatments (prescribed burns) completed in the three areas	MoF: Crown Land Wildfire Risk Reduction program CRI: FMPs, \$450/hectare (baseline); Burn Plans; Cultural / Prescribed Fire, \$3,750/hectare
#29 Address Invasive Species	Med-Low	Consult the Okanagan and Similkameen Invasive Species Society (OASISS) to identify and map occurrences of invasive grasses on municipal or public lands (e.g., cheatgrass, North Africa grass, etc.), and push for treatment and disposal of these species.	Cheatgrass is known to be extremely combustible and can result in an increased fire hazard where it occurs, in addition to reducing the quality of native habitat and biodiversity. Managing this species in municipal or public areas (especially where other fuel management programs are being pursued) will help to reduce the long-term fire hazard.	Oliver FireSmart Coordinator / Town of Oliver / OASISS	Consult in 2025, implement invasive species programs alongside fuel management. (Expansion)	1) Consult with OASISS and develop a system for managing occurrences of invasive grass species on municipal / public lands 2) Have invasive grasses targeted for treatment for the primary purpose of wildfire risk reduction	Internal / CRI: Incremental / Administrative costs
Residential FireSmart							
#30 Conduct HIZ Assessments	Med-High	Conduct HIZ Assessments or FireSmart Home Partners Program (HPP) Assessments for individual residential properties throughout the community. Consider a sign-up portal similar to that offered by the Regional District of Okanagan-Similkameen. ³	HIZ Assessments educate and inform residents as to their home's unique wildfire risks and hazards, and offer tailored recommendations on how those can be reduced. These assessments and the resulting mitigation work can be demonstrated on municipally-owned properties. Formal HIZ or HPP Assessments also provide the basis for a local rebate program.	Oliver FireSmart Coordinator	Continue in 2024, annually expand program. (Engagement)	1) Establish an online portal for homeowners to sign up for HIZ / HPP assessments 2) Track the number of assessments completed annually, seeking an annual increase	CRI: Conduct HIZ Assessments, \$250/structure; HPP Assessments, \$350/structure

³ RDOS FireSmart Program, including sign-up pages for Home Ignition Zone Assessments, Neighbourhood Assessments, and the FireSmart Rebate Program: <https://firesmart.rdos.bc.ca/>

Item	Priority	Recommendation	Rationale	Lead	Timeframe	Metric for Success	Funding Source / Est. Cost (\$) / Person Hours
				(Involved)	(FireSmart Roadmap Phase)		
#31 Establish FireSmart Neighbourhood Recognition	Med	Establish the FireSmart Canada Neighbourhood Recognition Program, beginning with performing Neighbourhood Assessments and creating Neighbourhood Plans for various communities. Prioritize neighbourhoods that are adjacent to higher-hazard wildland areas (e.g., west of Highway 97 / Fairview Road) and ensure that a Community Champion is identified for each neighbourhood.	Neighbourhood assessments and plans allow for coordinated neighbourhood-level mitigation activities to occur. Fire hazards within the Home Ignition Zone are often shared / overlapping between property owners which can limit a home-by-home approach.	Oliver FireSmart Coordinator	Engage communities and perform assessments / plans in 2025, expand annually. (Initiative)	Identify Community Champions and perform Neighbourhood Assessments and Plans	CRI: Neighbourhood Wildfire Hazard Assessments (\$450/neighbourhood); FireSmart Neighbourhood Plans (\$1,100/neighbourhood)
#32 Establish FireSmart Rebates	Med	Establish the FireSmart Rebate Program – providing rebates (for up to 50% of the total cost of eligible activities) to residents that complete mitigation activities that have been recommended through a Home Ignition Zone / Home Partners Program assessment.	Individual homeowners or strata owners may be more inclined to perform mitigation activities if they can have a portion of their time / materials compensated. Additionally, this ensures that the activities performed are in-line with recommendations that were provided by trained personnel.	Oliver FireSmart Coordinator	Establish the Rebate Program in 2025, expand the uptake annually. (Initiative)	Establish the Rebate Program, track the number of issued rebates and the type of activities that they correspond to.	CRI: Rebates limited to 50% of the total cost of eligible activities, up to \$5,000/property
#33 Assist with FireSmart Work	Med	Complete recommended FireSmart mitigation activities for seniors (65+), people with limited mobility, vulnerable populations, etc., who are unable to undertake these activities themselves.	FireSmart mitigation activities often require reasonably onerous physical labour (tree / plant removal, pruning, deadfall cleanup, etc.) and may not be able to be performed by certain populations within the Town of Oliver. Data from the 2021 Census states that 37.4% of the population in Oliver is over the age of 65, many of which are in retirement-living neighbourhoods where mitigation activities could be completed at the neighbourhood level.	Oliver FireSmart Coordinator (FireSmart Labourer)	Offer this service in conjunction with HIZ / HPP assessments in 2025, continue annually. (Expansion)	Track the number of hours, number of properties with work completed, and the type of work completed.	CRI: Limited to labour costs
#34 Assist with Debris Disposal	Med-High	Continue to work towards launching weekly yard waste pickup and expand awareness of and the number of events for the Town of Oliver's chipping program and unlimited yard waste program, to continue making debris disposal (of combustible vegetation) easier for residents. Potentially establish a program in priority neighbourhoods to provide debris bins to deal with combustible materials and/or vegetation.	"Unlimited yard waste days" are hosted by the Town of Oliver multiple times throughout the year and "Town chipping services" are offered once a year – providing easy and effective avenues for homeowners to dispose of non-FireSmart vegetation from their properties. These programs have had good uptake from residents in the past, and are excellent avenues to have flammable vegetation removed from properties. For vegetation hazards on properties, the logistics (e.g., physical work required, cost, desire to burn the material) of removing shrubs and trees that are cut on a property often make it prohibitive to the homeowner.	Town of Oliver Public Works / Oliver FireSmart Coordinator (Oliver Landfill)	Ongoing – expand program as uptake increases. (Expansion)	1) Tie pre-existing vegetation programs to the FireSmart program 2) Track the annual uptake of various programs and expand annually	Internal or through CRI: Off-site vegetative debris disposal
Critical Infrastructure & Community Assets							
#35 Conduct Critical Infrastructure Assessments	Med	Conduct Critical Infrastructure (CI) Assessments or Home Partners Assessments and follow-up mitigation work for municipally owned Critical Infrastructure or Community Assets (see Table 6 – Section 3.2.5) that have blatant structural vulnerabilities or are adjacent to unmaintained vegetation.	CI and Community Assets provide important services for emergency response, day-to-day community activities and employment services. Assessments allow for mitigation efforts to be effectively tailored to the individual buildings, making community infrastructure more resilient. Assessments provide the basis for CRI funding for follow-up FireSmart mitigation treatments or material changes.	Oliver FireSmart Coordinator (Contractor)	Perform in 2025, ensure that all CI / community assets with vulnerabilities or next to vegetation are assessed by 2026. (Expansion)	Have all vulnerable community infrastructure assessed.	CRI: Up to \$850/structure for assessments of both Critical Infrastructure and Community Assets.
#36 Mitigate Critical Infrastructure Hazards	Med	Perform recommended mitigation activities on Critical Infrastructure (CI) and Community Assets that have already had CI Assessments completed. Prioritize work by the hazard type, while also weighing objectively based on the importance of the asset.			Perform recommended mitigation activities ASAP after assessments are completed. (Expansion)	Have material upgrades or vegetation treatments completed on all vulnerable assets by 2026.	CRI: Up to \$53,500 per structure, including building materials and labour.

TABLE OF CONTENTS

Signatures	I
Acknowledgements.....	II
Executive Summary.....	III
Table of Contents.....	X
List of Tables	XII
List of Figures	XIII
List of Maps.....	XIV
Frequently Used Acronyms.....	XV
SECTION 1: Introduction	1
1.1 Plan Purpose and Goals.....	1
1.2 Plan Development Summary.....	2
SECTION 2: Relationship to Other Plans	3
2.1 Emergency Management Plan & HRVA.....	3
2.2 Linkages to Other CWPPs/CWRPs	4
2.2.1 Town of Oliver CWPP (2016).....	4
2.2.2 Osoyoos Indian Band CWPP (2023)	4
2.2.3 RDOS CWPP (2020)	5
2.3 Town of Oliver Official Community Plan	5
2.3.1 Oliver-Rural OCP	9
SECTION 3: Community Description	10
3.1 Area of Interest and Wildland-Urban Interface.....	11
3.2 Values at Risk.....	14
3.2.1 Emergency Response, Public Services, and Communications	14
3.2.2 Electrical Power.....	14
3.2.3 Water and Sewage	16
3.2.4 Historic and Cultural Values.....	20
3.2.5 High Environmental Values.....	20
3.2.6 Hazardous Values.....	23
SECTION 4: Wildfire Risk Assessment	24
4.1 Wildfire Environment	25
4.1.1 Fuel.....	25
4.1.2 Weather	29
4.1.3 Topography	31
4.2 Wildfire History.....	34

4.3	Risk Framework and Risk Class Maps	38
4.4	Local Wildfire Risk Assessment.....	40
4.4.1	Wildfire Threat Class Analysis	40
4.4.2	WUI Risk Class Analysis	42
SECTION 5:	FireSmart Disciplines.....	44
5.1	Education.....	46
5.2	Legislation and Planning.....	48
5.3	Development Considerations	51
5.4	Interagency Cooperation.....	53
5.5	Cross-Training & Fire Department Resources	55
5.6	Emergency Planning	57
5.7	Vegetation Management.....	60
5.7.1	Residential-Scale FireSmart	60
5.7.2	Fuel Management Treatments	62
SECTION 6:	FireSmart Roadmap and CWRP Action Plan	65
6.1	FireSmart Roadmap.....	65
6.2	Tracking, Reporting, and Updates	67
SECTION 7:	Appendices.....	i
7.1	Appendix A: Review of 2016 Oliver CWPP	i
7.1.1	Recommendations	i
7.2	Appendix B: Review of 2023 Osoyoos Indian Band CWPP	iii
7.2.1	Recommendations	iii
7.3	Appendix C: Review of 2020 RDOS CWPP	v
7.3.1	Recommendations	v
7.4	Appendix D: Local Wildfire Risk Process.....	i
7.4.1	Appendix D-1: Fuel Typing Methodology and Limitations.....	i
7.4.2	Appendix D-2: Wildfire Threat Assessment Plots	i
7.4.3	Appendix D-3: Wildfire Threat Spatial Analysis Methodology.....	i
7.4.4	Appendix D-4: Fire Spread Patterns.....	iv
7.4.5	Appendix D-5: Proximity of Fuel to the Community.....	v
7.5	Appendix E: Wildfire Risk Assessment – Worksheets and Photos	vii
7.6	Appendix F: Maps	vii
7.7	Appendix G: FireSmart Roadmap	i
7.8	Appendix H: Key Provincial and Federal Acts and Regulations	i
7.8.1	Linkages to Higher Level Plans and Legislation.....	i

LIST OF TABLES

Table 1: The Town of Oliver’s CWRP Action Plan	V
Table 2: Review of key policies from the Town of Oliver’s OCP (paraphrased) as they relate to the CWRP.	7
Table 3: Proportion of land ownership types within the Area of Interest (Data sourced from Parcel Fabric).	13
Table 4: Critical Infrastructure and cultural values within the AOI.	17
Table 5: List of ecological communities and species-at-risk as per the BC Conservation Data Center. Occurrences that are also federally listed with critical habitat locations in the AOI are given an asterisk.	21
Table 6: Updated fuel types (by area and percent) within the AOI. Remainder of the AOI not shown is private land or on OIB #1 – covering 1678 hectares.....	27
Table 7: Slope Class and Fire Behaviour Implications for the Town of Oliver CWRP area.	31
Table 8: Slope Position of Value and Fire Behaviour Implications.....	32
Table 9: Summary of major fire events in the Oliver area since 2015.....	35
Table 10: Wildfire threat summary for the AOI.	41
Table 11: Wildfire risk class analysis for the Town of Oliver’s Area of Interest.....	42
Table 12: List of bylaws within the Town of Oliver that relate to wildfire prevention and wildfire resilience.	49
Table 13: Potential agencies to be involved in a CFRC alongside the Town of Oliver.	53
Table 14: Example of a Wildfire Response Preparedness Condition Guide	59
Table 15: Fuel treatment units identified for prescribed burning regimes.	63
Table 16. Summary of the Town of Oliver’s progress along the FireSmart Roadmap.....	66
Table 17: Components of Fire Threat Analysis	ii
Table 18: Proximity to the Interface	vi
Table 19: Higher Level Plans and Relevant Legislation	i

LIST OF FIGURES

Figure 1: A graphic representation showing the connection between the Town of Oliver’s 2017 Official Community Plan / Regional Growth Strategy and basic ideas in the CWRP.	6
Figure 2: Examples of decadent shrub vegetation surrounding communications infrastructure (left) and grassy fuels on a Fortis right-of-way that run continuously into highly-flammable cedar / juniper hedges.	15
Figure 3: Examples of decadent vegetation surrounding a power pole that leads to water reservoirs on Oliver Mountain (left) and fire resistant (i.e., metal) lift station infrastructure that is adjacent to unmaintained and highly flammable hedges (right).....	16
Figure 4: Graphic display of the fire behavior triangle, and a subset of characteristics of each component	25
Figure 5: Average number of danger class days for the Penticton RS BCWS fire weather station.	29
Figure 6: Average number of danger class days for the McCuddy BCWS fire weather station.	29
Figure 7: Historical wildfire ignitions within a 5-kilometer buffer of the Oliver area, categorized by ignition cause and decade. Data from BCWS ignition dataset – Data BC.....	37
Figure 8: Historical cumulative area burned by wildfire within a 5-kilometer buffer of the Oliver municipal area. Data from the BCWS fire perimeter dataset - Data BC.....	37
Figure 9: FireSmart Home Ignition Zone	45
Figure 10: Example of conifer trees and hedges (all highly flammable vegetation) located throughout an interface neighbourhood.....	51
Figure 11: Examples of poorly maintained right-of-ways with accumulations of grass, shrub, and dead material (left, Bellevue Drive, mix of residential and Fortis right-of-way; right, pipeline and road right-of-way near Spillway Road).	54
Figure 12: Generalized description of the four phases of emergency response as they relate to a wildfire emergency in Oliver.	57
Figure 13: Examples of hazardous vegetation conditions on vacant private lots (top – dead shrub and grass material and dumped combustibles) and in municipal parks (bottom – dead shrub material and junipers on slopes in Rotary Park).	61
Figure 14. Graphic representation of the FireSmart Roadmap concept.	65
Figure 15: Example Wildfire Threat Assessment Plot from a characteristic high-hazard shrub-steppe ecosystem surrounding Oliver.	i
Figure 16: Initial Spread Index (ISI) roses depicting average daily wind speed and direction for each month during the fire season (April – October). Data taken from the McCuddy and Penticton RS weather stations (1996-2015).....	iv
Figure 17: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ).....	v
Figure 18: The ‘FireSmart Roadmap’ is a new focus of community wildfire planning in BC. Recommendations in this CWRP are listed by Roadmap phase.	i

LIST OF MAPS

Map 1: Overview map of the CWRP, displaying the study area (Area of Interest), the municipal boundary, and adjacent land ownership types. Areas within the AOI that do not have coloration are considered Crown Provincial.	12
Map 2: Critical Infrastructure and values at risk (i.e., structures) within the AOI (note, Highway 97 is not listed under Critical Infrastructure nor are the landfill, Black Sage, or Miller Road pumphouses in view).	19
Map 3: Display of red-listed and blue-listed species or ecosystems at risk, as well as critical habitat for federally listed species at risk.	22
Map 4: Updated fuel types present throughout Oliver’s CWRP area. “Private Land” includes the area within OIB #1 and has a minor discrepancy with the actual area of 1678 hectares due to overlapping polygons / inconsistencies in the Parcel Fabric dataset.	28
Map 5: Slope class map of the Area of Interest, displaying short, steep slope breaks within (and adjacent to) Town, and consistently steep conditions on Oliver Mountain.	33
Map 6: Natural disturbance regime and historical fire ignitions (1950 – 2022) and fire perimeters (2007 – 2023) within and adjacent to the Town of Oliver. Fire perimeters are only shown for fires larger than one hectare.	36
Map 7: Town of Oliver PSTA Fire Threat Rating and WUI Risk Class Rating	39
Map 8: Wildfire Threat Rating & Wildfire Risk Class Rating for the Town of Oliver’s CWRP area.	43
Map 9: Overview map of three Fuel Treatment Units identified for prescribed burning.	64

FREQUENTLY USED ACRONYMS

AOI	Area of Interest
BC	British Columbia
BCWS	British Columbia Wildfire Service
BEC	Biogeoclimatic Ecosystem Classification
CFFDRS	Canadian Forest Fire Danger Rating System
CFRC	Community FireSmart Resiliency Committee
CI	Critical Infrastructure
CRI	Community Resiliency Investment
CWPP	Community Wildfire Protection Plan
CWRP	Community Wildfire Resiliency Plan
DPA	Development Permit Area
EMP	Emergency Management Plan
FBP	Fire Behavior Prediction System
FCFS	FireSmart Community Funding and Supports
HIZ	Home Ignition Zone
HRVA	Hazard Risk and Vulnerability Analysis
MOF	Ministry of Forests
NCZ	Non-Combustible Zone
NDT	Natural Disturbance Type
OFD	Oliver and District Fire Department
OIB	Osoyoos Indian Band
PSTA	Provincial Strategic Threat Assessment
RDOS	Regional District of Okanagan-Similkameen
UBCM	Union of British Columbia Municipalities
VAR	Values at Risk
WRR	Wildfire Risk Reduction
WUI	Wildland Urban Interface

SECTION 1: INTRODUCTION

In January 2024, B.A. Blackwell and Associates Ltd. (Blackwell) was retained to assist the Town of Oliver in developing a Community Wildfire Resiliency Plan (CWRP). This CWRP is the second wildfire-related plan that Oliver has had developed, and it will make use of the seven FireSmart™ disciplines in order to guide the future resilience of the community in the face of an increasing wildfire threat. Recent wildfire disasters like those experienced in British Columbia (2017, 2018, 2021, 2023), Washington State (2014, 2015, 2023), Fort McMurray (2016), California (2017, 2018, 2020, 2021), and Colorado (2020, 2021) all display the vulnerability of communities and the potential toll of wildfires on families, neighbourhoods, public health, and the economy of entire regions. These events, along with important advances in loss prevention programs, have spurred the need for greater consideration and due diligence concerning fire risk in the wildland-urban interface (WUI).⁴ CWRPs are an invaluable resource for guiding communities to proactively manage wildfire risk and increase community resilience to wildfire.

1.1 PLAN PURPOSE AND GOALS

The purpose of this CWRP is to identify the level of wildfire risk to the Town of Oliver, to describe the potential consequences of wildfire to the community, and to examine options and strategies to reduce wildfire risks within Oliver's municipal boundaries and in its surrounding area. This CWRP gives Oliver a current and accurate understanding of the wildfire threats to human life, property, critical infrastructure, and ecosystems. The goal of this CWRP is for it to be used as an action plan to:

- 1) Reduce the potential impacts and losses to homes, community infrastructure and critical infrastructure, and/or the potential loss of life or injury to community members from an interface fire;
- 2) Increase the effectiveness of fire suppression and capacity for emergency response within the community;
- 3) Educate the community regarding wildfire risk and potential mitigation efforts, and reduce the health risks of wildfire smoke; and
- 4) Abate wildfire threats and promote healthy ecosystems within and surrounding the community.

⁴ The Wildland Urban Interface has been traditionally defined as where the structures are present in locations in which conditions result in their potential ignition from flames and/or firebrands/embers from a wildland fire (paraphrased from the National Fire Protection Association, NFPA), though the occurrence of urban conflagrations in Canada and the United States complicates this definition.

To help guide and accomplish the above goals, this CWRP will provide the Town of Oliver's emergency planners and land managers with:

- 1) An updated assessment of wildfire risk for the AOI;
- 2) An updated assessment of values at risk and potential consequences in the event of a wildfire;
- 3) An updated map of fuel types and recommended areas for wildfire risk reduction / ecosystem restoration treatments (e.g., prescribed burning);
- 4) An updated assessment of emergency response capacity and community FireSmart status; and
- 5) Options and strategies to reduce wildfire risk through the seven FireSmart disciplines: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management.

1.2 PLAN DEVELOPMENT SUMMARY

The Town of Oliver's CWRP development process consisted of four general phases:

- 1) Consultation with key Town representatives, structural and wildfire specialists, adjacent land managers, and various stakeholders.
- 2) Review of relevant plans and legislation related to wildfire risk, emergency response, community planning, and land use (Section 2).
- 3) Identification of the values at risk and an assessment of the local wildfire threat (Section 3 and Section 4), informed by fieldwork.
- 4) Development of an action plan with a focus on the seven FireSmart disciplines (Section 5).

SECTION 2: RELATIONSHIP TO OTHER PLANS

Wildfires can affect all aspects of a community. As a result, there are many plans from the Town of Oliver and neighbouring jurisdictions that relate to this CWRP. The intent of this section is to review multiple plans, laws, policies, and guidelines and identify sections within that are relevant to wildfire emergency planning and response.

2.1 EMERGENCY MANAGEMENT PLAN & HRVA

Calian Emergency Management Solutions finalized an Emergency Management Plan (EMP) for the Town of Oliver in 2022, which was an update to Oliver's 2006 Emergency Response & Recovery Plan. Oliver's EMP guides the operations, organization, responsibilities, and coordination necessary to provide for effective response and recovery from major emergencies or disasters in the Town. The EMP can primarily be used as a reference by the Town's emergency management staff when deciding how to effectively implement, support, and demobilize response operations when a disaster occurs that impacts the health, safety, and well-being of residents and property within the Town. The EMP applies to the jurisdictional boundaries of Oliver – while recognizing that emergency events (e.g., wildfires) will likely begin outside and progress towards Town.

The EMP takes an all-hazards approach to emergency management given the variety of natural disasters and hazards faced by Oliver – referencing a Hazard, Risk, and Vulnerability Assessment (HRVA) which was completed in 2017. The purpose of a HRVA is to help a community make risk-based choices to address vulnerabilities, mitigate hazards, and prepare for responding to and recovering from hazard events. Oliver's HRVA ranks various hazards based on their presumed rate of occurrence (i.e., every 1 – 3 years, every 4 – 10 years, etc.) and the potential consequence of these hazard events (i.e., low, moderate, high, and very high). Interface wildfires were rated as the highest risk hazard for Oliver (alongside debris avalanches and debris flows) – expected every 1 – 3 years with very high consequence. Urban and rural fires (i.e., excluding “interface fires”) were rated as high risk, expected every 1 – 3 years but with a lesser consequence. The information in this CWRP should help inform any future HRVA updates with respect to wildfire risk (Section 4.3 and 4.4), while the recommendations will provide options to reduce both the likelihood and potential consequence of interface fires.

In addition to the EMP, Oliver's Emergency Program Bylaw No. 1361 establishes the need for a municipal emergency management organization that develops and implements emergency plans and that provides a comprehensive management program to prepare for, respond to and recover from emergencies and disasters (see Table 12 for additional information on this bylaw).

2.2 LINKAGES TO OTHER CWPPS/CWRPS

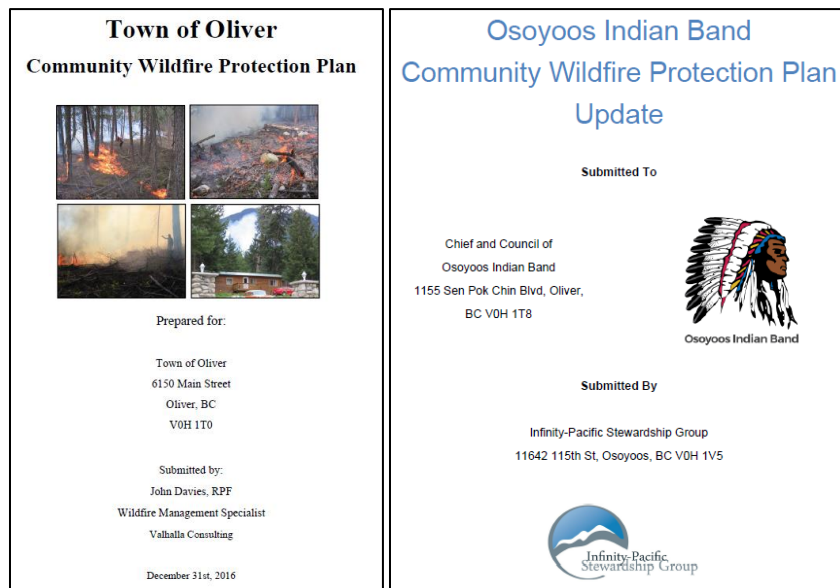
Multiple Community Wildfire Protection Plans (CWPPs) have been previously completed by the Town of Oliver and/or adjacent jurisdictions. While the scope of these plans often geographically overlaps, the implementation of these plans has largely been siloed to-date. The recommendations from this CWRP will look to align with and build off of the pre-existing CWPPs, where appropriate. Each adjacent CWPP will be summarized below, while Appendix A through Appendix C will detail the recommendations from each and provide a summary of their implementation or potential synergies with Oliver's CWRP.

2.2.1 TOWN OF OLIVER CWPP (2016)

Valhalla Consulting completed a CWPP for the Town of Oliver in 2016, which assessed a 2-kilometer buffer around the municipal boundary. The risk assessment for this 2016 CWPP involved modelling of potential fire behaviour, inclusion of theoretic ignition risk, an assessment of values at risk, and the identification of suppression constraints in various areas. Recommendations from the 2016 CWPP focused on reducing the fuel hazard in the WUI, minimizing the ignition potential of homes and developments through responsible development, and educating landowners on FireSmart guidelines. Two of the eight recommendations from this CWPP have been successfully implemented.

2.2.2 OSOYOOS INDIAN BAND CWPP (2023)

Infinity-Pacific Stewardship Group completed an updated CWPP for Osoyoos Indian Band (OIB) in 2023, which assessed the entirety of OIB's Reserve #1. The local wildfire threat assessment for OIB's CWPP involved a review of fuel types throughout the project area while incorporating the proximity of fuel to the community, local fire spread patterns, topographical considerations, and local factors. Recommendations from OIB's CWPP span the seven FireSmart disciplines and provide multiple opportunities for synergies with the Town of Oliver.



The revival and use of cultural burning / prescribed fire as a land management and risk reduction tool is a key recommendation in OIB's CWPP, along with improved FireSmart education for community members. Additionally, multiple fuel treatment units were proposed throughout OIB #1, targeting pockets of continuous conifers or sagebrush in areas that are adjacent to the community and/or along important access / egress routes. As the Oliver and District Fire Department (OFD) provides emergency and fire response to portions of OIB #1, collaboration to improve firefighter experience, safety, and efficacy on OIB #1 is crucial.

2.2.3 RDOS CWPP (2020)

Frontline Operations Group completed a CWPP for the Regional District of Okanagan Similkameen (RDOS) in 2020 which assessed the entirety of the RDOS. The area of interest for the RDOS CWPP appears to include the municipality of Oliver and all of OIB #1. Recommendations from this CWPP were spread across the seven FireSmart disciplines, including improved management of MOTI right-of-ways, improved emergency response capabilities, and ongoing support for fuel management programs and prescribed fire use. No recommended fuel treatment areas were identified in Electoral Area C (which surrounds the Town of Oliver). As the OFD provides emergency response and fire suppression to communities in the RDOS through mutual aid agreements (see Section 3.2.1 for additional detail), the expansion of firefighter experience, training, and capacity in the OFD will serve to also benefit the RDOS.

2.3 TOWN OF OLIVER OFFICIAL COMMUNITY PLAN

The Town of Oliver's Official Community Plan (OCP – Bylaw No. 1370) was adopted in 2017 and functions to guide the future growth of the Town, provide policy guidance for various municipal programs, provide a basis for land use decisions, and govern other various zonation / development decisions. Goals, objectives, and policy areas in Oliver's OCP are closely correlated with the South Okanagan Regional Growth Strategy (RGS) – which was collaboratively developed between the Town of Oliver, District of Summerland, Town of Osoyoos, City of Penticton, and the RDOS. Figure 1 below presents a subset of goals, objectives, and values from Oliver's OCP and RGS and provides an informal link to basic ideas from the CWRP.

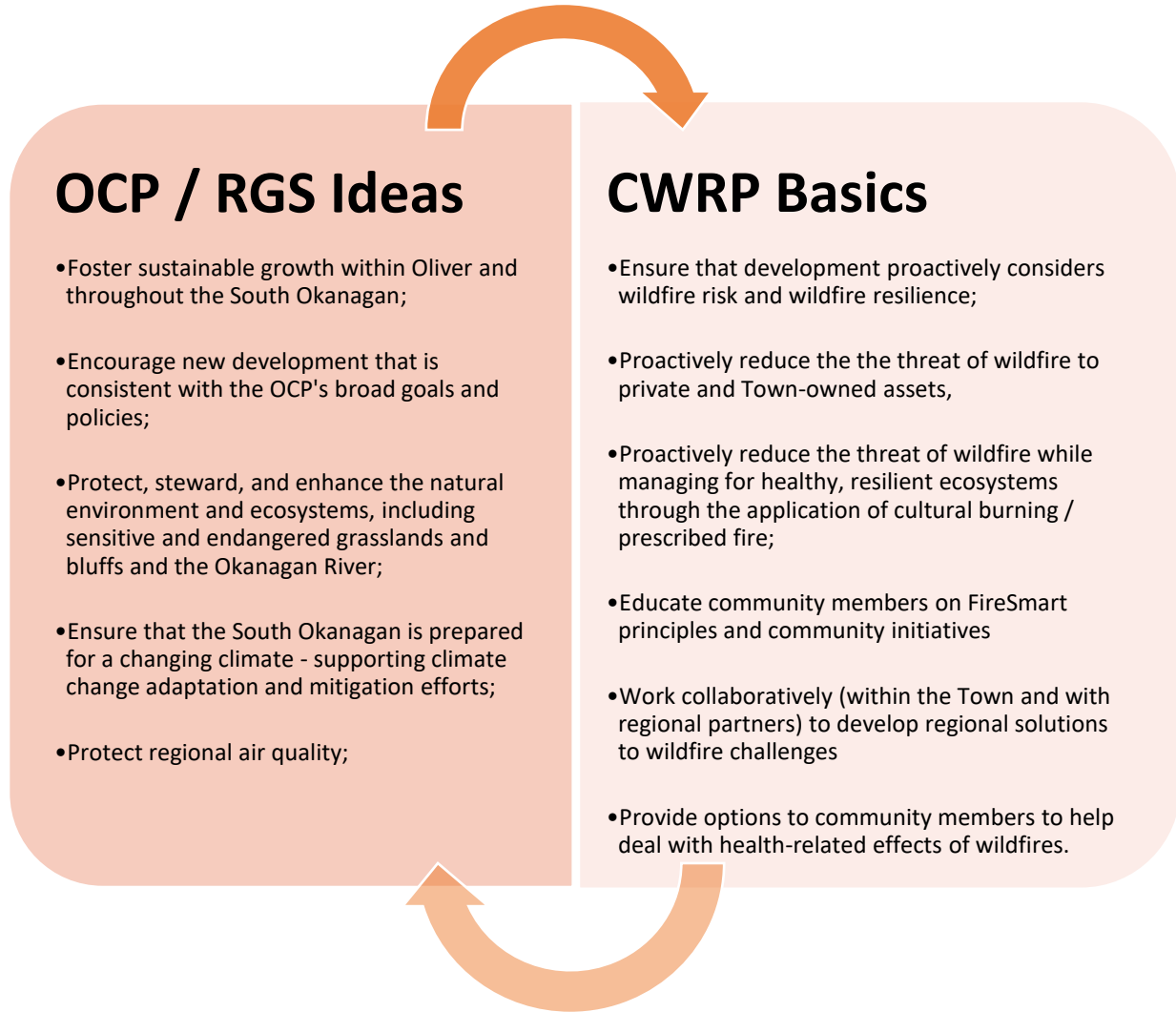


Figure 1: A graphic representation showing the connection between the Town of Oliver's 2017 Official Community Plan / Regional Growth Strategy and basic ideas in the CWRP.

Multiple policies from Oliver's OCP that are relevant to community wildfire resilience are discussed below in Table 2, while the remainder of relevant policies and legislation are presented in Section 5.2. The OCP has amendments to 2023, though the document states that it should be re-examined and updated every 7 – 10 years. The authors of Oliver's CWRP are hopeful and optimistic that information from this CWRP can be used to help guide relevant portions of the next OCP.

Table 2: Review of key policies from the Town of Oliver's OCP (paraphrased) as they relate to the CWRP.

Town of Oliver OCP Information / Policy	Description and <i>Relationship to CWRP</i>
Growth Management Policy 6.4.2	<p>States that the Town of Oliver directs development away from designated hazard lands (etc.). In addition to areas with slope stability or flooding concerns, Oliver's definition of hazard lands has previously also identified wildfire hazard areas. Schedule C of the OCP (Hazard Lands Map) displays all areas there were assigned a wildfire risk rating through the 2016 CWPP, but there is no further specificity of <u>where</u> this policy applies.</p> <ul style="list-style-type: none"> Reinforces the need to develop with FireSmart principles in mind and to avoid developing in overly hazardous areas. Reinforces the need to have a legitimate process in place for governing wildfire risk assessments and mitigation planning for new developments.
Residential Policies 8.2.5 & 8.2.6	<p>States that the Town of Oliver encourages developers to design and dedicate walkway systems to link residential areas and provide ready pedestrian access to parks and public open lands.</p> <ul style="list-style-type: none"> Walkways in the community were observed containing unkempt grass and shrub vegetation, often providing a "wick" of fire hazard between residential areas. Oliver should ensure that there is a dedicated plan for the maintenance of vegetation in these areas, and/or that they are not landscaped with highly flammable vegetation (i.e., maintained in a low fire-hazard state).
Low & High Density Residential Policies 8.4.4 & 8.5.6	<p>States that the Town of Oliver requires a high standard of architectural building design and landscaping in new developments.</p> <ul style="list-style-type: none"> Potential to incorporate FireSmart requirements for building design and landscaping.
Parks, Recreation & Open Space Objectives & Policies	<p>Objectives and policies are aimed to provide, improve, and maintain a variety of accessible parks, recreation, and open spaces. Supported the development of the <i>Park Improvement Plan</i> and supports the development of the Recreation Master Plan.</p> <ul style="list-style-type: none"> Does not contain information or requirements to ensure that these locations are maintained to reduce fire hazards. See Recommendation #9 in Table 1 of the Executive Summary.
Environment & Conservation Policy 15.2.2 & 15.2.6	<p>States that the Town of Oliver will retain "environmentally sensitive areas" in their natural state, and encourages conservation organizations to acquire or protect by covenant these lands.</p> <ul style="list-style-type: none"> Described in Section 4.1.1, the ecosystems in the lower elevation portions of the Okanagan Valley are historically adapted to and maintained by a frequently occurring, low-intensity fire regime. In the absence of these frequent disturbances (i.e., no prescribed fire / suppressing all fires), ecosystems will likely be pushed out of their historical structure which can result in damaging effects when they are impacted by a disturbance.
Environment & Conservation Policy 15.2.9	<p>States that the Town of Oliver does not allow open burning within its limits for safety and air quality reasons, with open burning permitted in the surrounding rural areas between October 15 and April 15.</p> <ul style="list-style-type: none"> This is a barrier to residential vegetation management. Need to continue offering and incentivizing debris / green waste removal programs for residents of Oliver. FireSmart vegetation management on residential / commercial / community properties will have much higher uptake if the removal process is easy.

Town of Oliver OCP Information / Policy	Description and <i>Relationship to CWRP</i>
Hazard Lands Objective 16.1.2 & 16.1.4 Policy 16.2.1, 16.2.5 & 16.2.12	Includes wildfire hazard areas in the definition of “Hazard Lands”, and states that the Town of Oliver will ensure that development does not occur in these areas unless the hazard has been sufficiently addressed and mitigated. Additionally, will reduce wildfire hazard threats to proposed new and existing developments in the wildfire interface area, and support investigating the feasibility of a Wildfire Development Permit Area. <ul style="list-style-type: none"> • <i>Schedule C – Hazard Lands Map – does not specify which areas are wildfire hazard areas, it only displays the hazard rating from the 2016 CWPP.</i> • <i>Currently no formal process or requirement by the Town of Oliver to sufficiently identify, address, and mitigate wildfire hazards for new developments.</i> • <i>No fuel management or hazard abatement treatments have occurred adjacent to existing developments in Oliver, nor does a formal process or requirement exist to reduce the threat to new developments.</i>
Hazard Lands Policy 16.2.10, 16.2.11, 16.2.13 & 16.2.14	States that the Town of Oliver will foster wildfire awareness through community education, review and update wildfire protection approaches, encourage property owners to adhere to FireSmart Guidelines, and pursue provincial funding and resources to undertake wildfire risk reduction in the WUI. <ul style="list-style-type: none"> • <i>The hiring of a FireSmart Coordinator in 2023 by the Town of Oliver has allowed these efforts to progress, but prior to this position being established there was little for a dedicated FireSmart program in Oliver. The development of this CWRP and the implementation of the recommendations within will continue to expand the program in Oliver.</i>
Infrastructure and Servicing Policy 18.2.20	States that the Town of Oliver will ensure an adequate water supply for fire protection exists within their Fire Protection Area. <ul style="list-style-type: none"> • <i>OFD has not noted any concerns with water supply throughout the FPA, either through hydrant systems (within Oliver) or by shuttling water by tender to rural areas.</i>
Development Permit Areas (DPA)	No DPA currently exists for hazard lands in the Town of Oliver, though professional assessments are required when a development is proposed in a flood-prone or steep-slope area. No professional assessments are currently required for development in wildfire hazard areas, nor is there a formal process for FireSmart development and/or required mitigation for wildfire hazards. <ul style="list-style-type: none"> • <i>Given the risk of wildfire in the Town of Oliver’s WUI (see Section 4.3 and 4.4), wildfire hazards and FireSmart considerations should be enforced for development and landscaping plans in Oliver. This process should involve a qualified individual where required.</i>

2.3.1 OLIVER-RURAL OCP

RDOS Electoral Area C (Oliver Rural) adopted an OCP in 2008 with amendments up to and including 2023. The RDOS OCP was not holistically reviewed as part of this CWRP, but there are takeaways from the document itself and recent proceedings which are relevant to wildfire resiliency in Oliver and the surrounding areas. The RDOS OCP defines “hazard lands” as areas that are subject to wildfire, and sets an objective of preventing development in hazard land areas unless the hazard has been sufficiently addressed. This objective also aims to prevent injury and loss of life, and to prevent or minimize property damage as a result of wildfire. The RDOS has enacted a policy that they *“May request that the Regional Subdivision Approving Authority require the developer to undertake a fire hazard risk assessment at the time of submitting a subdivision application where the province indicates that a property may be subject to a moderate or higher fire risk. The Regional Board may require the same assessment during the rezoning or development permit process.”* No examples of these completed assessments were available at the time of writing Oliver’s CWRP, and this process does not require an assessment to be completed by a qualified professional. See Section 5.3 for a further description of the RDOS’ attempts at enacting a Wildfire Development Permit Area in Electoral Area A.

SECTION 3: COMMUNITY DESCRIPTION

The Town of Oliver is located in the southern Okanagan Valley, positioned at the valley bottom approximately 20-kilometers north of the Canada-United States border. The Okanagan River, channelized in the 1950s, flows north-south and bisects the community with Tuc-el-nuit Lake positioned in the northeast corner of the municipality. Much of the economic activity within the Town and surrounding areas is driven by orchards and vineyards, which presents a considerable bubble of irrigation and humidity that transitions into the driest ecosystem type in British Columbia. The Town of Oliver is situated within the traditional territory of the Syilx Okanagan Nation and shares a present-day border of over 3-kilometers with Osoyoos Indian Band's (OIB) Reserve #1. OIB is a proud member community of the Syilx People and the Okanagan Nation Alliance (ONA). Due to the shared administrative boundaries between Oliver and OIB, OIB's traditional ecological knowledge, and the need for collaborative management of public lands, the authors of this CWRP are hopeful that the ideas within this CWRP can be discussed and implemented collaboratively, where possible.

The municipal boundary of the Town of Oliver encompasses approximately 589 hectares (5.9 km²), with undeveloped Crown land to the west and Agricultural Land Reserve (ALR) to the north and south. The Town carries a population of 5,094 people, which represents a 3.4% increase from 2016 (data in this section was obtained via Statistics Canada's 2021 Census Profile). This population increase has exceeded projections from the time that Oliver's OCP was created (which estimated a population of 4,831 by 2030). With approximately 51% of the community between the ages of 15 and 64, there are natural opportunities for FireSmart education and there is a reasonably able-bodied proportion of the community that can perform proactive fire risk reduction work. Approximately 37% of the community is over the age of 65 and retirement / seniors living complexes are common throughout the Town, which highlights the importance of developing programs and providing services to these older populations to assist with FireSmart work.

Despite the realized population increases and future growth projections, the Town of Oliver's growth containment boundary is not expected to increase. Ideally, the recommendations in this CWRP can be used to proactively guide land use, land management, and/or development decisions for the Town of Oliver where there is a threat of interface fire. Additionally, the areas in and around the Town see considerable increases in daily populations during the peak of fire season due to expanding opportunities for tourism in the summer months. The majority of tourists likely hail from areas with lower fire risk than the South Okanagan, therefore the average individual's awareness of fire hazards may be lower. An increase in summer visitation to the area results in:

- A) Increased likelihood of a human-caused wildfire;
- B) Increased consequence and/or complexity of a wildfire – more people to evacuate.

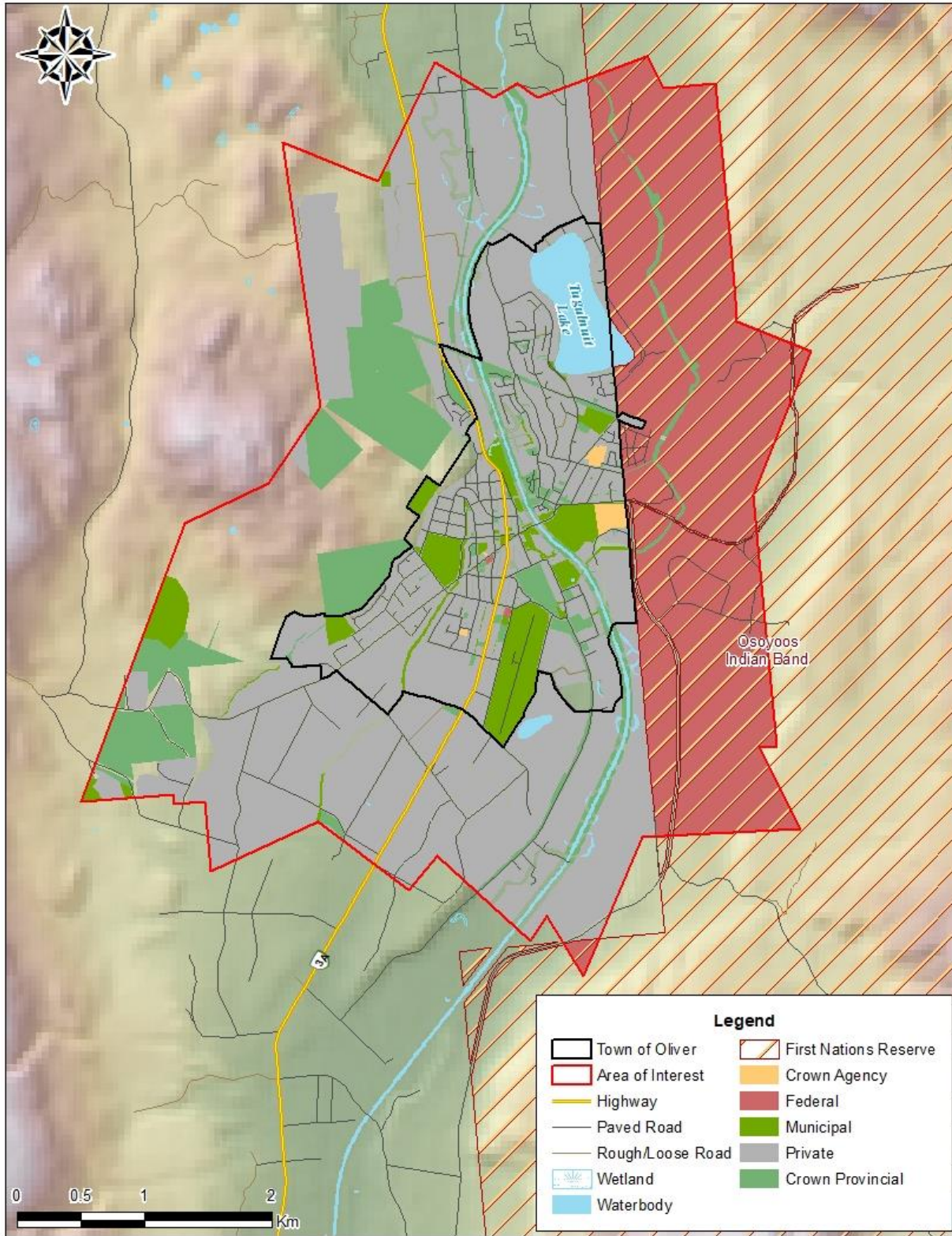
Fire protection services within the Town of Oliver are provided by the Oliver and District Fire Department (OFD), who also respond to communities along Highway 97 (north to Vaseux Lake and south to Osoyoos) and within OIB #1. The OFD also has mutual aid agreements with Fire Departments from Willowbrook, Osoyoos, and Okanagan Falls. For wildfire-specific response, the Town and surrounding areas fall within the Penticton Fire Zone of the Kamloops Fire Center. The nearest BC Wildfire Service (BCWS) Unit Crews are stationed in Princeton (approximately 1.5-hour travel time), Vernon and Merritt (approximately 2-hour travel time) – crew types which are generally reserved for responding to large, expanded wildfire events. While these crews can be highly effective in an expanding interface fire scenario, the availability of these crews for immediate response cannot be guaranteed as this is dictated by current wildfire activity throughout the province. This challenge was a reality in recent years (2018, 2019, 2021, and 2023), as the provincial wildfire situation overwhelmed available ground resources. The Penticton Fire Zone stations a number of smaller Initial Attack (IA) crews at the Penticton Airport.

3.1 AREA OF INTEREST AND WILDLAND-URBAN INTERFACE

The Area of Interest (AOI) for Oliver's CWRP generally covers the area within 1-kilometer of the administrative boundaries of the Town, which encompasses 2,518 hectares.⁵ As mentioned in Section 2.3, the Town of Oliver's Official Community Plan (OCP) provides Oliver the ability to govern land use and planning within their municipal boundaries but not within the entirety of the AOI, which stresses the need for collaboration while working to implement resilience initiatives. The majority of the AOI falls within the 'eligible' Wildland Urban Interface (WUI),⁶ which is the area in which Oliver is eligible to pursue provincial FireSmart funding through the FireSmart Community Funding and Supports (FCFS) program. Table 3 below displays the proportion of different land ownership types throughout the AOI. Additionally, Map 1 displays how large portions of the municipality are continuous with area under the jurisdiction of the RDOS (Electoral Area C – shown as Crown Provincial or having no coloration) or OIB. Successful wildfire resilience efforts will need to cross these jurisdictional boundaries.

⁵ The Area of Interest for this project was chosen by the Town of Oliver prior to a contract being awarded for the development of this CWRP. Alterations to this boundary were requested to administrative staff of the Community Resiliency Investment program, in order to include the area west to Fairview Road and align other edges with pre-existing roadways. This request and change had not been approved by the time of writing.

⁶ Defined through the FireSmart Community Funding & Supports program as a maximum one-kilometer buffer around any area with a structure density of 6+ structures per square kilometer.



Map 1: Overview map of the CWRP, displaying the study area (Area of Interest), the municipal boundary, and adjacent land ownership types. Areas within the AOI that do not have coloration are considered Crown Provincial.

Much of the AOI is privately owned (42%) which limits the amount of FireSmart work that can be accomplished directly by staff from the Town of Oliver. The Town can educate individuals that own private property regarding fire risk and FireSmart initiatives, and create programs that incentivize or make the uptake of FireSmart more feasible. Multiple observations were made throughout the Town where conditions were considerably more hazardous on private land than on the surrounding public land or municipal land, often due to landscaping or structural decisions. Parcels of municipal land are small and scattered throughout Oliver but often contain pieces of critical infrastructure or important community assets, which emphasizes the importance of regularly maintaining these areas in a low-hazard (i.e., FireSmart) state. Crown Provincial land to the west of Oliver contains undeveloped grass-shrubland, which presents a considerable fire hazard and has experienced numerous fires in recent years, while also containing a number of protected and sensitive ecosystems and habitat features. Hazard mitigation on public land adjacent to the Town will require a collaborative effort with the Ministry of Forests, OIB, and numerous stakeholders. Portions of OIB #1 also present a considerable fire hazard to the Town of Oliver due to vegetation conditions and overall adjacency, which reinforces the need for collaborative risk reduction efforts between Oliver and OIB.

Table 3: Proportion of land ownership types within the Area of Interest (Data sourced from Parcel Fabric).

Land Ownership Type	Area (Hectares)	Percent of AOI
Private	1067	42%
Crown Provincial	713	28%
Federal (OIB #1 Reserve)	611	24%
Municipal	99	4%
Crown Agency	7	< 1%
Unclassified	22	1%

In general, the majority of the community is located on relatively flat land at valley bottom adjacent to the Okanagan River and/or Tuc-el-nuit Lake. Much of the valley-bottom area to the north and south of Oliver is zoned as ALR and heavily irrigated to support orchards and vineyards. There are multiple industrial and commercial operations throughout the Town of Oliver, OIB #1, and the RDOS, which are mostly located near the Highway 97 corridor. As you look west from Highway 97 within the Town, many residential and agricultural areas transition into more sloped and vegetated hillsides. A more in-depth description of the forest types and topography throughout the AOI will be discussed in Sections 4.1.1 (Fuel) and 4.1.3 (Topography).

3.2 VALUES AT RISK

Multiple types of values can be either directly or indirectly impacted by a wildfire event. Publicly or municipally owned critical infrastructure is either identified through the Town of Oliver's Emergency Management Plan or HRVA, or is infrastructure that is essential to the health, safety, security or economic wellbeing of the community or for the effective functioning of government (e.g., fire halls, emergency operations centers, radio repeaters, cell towers, etc.). The Town of Oliver has developed various emergency management plans and preparations for critical infrastructure within their jurisdiction. For this CWRP, *values at risk* were defined to include critical infrastructure, community assets, residential structures, commercial / industrial structures, and areas with high environmental or cultural value. Critical infrastructure and values at risk for the Town of Oliver are shown on Map 2, while Table 4 details the inventory of critical infrastructure and community assets within the AOI. This list is likely incomplete or may change as the Town continues to grow, therefore pieces of infrastructure additional to those in Table 4 may be considered for FireSmart assessments or mitigation over time.

The distinguishing factor between Critical infrastructure and community assets is their function during a wildfire event. Protection of functional critical infrastructure through proactive risk mitigation and during a wildfire event is an important consideration for emergency response effectiveness, to ensure that coordinated evacuation can occur if necessary and that essential services can be maintained or restored quickly. The same efforts on community assets can ensure that the community is resilient to a fire event – preserving important municipal assets that provide for regular functioning of the Town.⁷

3.2.1 EMERGENCY RESPONSE, PUBLIC SERVICES, AND COMMUNICATIONS

In the event of an evacuation alert or order, the Town of Oliver is responsible for offering support services including reception centers, emergency operation centers (EOC), and evacuation means (as detailed in the EMP – see Section 2.1). The Town of Oliver's primary EOC is the Oliver and District Fire Department at 369 Similkameen Avenue, with the Community Center identified as a suitable alternate EOC if not used as the Emergency Support Services (ESS) Reception Center. The majority of day-to-day public services to community members are offered from multiple locations throughout town (many of which are identified as critical infrastructure / community assets in Table 4). There is reliable cellular and internet coverage at all of these locations and throughout the majority of the South Okanagan valley.

3.2.2 ELECTRICAL POWER

A large fire has the potential to impact electrical service by disrupting the network power distribution through both direct and indirect processes. For example, heat from flames or fallen trees associated with a fire event may cause power outages or electrical infrastructure may be directly damaged by fire. Electrical service throughout the Town of Oliver is provided by Fortis and the majority of this is distributed through a network of wood pole distribution lines. Major transmission lines pass north-south through the east side of the valley, with a large substation at the east end of Merlot Avenue and an

⁷ Activities that proactively assess and mitigate fire hazards around critical infrastructure and community assets are currently eligible for funding under the 2024 CRI Program Guide, which are addressed through recommendations #35 and #36.

additional one located to the immediate east on OIB #1. From the Merlot Avenue substation, a Fortis right-of-way crosses through the municipality to the northwest. The majority of this right-of-way contains non-fuel or a low-hazard deciduous fuel type, with pockets of drier grassy fuel types located between Bellevue Drive and Merlot Ave. This grassy area has been managed for ecosystem restoration purposes over time, though it does contain a flammable fuel type which backs onto private properties that were observed to have low FireSmart compliance.



Figure 2: Examples of decadent shrub vegetation surrounding communications infrastructure (left) and grassy fuels on a Fortis right-of-way that run continuously into highly-flammable cedar / juniper hedges.

In the event of a wildfire that may impact electrical infrastructure, Fortis will work with municipal and regional emergency personnel and employ their emergency response protocols. Utility right-of-way best management practices such as regular brushing and clearing of woody debris and shrubs are often employed within and adjacent to Town to help reduce fire risk, utility pole damage, and subsequent outages; though on residential lots, overgrown vegetation surrounding power poles was commonly noted. Multiple instances were also noted of a build-up of highly flammable vegetation adjacent to wooden power poles (natural or landscaped) that provide power to pieces of critical infrastructure. Poor vegetation management practices around any power poles can leave them susceptible to burning and collapsing in a fire.

Secondary power sources are important to reduce vulnerability in the event of an emergency that cuts power for days, or even weeks. This is especially important for any critical infrastructure used for emergency response (e.g., EOC buildings, evacuation centers, pumphouses etc.). The importance of reliable backup power is discussed in Recommendation 27 (Emergency Planning).

3.2.3 WATER AND SEWAGE

Potable water and emergency supply water for the Town of Oliver is part of a larger water system that services an extensive number of rural and agricultural properties throughout the valley. The municipal system within the Town is groundwater fed and relies on the Rockcliffe and Tuc-el-nuit pump stations and the two reservoirs on Oliver Mountain. Pumping and water storage infrastructure is largely constructed of non-combustible materials (i.e., brick, concrete, metal), but with electrical components that have the potential to be damaged by radiant heat or direct flame contact. Irrigation water throughout much of the valley is supplied via surface water (i.e., the Okanagan River), while irrigation on multiple municipal parcels (e.g., Oliver Cemetery, Oliver Airport, Town parks and South Okanagan Secondary School) is provided via reclaimed wastewater from the Fairview Road sewer treatment plant. The OFD has noted that they currently have sufficient water supply for fire suppression locally through this municipal system, as well as a reliable system of natural lakes and rivers to draft from in the event of a wildland fire. Recommendations relating to water supply as it relates to emergency response and fire suppression will be detailed in Section 5.5.

Similar to the domestic water infrastructure, lift stations throughout Town are largely constructed of non-combustible materials (i.e., metal, concrete) but still have the potential to be damaged by radiant heat or direct flame contact. Highly flammable landscaping or natural vegetation surrounds this infrastructure west of Park Avenue Estates and in Rockcliffe. Additionally, conditions were frequently observed on private properties adjacent to water and sewage infrastructure that have low FireSmart compliance.

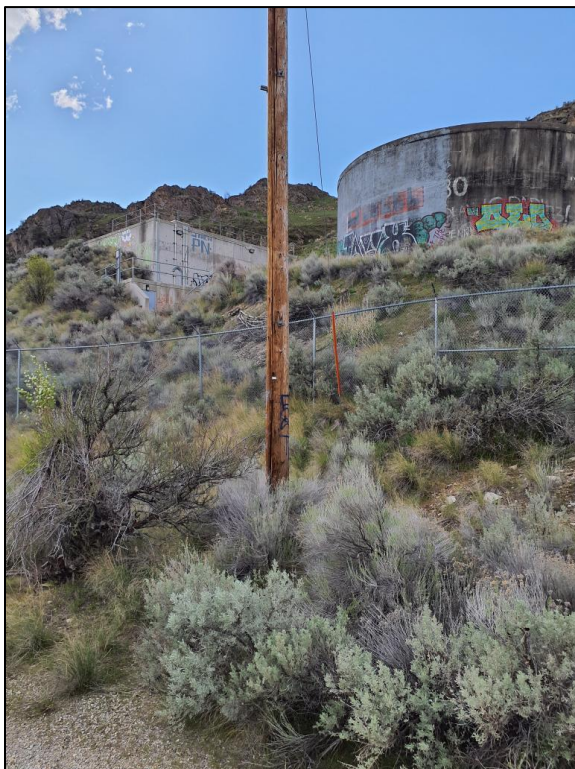


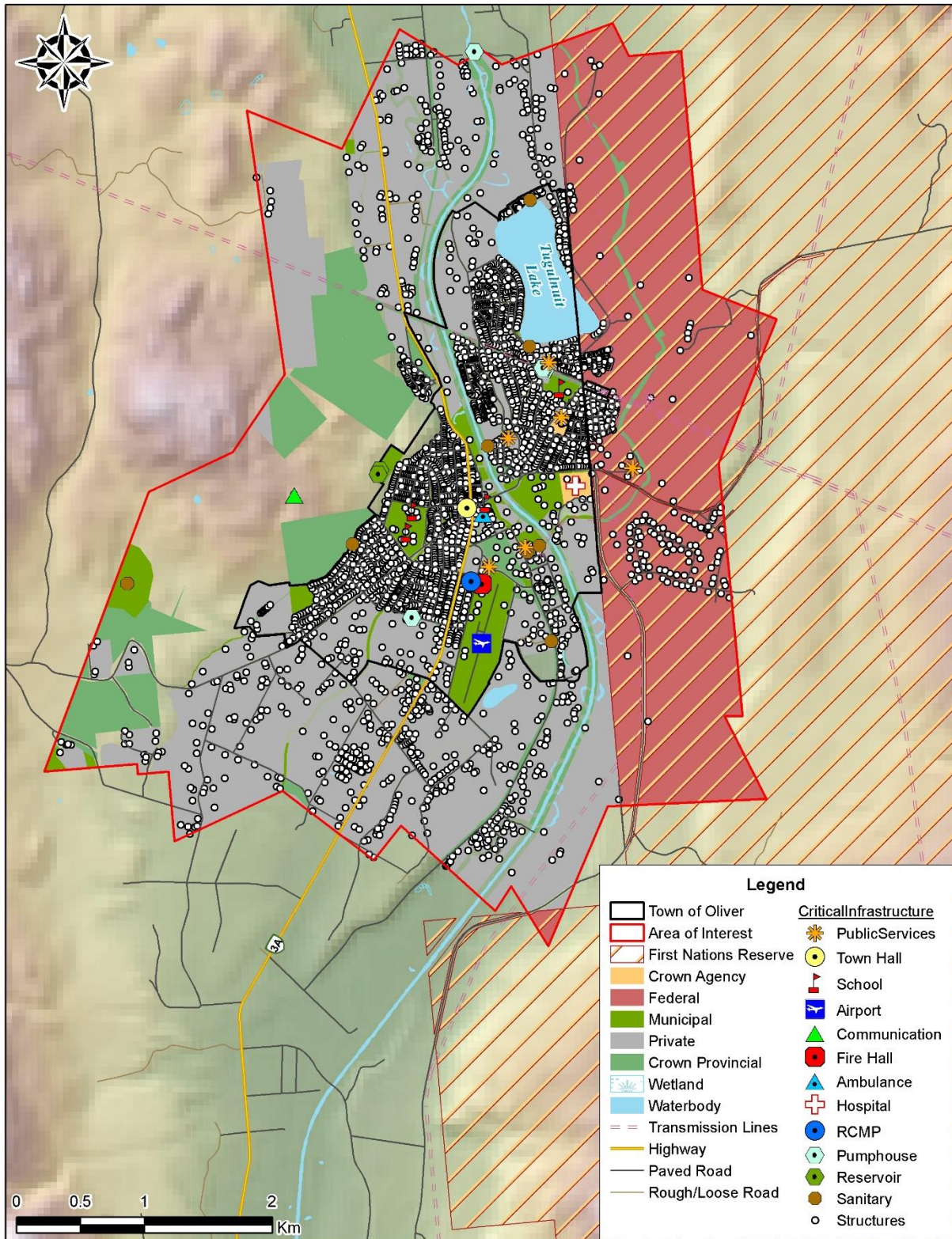
Figure 3: Examples of decadent vegetation surrounding a power pole that leads to water reservoirs on Oliver Mountain (left) and fire resistant (i.e., metal) lift station infrastructure that is adjacent to unmaintained and highly flammable hedges (right).

Table 4: Critical Infrastructure and cultural values within the AOI.⁸

Infrastructure Type	Infrastructure Name	Notes / Overview of Risk Factors
Emergency Response & Public Services		
Emergency Response	Fire Hall	Emergency Operations Center. Well maintained but surrounded by high-flammability landscaping.
	Town Hall	Emergency Operations Center. Well maintained property and FireSmart construction, low-flammability landscaping.
	Airport	Maintained and irrigated, low fuel hazard.
Public Services	BC Ambulance Service	Low hazard area, middle of Town.
	South Okanagan General Hospital & McKinney Place Extended Care	Well maintained property on average. Slopes on the west side of property are irregularly maintained and contain a moderate fuel hazard.
	Osoyoos Indian Band Health Center, Inkameep Pre-School & Sen'Pok'Chin School	Located on OIB #1, decadent sagebrush / grassland areas adjacent.
	Royal Canadian Mounted Police	Well maintained property.
	Oliver Elementary School	Large cleared areas with irrigated fields, majority of landscaping is low-flammability.
	South Okanagan Secondary School	
	Tuc-el-nuit Elementary School	
	Okanagan College	FireSmart structure, little to no vegetation surrounding.
	Cherished Belongings and Little Wonders Childcare	Well maintained property and FireSmart structure, conifer vegetation (mature and hedging) on property edges.
	Heritage House – Assisted living and senior care	Generally FireSmart structure, well-maintained but conifer vegetation on the property. Unmaintained private property parcels with considerable fire hazards to the south, west, and on slopes to the north/east.
	Sunnybank Retirement Center	Well maintained and irrigated property.
	Public Works Yard	Industrial and generally non-vegetated setting, lower-hazard deciduous vegetation to the east along the river dyke.
	Service BC Center	Commercial setting, conifer hedge landscaping and relatively unmaintained grass to the east.
Oliver Landfill	Adjacent to irrigated orchards / vineyards and shrub vegetation on OIB #1.	
Highway 97	Variable vegetation management throughout the corridor, but adjacent to multiple pockets of grass / shrubland.	

⁸ This list identifies critical infrastructure as per Oliver's Emergency Management Plan / HRVA. It is not exhaustive, and there are undoubtedly a large number of commercial and industrial buildings and sites within the Town that are important to the economic well-being of the community.

Infrastructure Type	Infrastructure Name	Notes / Overview of Risk Factors
Water Infrastructure		
Pumphouse	Buchanan Drive (west end)	Riparian area, low-hazard deciduous stands surrounding. Located outside of Town boundaries.
	Merlot Ave & Lakeside Drive (three pumphouses at location)	Few (if any) structural vulnerabilities. Property to south and east is naturalized and less maintained.
	Skagit Avenue / Columbia Street	Few structural vulnerabilities, no vegetation surrounding. Irrigated agricultural property adjacent.
	Black Sage and Miller Road	Few structural vulnerabilities. Adjacent to deciduous and shrub vegetation along the Okanagan River. Miller Road pump house is adjacent to a residential / agricultural property. Located outside of Town boundaries.
Reservoir	Oliver Mountain, west of Bing / Tilton Avenues (two reservoirs at location)	Concrete structures but vulnerable electrical components. Mid-slope, dense shrub vegetation surrounding, adjacent to homes, and adjacent to wood power poles. Lower fuel hazard in 2023 fire area.
Sewage Infrastructure		
Sewer Treatment Plant	Fairview Road	Open-air, aerated lagoons. Little above-ground infrastructure but surrounded by high hazard shrub-steppe areas.
Lift Station	Pine Ave / Sawmill Road (contains sewer treatment area as well)	Industrial area, little vegetation. Low hazard riparian / deciduous area to east.
	Desert Lake & Apple Beach RV Parks (Merganser Place)	Metal and concrete, private property (vegetation and structures) adjacent.
	Rotary Park / Lakeside Drive	Metal and concrete, no vegetation or structures surrounding.
	West of Park Avenue Estates	Metal structure, juniper hedge adjacent. Property north of Park Avenue Estates is unmaintained with accumulations of grass and dead shrub material.
	Rockcliffe – between Morningstar Road / Evening Star Crescent	Considerable landscaping on private properties adjacent and unburned shrub fuel on slope above.
	Maple Ave / Sawmill Road	Metal structures, unmaintained grass fuels surrounding.
Communications		
Cell Tower	Oliver Mountain	Cleared and low-hazard immediate zone, but dense shrub fuels in the intermediate and extended zones and adjacent to wood power poles.



Map 2: Critical Infrastructure and values at risk (i.e., structures) within the AOI (note, Highway 97 is not listed under Critical Infrastructure nor are the landfill, Black Sage, or Miller Road pumphouses in view).

3.2.4 HISTORIC AND CULTURAL VALUES

Provincial records indicate several historic sites and archaeological sites within the AOI and a considerable number adjacent to the AOI. As well, the Town of Oliver / Oliver & District Heritage Society proudly preserves and protects various heritage buildings. Heritage infrastructure is often built with traditional materials that are naturally vulnerable to fire (e.g., wood siding, cedar shakes), and they are often set adjacent to mature vegetation that directly presents fire hazards to the building. In addition to heritage features that are recognized by the Archaeological Branch and/or the Town of Oliver, there are many culturally sensitive / important sites held by OIB throughout the region. The use of fire by OIB is an important cultural, spiritual, and land management tool and they are hopeful to retain this important tradition. Any future fuel management prescriptions and/or fuel management activities within or adjacent to the AOI should identify and mitigate potential impacts to any cultural values that are identified in consultation with OIB (see Section 5.7 – Vegetation Management).

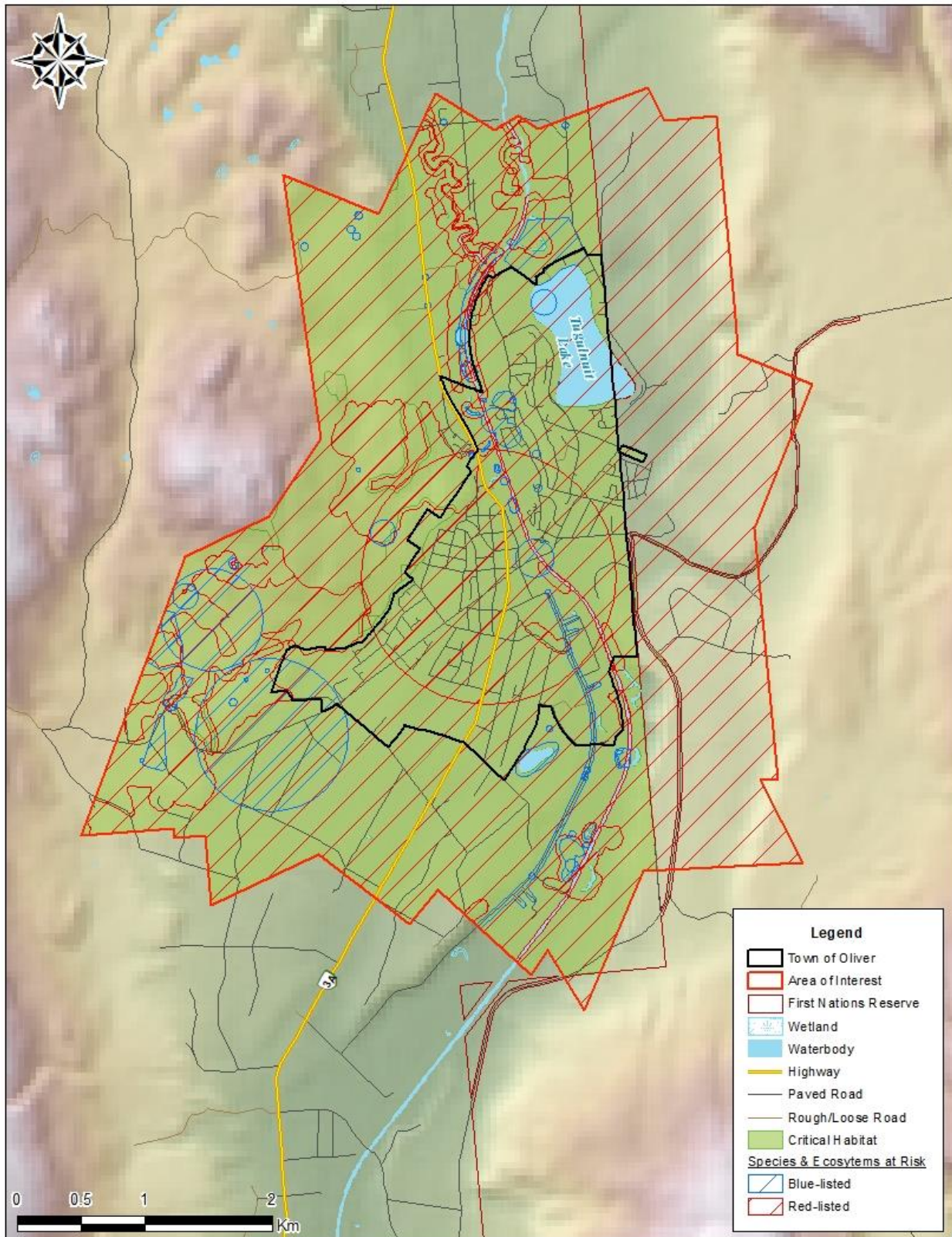
3.2.5 HIGH ENVIRONMENTAL VALUES

The Town of Oliver is located within the most endangered natural ecosystem in British Columbia – an area which supports a high concentration of species diversity and is home to a considerable number of plant communities and critical habitat that are either listed provincially or federally as species or ecosystems at risk. Much of the pre-development valley-bottom natural ecosystems in the South Okanagan have been lost as a result of development, disturbance, and/or the establishment of agriculture in the region. These ecosystems have historically been adapted to and maintained by frequent natural disturbances (i.e., fire), therefore the re-introduction of fire into areas that have not had a disturbance in multiple decades is an important ecosystem restoration tool.

Table 5 lists the red-listed ecosystems and species-at-risk occurrences that overlap the AOI as identified through the BC Conservation Data Center (CDC), as well as any finalized critical habitat for federally listed species-at-risk. Map 3 visually displays how the entirety of the AOI is protected for species at risk. A blue-listed designation applies to an ecosystem or species that is of special concern due to vulnerabilities to natural or human disturbances, while a red-listed designation is for a species or ecosystem that is at risk of being lost (i.e., extirpated, endangered, or threatened). The entirety of the AOI also overlaps with one additional masked-secured species at risk; however, the location and/or any additional information is sensitive and therefore not releasable to the public. Any fuel management or cultural / prescribed burning activities within or adjacent to the AOI should identify and mitigate potential impacts to any environmental values that have previously been identified, or are additionally identified in consultation with Osoyoos Indian Band or the Ministry of Forests.

Table 5: List of ecological communities and species-at-risk as per the BC Conservation Data Center. Occurrences that are also federally listed with critical habitat locations in the AOI are given an asterisk.

Type of Ecosystem or Species at Risk	Description and Approximate Location
Western Tiger Salamander* <i>Ambystoma mavortium</i>	<ul style="list-style-type: none"> Red-listed species at risk, three separate occurrences throughout the AOI; Habitat associated with ponds (natural and artificial), creeks, and riparian suburban areas.
Big Sagebrush / Bluebunch Wheatgrass <i>Artemisia tridentata</i> / <i>Pseudoroegneria spicata</i>	<ul style="list-style-type: none"> Red-listed ecological communities, multiple occurrences throughout the AOI; Presents a considerable fire hazard when overgrown.
Antelope-brush / Needle-and-Thread Grass <i>Purshia tridentata</i> / <i>Hesperostipa comata</i>	
Water Birch / Roses <i>Betula occidentalis</i> / <i>Rosa spp.</i>	<ul style="list-style-type: none"> Red-listed ecological community, multiple occurrences throughout the AOI.
Dark Saltflat Tiger Beetle <i>Cicindela parowana</i>	<ul style="list-style-type: none"> Red-listed invertebrate animal, associated with grasslands, croplands, orchards, and riparian areas.
Small-Flowered Lipocarpa <i>Cyperus subsquarrosus</i>	<ul style="list-style-type: none"> Red-listed vascular plant, associated with grassland plant communities.
Rocky Mountain Ridged Mussel <i>Gonidea angulate</i>	<ul style="list-style-type: none"> Red-listed invertebrate animal, associated with lakes and rivers.
Black Cottonwood / Poison Ivy – Rose <i>Populus trichocarpa</i> / <i>Toxicodendron ryrdbergii</i> – <i>Rosa spp.</i>	<ul style="list-style-type: none"> Red-listed ecological community, associated with riparian areas.
American Badger* <i>Taxidea taxus</i>	<ul style="list-style-type: none"> Red-listed vertebrate animal, associated with grasslands, shrublands, and roadside areas.
Western Centaury <i>Zeltnera exaltata</i>	<ul style="list-style-type: none"> Red-listed vascular plant, associated with pond ecosystems.
<p>Additionally, there are 14 blue-listed species or ecological plant communities located throughout the AOI, nine of which are associated with grassland / shrubland ecosystems.</p>	
<p>In total, there are 96 individual critical habitat locations for federally-listed species at risk within the AOI, many of which are also provincially recognized as red-listed or blue-listed species.</p>	



Map 3: Display of red-listed and blue-listed species or ecosystems at risk, as well as critical habitat for federally listed species at risk.

3.2.6 HAZARDOUS VALUES

Hazardous values are defined as values that pose a safety hazard to emergency responders and include large propane or fuel facilities, storage facilities containing explosives, etc. Anywhere combustible materials, explosive chemicals, or gas/oil is stored can be considered a hazardous value. Protecting hazardous values from fires is important to preventing interface fire disasters. No specific hazardous values were identified as part of this CWRP, though it is recognized that there are multiple industrial and/or commercial sites throughout the Town that could use, or be used to store, hazardous materials. It is important that Town of Oliver emergency staff and OFD be aware of these sites, and that any of these landowners or site operators are aware of and implement FireSmart principles on their buildings and properties and practice proper storage of combustible materials.

SECTION 4: WILDFIRE RISK ASSESSMENT

This section summarizes the factors that contribute to local wildfire risk in the AOI. Section 4.1 discusses the wildfire environment in the WUI, specifically topography, fuel, and weather, and includes climate change projections affecting the wildfire environment of the area. Section 4.2 discusses wildfire history in the area and Section 4.3 and Section 4.4 describe the analysis used to classify the local wildfire threat throughout the AOI. The local wildfire risk assessment helps to identify the parts of the AOI that are most vulnerable to wildfire. The relationship between wildfire risk and wildfire threat is defined as follows:

$$\text{Wildfire Risk} = \text{Consequence} \times \text{Probability}$$

Where:

Wildfire risk is the potential loss incurred to human life and values at risk within a community in the event of a wildfire.

Consequences are the repercussions associated with fire occurrence in an area. Higher consequences are associated with densely populated areas, areas of high biodiversity, etc.

Probability is the threat of wildfire occurring in an area and is expressed by the ability of wildfire to ignite and then consume fuel on the landscape – its *wildfire threat*. Wildfire threat is driven by three major components of the wildfire environment:

- 1) Fuel – loading, size and shape, arrangement (horizontal and vertical), compactness, chemical properties, and fuel moisture.
- 2) Weather – temperature, relative humidity, wind speed and direction, and precipitation.
- 3) Topography – slope and terrain (increase/decrease rate of spread), and aspect (fuel dryness).

4.1 WILDFIRE ENVIRONMENT

There are three main environmental components that influence wildfire behavior: topography, weather, and fuel. These components are generally referred to as the 'fire behaviour triangle' (Figure 4); the ways in which they individually influence the wildfire environment of the AOI will be detailed below.



Figure 4: Graphic display of the fire behavior triangle, and a subset of characteristics of each component⁹

4.1.1 FUEL

The ecological context of wildfire and the role of fire in the local ecosystem under both current and historical conditions is an important basis for understanding the current and future wildfire threat to a community. As well, the type and amount of fuel available for a wildfire is a major driver of the potential fire behaviour in an area. Fuel is the only component of the fire behaviour triangle that can be realistically managed through human intervention.

The Biogeoclimatic Ecosystem Classification (BEC) system classifies the province into zones by vegetation, soils, and climate. Regional subzones are then derived from relative precipitation and temperature. 90% of Oliver's AOI is classified into the Bunchgrass Very Dry Hot (BGxh1) BEC Zone, which transitions into the Ponderosa Pine Very Dry Hot (PPxh1) BEC Zone at higher elevations. Shrub-steppe and grassland ecosystems are dominant in the BGxh1, with conifer trees limited to gullied or sheltered areas with sufficient soil moisture. Historically, low-severity wildfires helped to maintain these ecosystems through reduced conifer encroachment and reduced density of antelope brush (*Purshia tridentata*) and big sagebrush (*Artemisia tridentata*). Cheatgrass (*Bromus tectorum*) is a highly flammable invasive grassland species in the BGxh1 which can alter fire frequencies and potential intensity when found at high density. Conifer trees are more common in the PPxh1, but this zone hosts a mosaic of forests, grasslands, brushlands, rock outcrops, cliffs, talus, and wetland ecosystems. The density of trees in forests of the PPxh1 is variable and in response to fire, disease history, and soil

⁹ Graphic adapted from the Province of Alberta

moisture. Throughout the AOI, extensive land-clearing for development and agriculture, a history of fire suppression, livestock grazing, and recent wildfires have all combined to result in an ecosystem composition and structure that is very diverse.¹⁰ Fuel arrangements in the area surrounding Oliver currently range from low to high hazard, and this hazard generally increases as areas progress through succession in the absence of ecosystem-maintaining disturbances.

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines sixteen fuel types based on characteristic fire behaviour under defined conditions.¹¹ Limitations to the accuracy of the FBP system in the interior of British Columbia have been recently discussed in literature, though this CWRP will make use of the FBP system as the best available data for baseline fuel typing and resulting fire threat analyses.¹² Fuel types (confirmed or updated by field work verification and/or orthophotography analysis) within the AOI are detailed in Table 6 and are shown on Map 4 below. Fuel typing was not performed on private land or on OIB #1, therefore it is important to note that the natural or landscaped conditions and/or structural conditions in these areas can result in a fire hazard that is higher than the surrounding area.

Approximately 30% of the assessable portion of the AOI (i.e., non-private land or not on OIB #1) is represented as “non-fuel”, which was applied to areas with no available forest, grass or shrub fuels. This was applied to developed areas, roadways, gravel clearings, and irrigated fields / parks. This fuel type should not be misconstrued as not susceptible to fire as these areas still often contain combustible materials, flammable vegetation, and / or valuable infrastructure. As well, if any grass fields are not routinely irrigated and are allowed to grow to a height greater than 10 cm and dry out, they may support a rapidly spreading grass or surface fire capable of damage or destruction of property (O-1a/b fuel type). The baseline O-1a/b FBP fuel type was modified for this CWRP after consultation with fire behaviour analysis professionals from Natural Resources Canada, and these modifications are described in Table 6. The potential head fire intensity of an O-1a/b fuel type is highly dependent on the ground fuel load, which varies considerably in natural areas of the AOI in response to disturbance history.

The main forested fuel types present in the AOI are C-7 and D-1/2. C-7 fuel types are generally considered as moderate to high hazard, fluctuating in response to the surface fuel load (grass, needles, and deadfall) and the density of conifers. D-1/2 fuel types are generally low hazard, but can contain hazardous surface fuel loads if there is a high proportion of deadfall or decadent shrub material. Fuel types were assigned spatially to larger areas with consistent structure, though it is extremely common for any lower hazard forests to contain pockets (e.g., individual areas up to 0.1 hectares in size) that have higher-risk qualities.

¹⁰ Information in this section derived from the Land Management Handbook #76: A Field Guide to Ecosystem Classification and Identification for the Southern Thompson-Okanagan (2022).

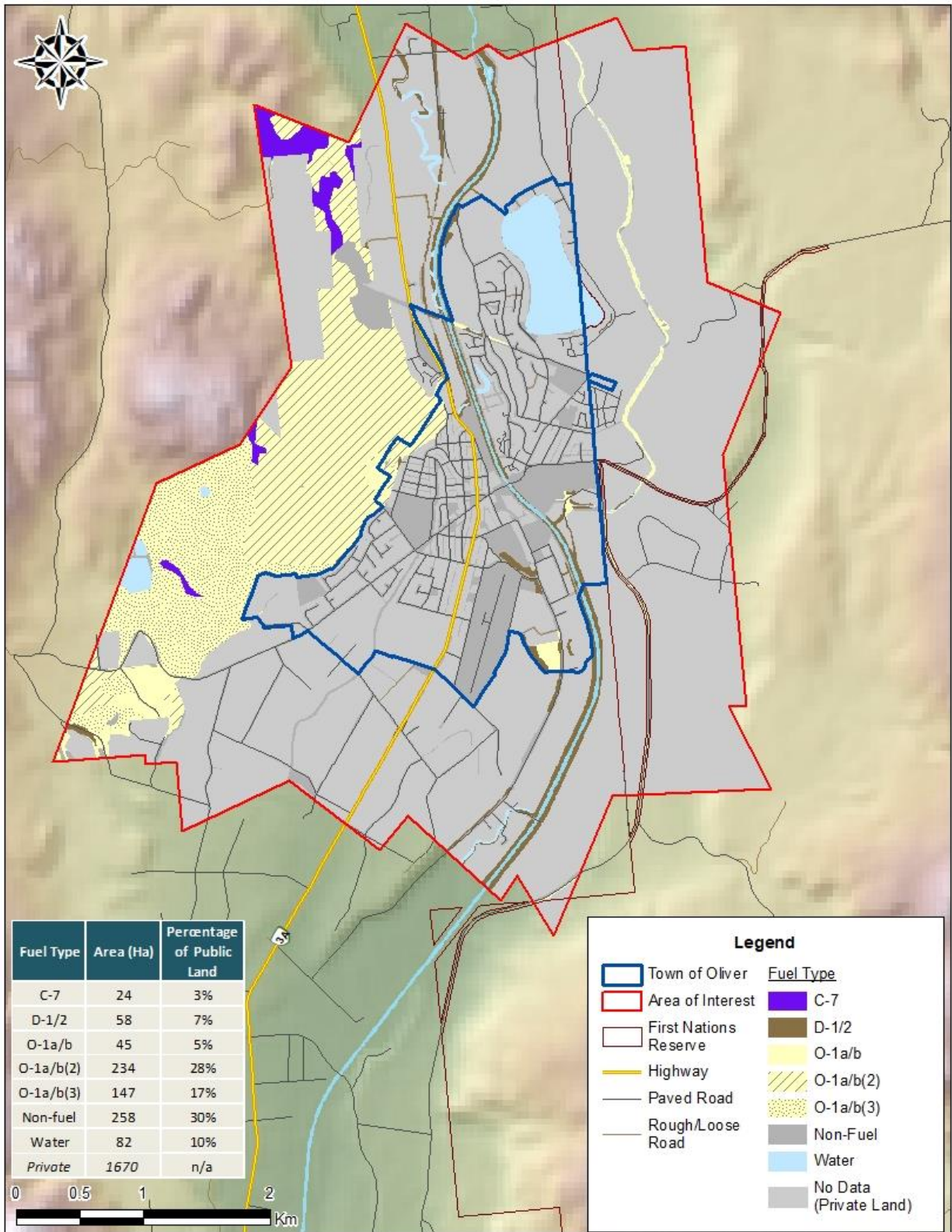
¹¹ Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

¹² Baron, J.N., Hessburg, P.F., Parisien, MA. *et al.* Fuel types misrepresent forest structure and composition in interior British Columbia: a way forward. *Fire Ecology* 20, 15 (2024). <https://doi.org/10.1186/s42408-024-00249-z>

Detailed fuel type descriptions and their associated wildfire risk can be found in Appendix D-1: Fuel Typing Methodology and Limitations. Table 6 below summarizes the percent of the non-private land in the AOI that is best represented by each FBP fuel type as well as the non-fuel area.

Table 6: Updated fuel types (by area and percent) within the AOI. Remainder of the AOI not shown is private land or on OIB #1 – covering 1678 hectares.

Fuel Type	Fuel Type Description within WUI	Hectares of AOI	Percent of Public Land
O-1a/b	Baseline grassland fuel type, assigned to areas with little fuel contribution from flammable shrubs (e.g., sagebrush, antelope-brush). Assigned to areas burned in 2023.	45 ha	5%
O-1a/b (2)	Moderate hazard grassland / shrubland, assigned to areas with a considerable continuity of sagebrush / antelope-brush. Assigned to areas burned in 2015 that have regenerated with ~50 cm tall shrub mixed in with bunchgrass. Often contains a low continuity of conifer trees.	234 ha	28%
O-1a/b (3)	High hazard shrubland, assigned to areas with a high continuity of sagebrush / antelope-brush and a considerable decadent shrub component. Assigned to areas unburned since the 1960s. Often contains a low continuity of conifer trees. This fuel type was also observed in multiple locations on OIB #1.	147 ha	17%
C-7	Conifer forest – a mix of Ponderosa Pine and Douglas-fir with grassland and shrub-steppe ecosystems between, open-canopy conditions at the stand level. Considerable needle component.	24 ha	3%
D-1/2	Deciduous stands and/or deciduous shrub communities, often associated with riparian areas (inherently included non-fuel access features [e.g., river pathway] where it could not be spatially removed).	58 ha	7%
Non-fuel / Water	Areas with no available forest, grass or shrub fuels (e.g., roadways, gravel clearings, irrigated fields / parks, developed areas, orchards/vineyards, cemeteries, the dyke trail, golf courses, the airport).	258 ha / 82 ha	30% / 10%



Map 4: Updated fuel types present throughout Oliver's CWRP area. "Private Land" includes the area within OIB #1 and has a minor discrepancy with the actual area of 1678 hectares due to overlapping polygons / inconsistencies in the Parcel Fabric dataset.

4.1.2 WEATHER

Considering fire danger varies from year to year, historical weather data can provide information on the number and distribution of days when the AOI is typically subject to high fire danger conditions. 'High fire danger' can be considered with a Canadian Forest Fire Danger Rating System (CFFDRS) Danger Class rating of 4 (High) or 5 (Extreme). Average danger class days as reported by two nearby BC Wildfire weather stations were summarized to indicate comparable fire weather conditions for the AOI. Figure 5 and Figure 6 below demonstrate the average number of days in each fire danger class by month for the *Penticton RS & McCuddy* weather stations.

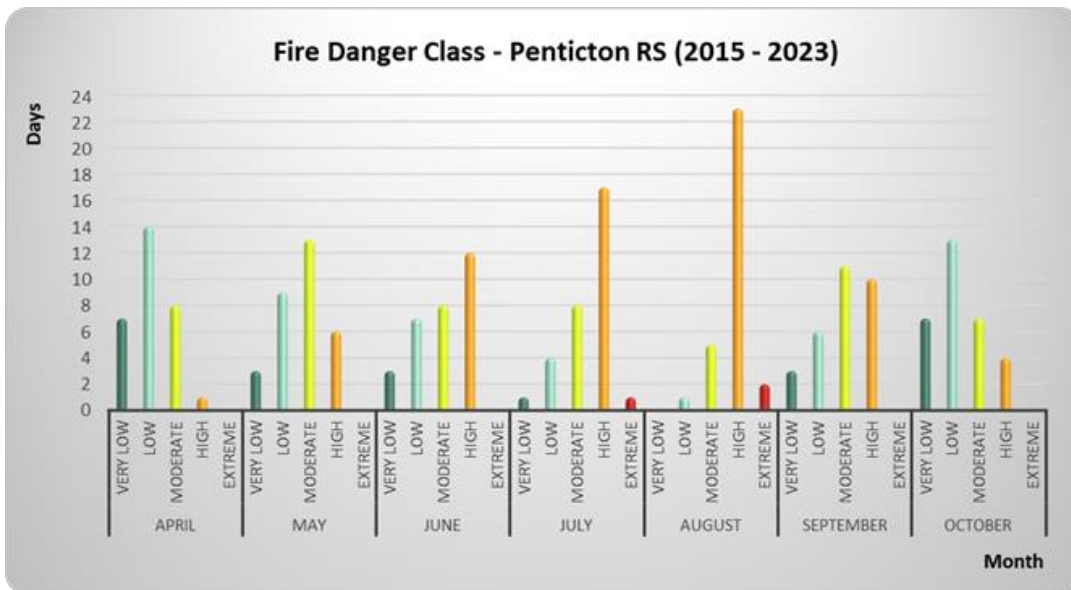


Figure 5: Average number of danger class days for the Penticton RS BCWS fire weather station.

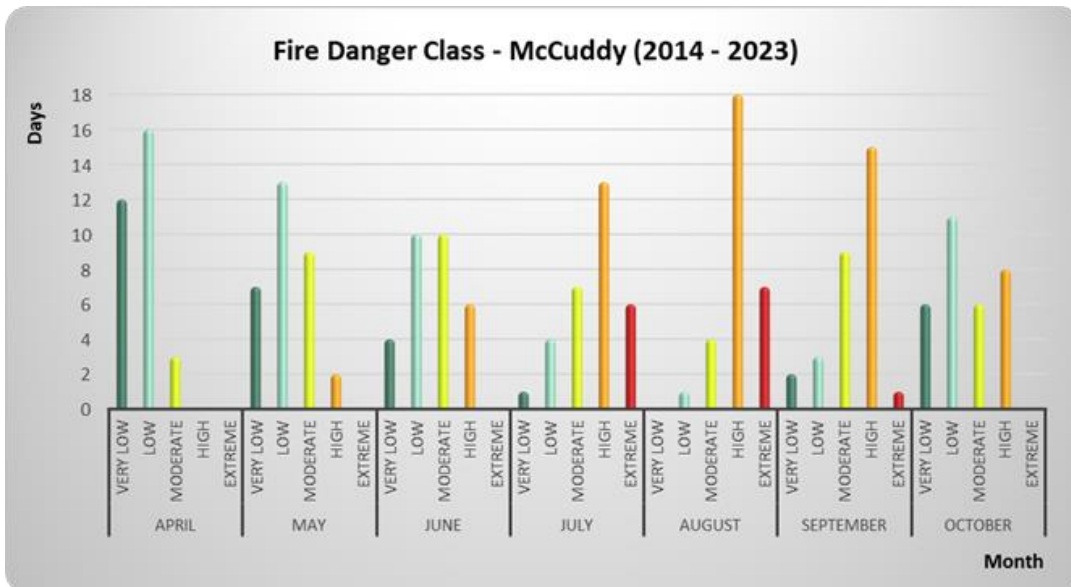


Figure 6: Average number of danger class days for the McCuddy BCWS fire weather station.

This data shows that fire weather is highest in July and August where an average of 18 days per month are 'high' danger class days and 4 days per month are 'extreme' danger class. During the peak four months of fire season (i.e., June through September), approximately 54% of days are rated as high or extreme fire danger. Data from both of these weather stations also demonstrates that periods of high fire danger regularly occur in shoulder season months (i.e., April through October), though the majority of larger fire events in the South Okanagan since the 1950's have occurred during peak fire season.

Fire weather data is a product of four primary weather inputs (temperature, relative humidity, wind, and precipitation) which can be variable on a small scale based on the specific location of the weather station. The *Penticton RS* station is located on the Naramata Bench amongst actively managed vineyards, which likely depresses the fire danger rating due to an increase in local relative humidity. This weather station is also located in the PPxh1 BEC zone which receives approximately 15% more annual precipitation and 19% more summer precipitation than the BGxh1,¹³ which may also lead to an underestimation of average fire weather conditions further south down the Okanagan Valley. Similarly, the *McCuddy* weather station is located in a flat clearing off of McCuddy Creek Road at 1067 m elevation in the Interior Douglas-fir (IDF) xh1 (for comparison the AOI spans from 300 – 600 m). The IDFxh1 receives approximately 44% more annual precipitation and summer precipitation than the BGxh1, with a summer heat to moisture index that is 37% lower than the BGxh1. Local wildfire professionals have stated that neither of these weather stations offer an accurate representation of Oliver, and that a new station that is to be installed in Little Chopaka in 2024 will likely provide data that is more representative of valley bottom conditions.

Wind speed and direction are also critical components of fire behavior. A wildfire that occurs upwind of a value poses a more significant threat to that value than one which occurs downwind. The Initial Spread Index (ISI) is a numeric rating of the expected rate of fire spread that combines the effects of wind speed and fine fuel moisture. Higher ISI values correspond with higher potential spread rates. Summarized in an Initial Spread Index (ISI) Rose from the *Penticton RS* and *McCuddy* weather stations, data shows that during the fire season (April – October) predominant winds originate from the west / northwest, driving fires in an east, southeast direction (see Appendix D-4: Fire Spread Patterns). Local wildfire professionals confirmed this predominant wind direction for this region of the South Okanagan, and noted that the majority of aggressive fires in the South Okanagan have been heavily wind-driven. This predominant wind direction is largely paired with low ISI values (between one and ten), which often do not produce very hazardous fire weather conditions. Wind direction on higher ISI days (greater than 10) is much more variable with additional records from all cardinal directions, which results in the effect of wind on fire spread being highly variable and unpredictable.

¹³ Subzone climate data from the UBC Center for Forest Conservation Genetics, accessed from: <https://cfcg.forestry.ubc.ca/resources/cataloguing-in-situ-genetic-resources/subzonevariant-climate-data/>

Climate Change

Climate change is projected to contribute to changes in the fire regime, forest attributes, and fuel hazard across BC. Climate scientists expect that the warming global climate will trend towards wildfires that are increasingly larger, more intense, and more difficult to control. Furthermore, these fires will likely threaten communities in the WUI more often due to an increased potential for intense fire behaviour, fire season length, and fire severity.¹⁴ As outlined in the *Climate Projections for the Okanagan Region* report¹⁵ the following predictions for the South Okanagan are made:

- More pronounced drought in the summers (a 14 - 17% decrease in summer precipitation). This trend is associated with drier fuels and soils which can increase fire behaviour potential;
- More extreme-heat days in the region (9 additional days above 30°C per year by the 2050s and 24 additional days above 30°C per year by the 2080s);
- Longer warm seasons and shorter cold seasons (future May temperatures similar to present-day August temperatures)
- Increase in precipitation in the spring (a 10 – 12% increase in spring precipitation). This trend may be associated with greater grass and shrub growth prior to summer drought.

4.1.3 TOPOGRAPHY

Slope steepness influences a fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill. Other factors of topography that influence fire behaviour include aspect, elevation, and configuration of features on the landscape that can restrict (i.e., water bodies, rock outcrops) or drive (i.e., gulleys, exposed ridges) the movement of a wildfire. The effect of slope on fire behaviour is shown annually with fires in the South Okanagan, as was demonstrated with rapid upslope spread on the 2023 fire east of Spartan Street. Table 7 shows the percent of the AOI by slope percent class and the associated fire behaviour implications.

Table 7: Slope Class and Fire Behaviour Implications for the Town of Oliver CWRP area.

Slope	Percent of AOI	Fire Behaviour Implications
<20%	81%	Very little flame and fuel interaction caused by slope, normal rate of spread.
21-30%	8%	Flame tilt begins to preheat fuel, increasing rate of spread.
31-45%	5%	Flame tilt preheats fuel and begins to bathe flames into fuel, high rate of spread. Common slope class found in the area of the October 2023 fire.
46-60%	5%	Flame tilt preheats fuel and bathes flames into fuel, very high rate of spread.
>60%	1%	Flame tilt preheats fuel and bathes flames into fuel well upslope, extreme rate of spread.

¹⁴ BC Provincial Government. 2020. Preliminary Strategic Climate Risk Assessment. Retrieved from: <https://www2.gov.bc.ca/gov/content/environment/climate-change/adaptation/risk-assessment>

¹⁵ Pacific Climate Impacts Consortium & Pinna Sustainability. Climate Projections for the Okanagan Region. February 2020. Retrieved from: <https://www.rdos.bc.ca/assets/PLANNING/AreaX/2020/ClimateProjections/FinalReport.pdf>

The vast majority of the AOI (81%) is on less than a 20% slope and will likely not experience accelerated rates of spread due to topography alone. Considering slope-effect independently, 8% of the AOI is likely to experience an increased rate of spread, with 5% experiencing a high, 5% a very high, and 1% an extreme rate of spread. When slope percentage is considered in context with a value's slope position, that value's risk to increased fire behaviour can change dramatically – i.e., a value located in the upper 1/3 of a steep slope (>40%) will likely be exposed to fires that are located downslope, with the potential to quickly spread uphill towards it, as well as be impacted by increased amounts of preheating (convective heat). Table 8 summarizes the fire behaviour implications of slope position. A value located at the bottom of a slope is equivalent to a value on flat ground.

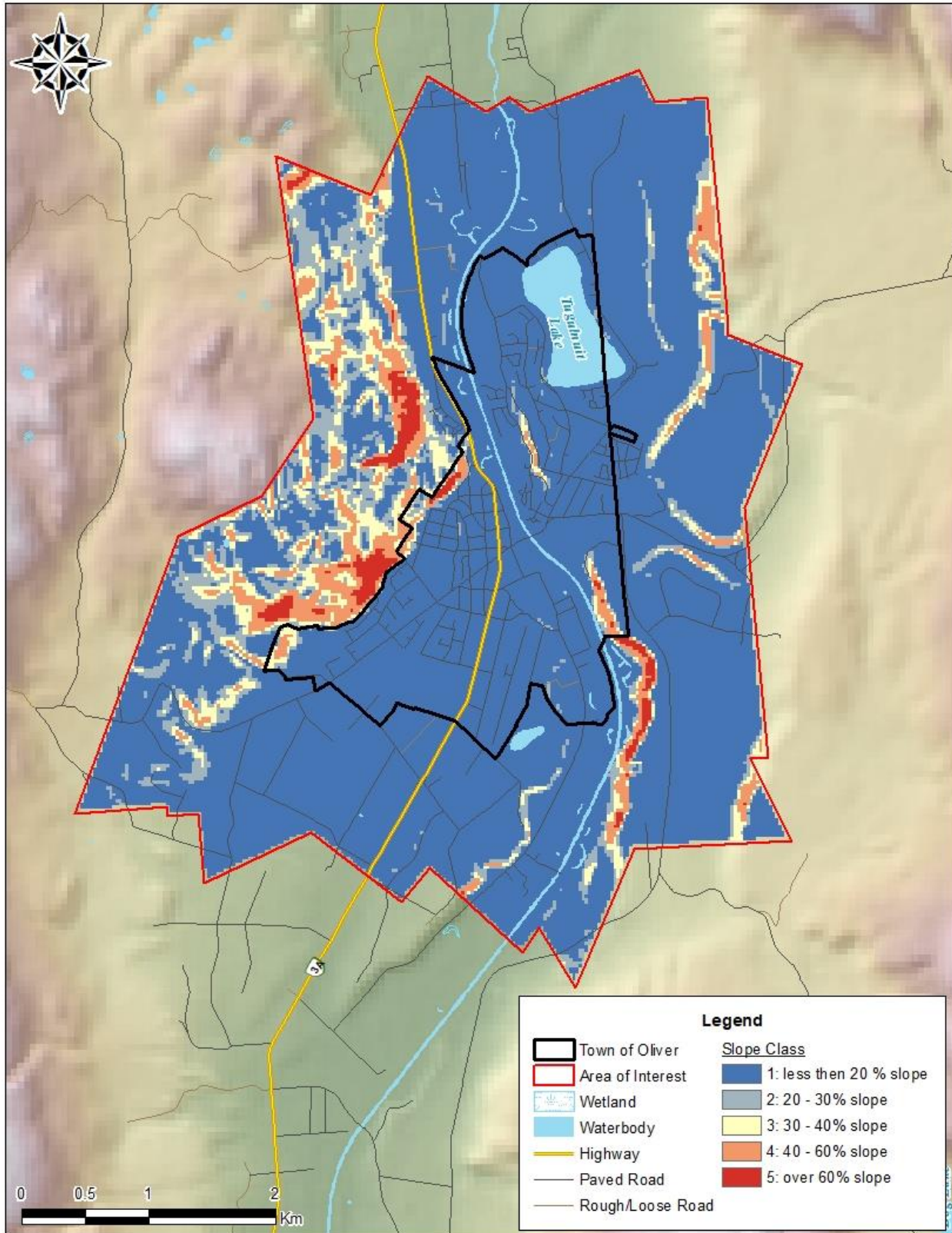
Table 8: Slope Position of Value and Fire Behaviour Implications

Slope Position of Value	Fire Behaviour Implications
Bottom of Slope/ Valley Bottom	Impacted by normal rates of spread.
Mid Slope - Bench	Impacted by increasing rates of spread. Position on a bench may reduce the preheating near the value. (Value is offset from the slope).
Mid slope – Continuous	Impacted by fast rates of spread. No terrain break features affecting preheating and flames rolling over into the fuel ahead of the fire.
Upper 1/3 of Slope	Impacted by extreme rates of spread. At risk to large, continuous fire run. Preheating and flames rolling over into the fuel.

The majority of the Town of Oliver's residential areas and community infrastructure are located on relatively flat ground at or near valley bottom, and thus are associated with little slope-driven flame and fuel interaction. Neighbourhoods generally only have 20 meters of elevation gain within them, though there are short, steep slope breaks within town that would support a rapidly spreading brush-fire that have values positioned at the top of them (e.g., Salamander Ave / Bellevue Drive, Spillway Road, Sawmill Road, Black Sage Road). Conditions are unique on undeveloped portions of Oliver Mountain as slopes are often > 30%. See Map 5 on the following page for a depiction of the slope classes throughout the AOI.

The aspect of a land base can also greatly affect the potential fire behaviour as the amount and timing of sunlight received affects temperatures, humidities, and fuel moisture amounts. Aspect is variable throughout the AOI and less considerable given the generally flat topography. South / southwest facing areas (i.e., slopes east of the Okanagan River dyke) have the most daily exposure to sun, especially during the peak burning period¹⁶ which can produce hot and dry atmospheric conditions that combine with low fuel moisture amounts.

¹⁶ Peak burning period is generally referred to as between 14:00 – 18:00, where fuel moisture conditions are at their lowest.



Map 5: Slope class map of the Area of Interest, displaying short, steep slope breaks within (and adjacent to) Town, and consistently steep conditions on Oliver Mountain.

4.2 WILDFIRE HISTORY

Historic Fire Regime

BEC zones have been used to classify BC into five Natural Disturbance Types (NDTs) based on the frequency and severity of pre-European disturbance events (including, but not limited to, wildfires), which roughly indicate historic fire regimes.¹⁷ This system characterizes the AOI and the surrounding forests as NDT 4 – ecosystems with frequent stand-maintaining events – with subtle differences between the BGxh1 and PPxh1. In the BGxh1, discontinuous fuels in dry grassland and shrub-steppe ecosystems, and many natural barriers (i.e., cliffs, rivers), likely limited the spread of wildfires historically. However, the potential intensity of historic fires was likely limited due to frequent wildfires and traditional cultural burning by the Syilx people limiting the build-up of shrub vegetation. In the PPxh1, frequent low-intensity and low-severity fires historically burned grassland areas with moderate-intensity burning in dense conifer patches, killing off younger trees.

Humans have had a marked impact on potential wildfire intensity in both the BG and the PP BEC zones. While fire suppression, livestock grazing, and urban sprawl / agriculture has historically reduced fire frequency in these ecosystems, human activity has introduced invasive grass species (e.g., Cheatgrass) into historically discontinuous shrub-steppe areas – which can increase the frequency and likelihood of fire spread. Decades of fire suppression in the South Okanagan has allowed for shrub vegetation to build-up, for decadent shrub material to accrue, and for the encroachment of conifers into historic grasslands. These factors all increase potential fire behaviour – though development, physical barriers (roads), and livestock grazing have decreased the potential fire behaviour in many areas. Local wildfire staff have noted the usefulness of physical barriers (e.g., fire guards, pre-existing access features) while performing burn-off operations on interface fire events in recent years.

Historical Wildfire Occurrences

Historical fire ignition and perimeter data for the AOI and the surrounding area are depicted on Map 6. Analyzing BCWS' historical fire ignition dataset (summarized below in Figure 7), the majority of ignitions within the Oliver area have been human-caused, with only 24% of fires attributed to lightning. There have been 434 recorded ignitions in the surrounding area (within 5 kilometers of Town boundaries) since 1950, with 90 of these having ignited inside the AOI.¹⁸ Figure 8 displays the cumulative area burned in this same area between 1950 and 2023, showing that very little area was burned between 1950 and 2015. Extensive portions of the AOI and the surrounding area have burned since 2015 by a small number of standalone fire events, the most impactful of which are summarized in Table 9.

¹⁷ Province of British Columbia, 1995. Biodiversity Guidebook.

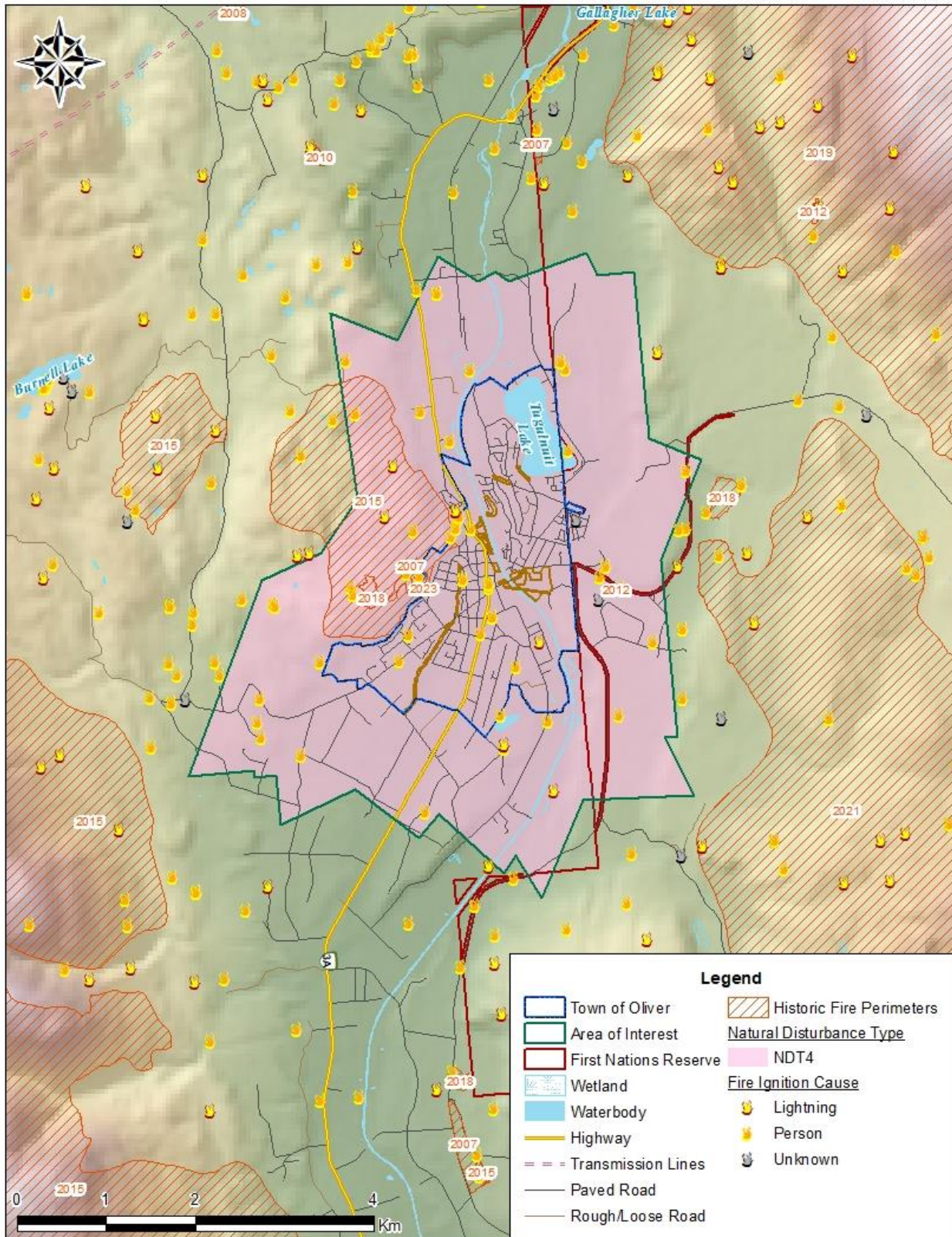
¹⁸ Smoke chases and nuisance fires were not separated out of this dataset (representing 17 and 41 datapoints respectively) as they still use up available first responder resources.

Table 9: Summary of major fire events in the Oliver area since 2015.

Fire Number - Year (Name)	Fire Size (Hectares)	Fire Information
K50619 – 2015 Oliver Mountain	371	-Human caused, burned through decadent shrubland on Oliver Mountain -Triggered an evacuation order within Oliver -K50438 (131 ha) also occurred across Fairview Road lightning
K52061 – 2021 Nk'Mip Creek	19,930	-Human caused, burned within OIB #1 from Osoyoos to Oliver, and spread east to ~1880m in elevation -Triggered multiple evacuation orders and alerts
K51244 – 2019 Eagle Bluff	2,640	-Human caused, burned southeast of Gallagher Lake in rocky/broken topography -Triggered multiple evacuation orders and alerts
K50615 – 2015 Testalinden Creek	5,202	-Lightning caused -Triggered multiple evacuation orders and alerts, and closures of Highway 3
K52813 – 2023 Upper Park Rill Creek	2,381	-Human caused -Triggered multiple evacuation orders

The “fire-deficit” that was present in the Oliver area leading into the 2010’s made conditions extremely favourable for the uncontrollable spread of wildfire. Multiple areas adjacent to Oliver that have still not experienced fire since the 1960s or earlier have built up a highly hazardous shrub fuel load – typed as O1a/b (3) in Section 4.1.1 and on Map 4. Local wildfire and structural firefighting professionals have raised concerns with fire potential and suppression difficulty in these areas that have not had frequent fire (i.e., that have a high continuity and volume of sagebrush / antelope-brush). Wildfire professionals have also commented that the fire hazard in these decadent shrub areas can easily be mitigated with regular prescribed fire in the spring and fall. Though the Oliver Mountain and Nk’Mip Creek fires burned at high intensity, healthy ecosystems have quickly re-established in these areas.

Overall, human-caused fires (which includes escaped structure fires, industrial fires, vehicles fires, campfires, arson, etc.) pose the highest wildfire ignition threat within the Town of Oliver and the surrounding area. Common ignition concerns from local officials are from landowners irresponsibly burning on their property (which is mostly in the spring / fall when fire hazard is lower), and from transient individuals living on the outskirts of Town who are likely not aware of fire danger and/or are not following regular precautions.



Map 6: Natural disturbance regime and historical fire ignitions (1950 – 2022) and fire perimeters (2007 – 2023) within and adjacent to the Town of Oliver. Fire perimeters are only shown for fires larger than one hectare.

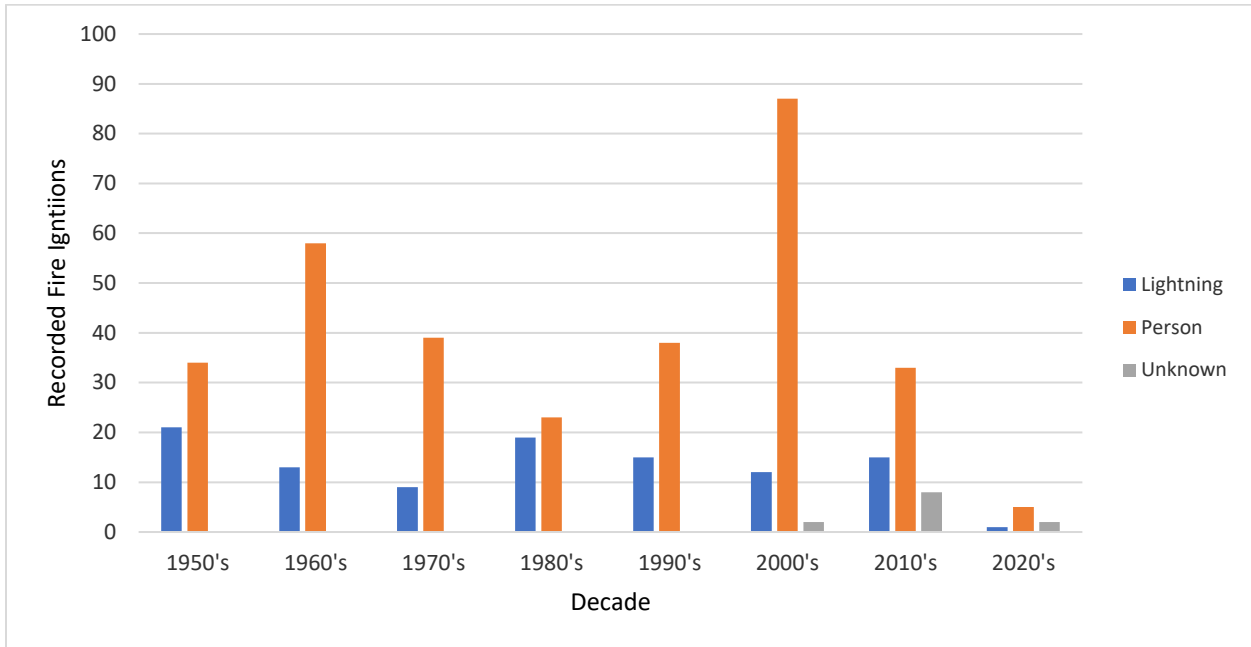


Figure 7: Historical wildfire ignitions within a 5-kilometer buffer of the Oliver area, categorized by ignition cause and decade. Data from BCWS ignition dataset – Data BC.

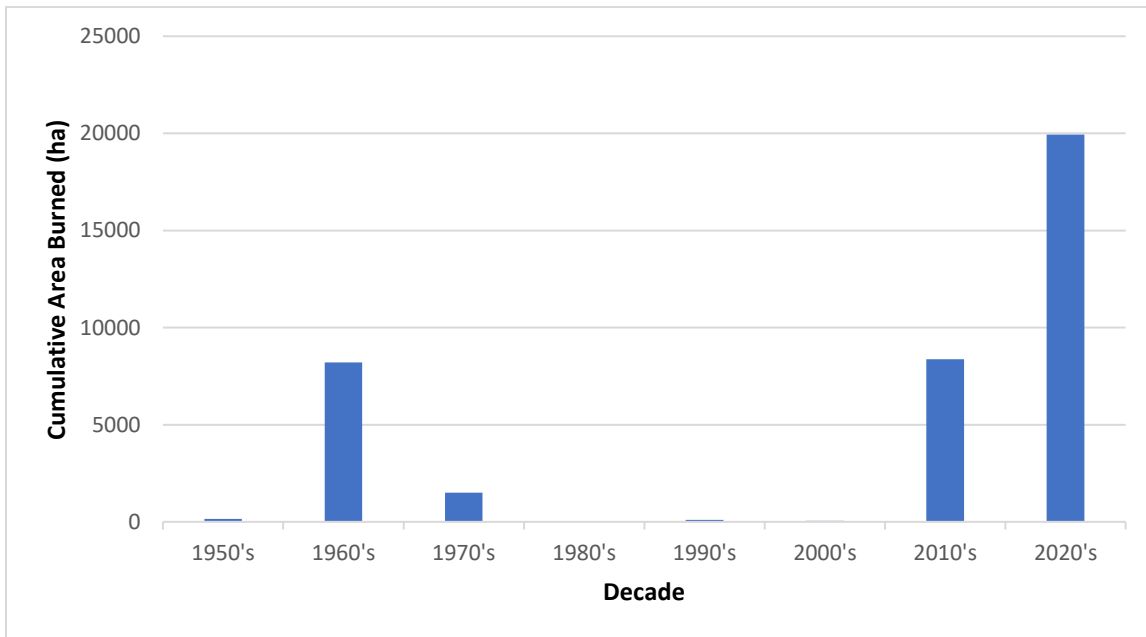


Figure 8: Historical cumulative area burned by wildfire within a 5-kilometer buffer of the Oliver municipal area. Data from the BCWS fire perimeter dataset - Data BC.

4.3 RISK FRAMEWORK AND RISK CLASS MAPS

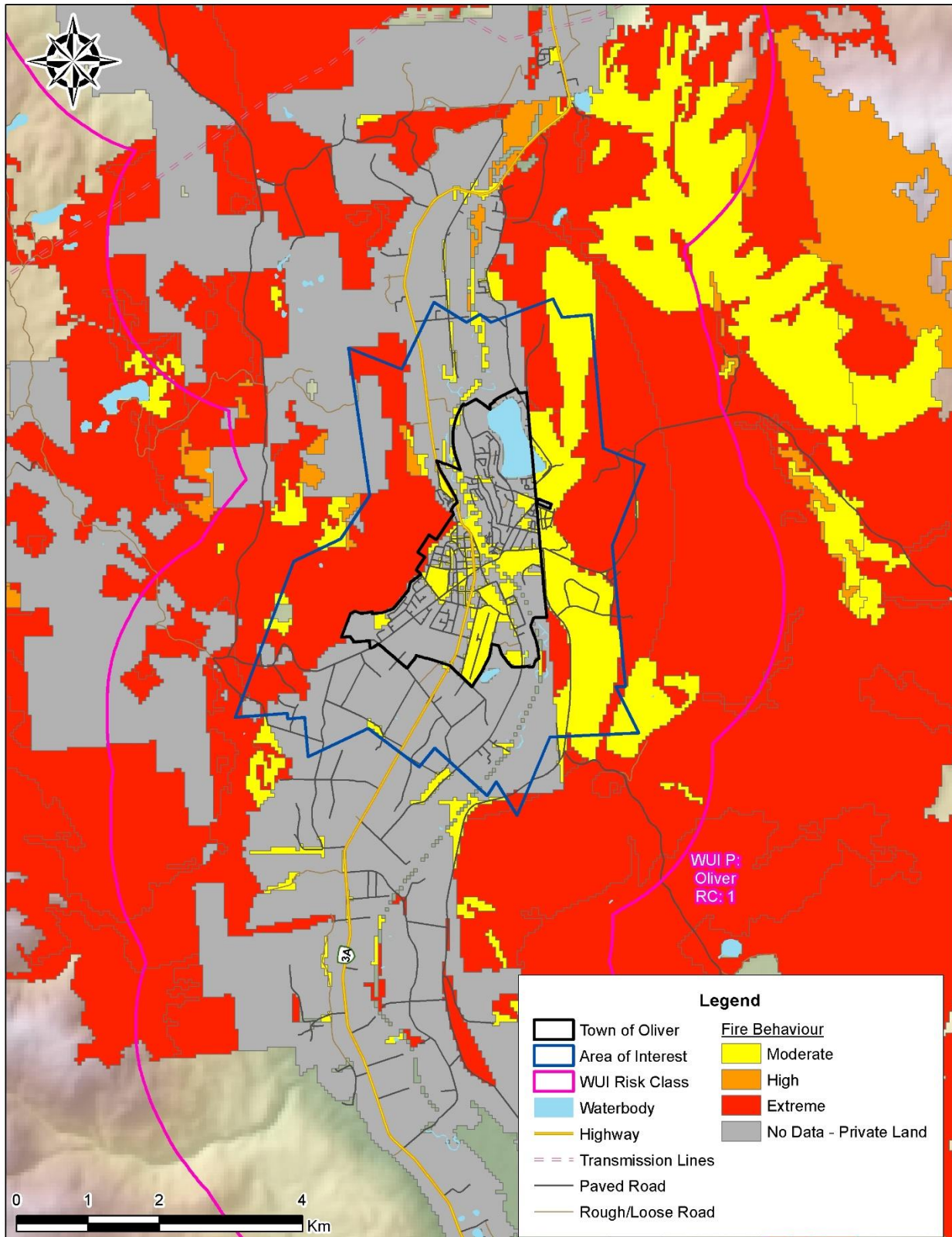
Differing risk levels require tailored risk management to minimize negative impacts from wildfires to communities and high value critical infrastructure. For the Town of Oliver, the intent of identifying wildfire risk is to enable cost effective wildfire risk reduction strategies that will mitigate wildfire threat and enhance community resilience at the local scale.

Provincial Strategic Threat Analysis

The Provincial Strategic Threat Analysis (PSTA) is a publicly-available spatial database that is designed to consistently assess and map different aspects of wildfire threat and risk around the province.¹⁹ The PSTA can be used as a starting place from which more detailed local threat assessments can be performed (see Section 4.4), and to support FireSmart funding applications through the Union of BC Municipalities' (UBCM) FireSmart Community Funding and Supports program. The PSTA Fire Threat Rating integrates coarse-scale, provincially determined wildfire threat components such as fire likelihood (historical fire occurrence), potential severity (weather conditions and fuel type), and wildfire propagation potential (spotting). Notably, this threat analysis does not extend onto private land.

In addition to the PSTA, the BC Wildfire Service has developed the WUI Risk Class Framework, which defines the WUI based on a 2-kilometer or 2.75-kilometer buffer around a specified structure density. This Risk Class Framework combines with threat ratings from the PSTA to produce weighted risk class polygons – with “1” being the highest relative risk in the province and “5” being the lowest. The Town of Oliver has a WUI Risk Class of “1”. Although this represents the historic approach to defining the WUI in BC, this process doesn't account for non-structural values that may be considered values at risk for a community, highlighting the importance of local community wildfire planning. The PSTA Fire Threat Rating and WUI Risk Class Rating of Oliver is shown in Map 7 on the following page.

¹⁹ Province of British Columbia. 2023. 2021 Update: Provincial Strategic Threat Analysis (PSTA). Retrieved from: <https://www2.gov.bc.ca/gov/content/safety/wildfire-status/prevention/fire-fuel-management/psta>



Map 7. Town of Oliver PSTA Fire Threat Rating and WUI Risk Class Rating

4.4 LOCAL WILDFIRE RISK ASSESSMENT

There are two main components of the local wildfire risk assessment for this CWRP: the analysis of the Wildfire Threat Class (which contains fuels, weather, and topography sub-components) and the WUI Risk Class (which includes a structural sub-component). This process includes several key steps as outlined in Appendix D: Local Wildfire Risk Process and summarized as follows:

- Fuel type attribute assessment: Ground truthing/verification and updating as required to develop a local fuel type map;
- Consideration of the proximity of fuel to the community: Recognizing that fuel closest to the community usually represents the highest hazard;
- Consideration of topography in relation to values (Table 7 and Table 8): Slope percentage and slope position of the value are considered, where slope percentage influences the fire's trajectory and rate of spread and slope position relates to the ability of a fire to gain momentum uphill.
- Stratification of the AOI: According to relative wildfire threat based on the above considerations, other local factors, and field assessment of priority wildfire risk areas.

It is important to note that the Local Wildfire Risk Assessment analysis did not apply to any areas outside of the AOI, nor any private land or OIB #1. As well, the assessment quantifies threat as it relates to forest fuels and does not include the ignition potential of residential landscaping, structures or other infrastructure. Structure fires and structure-to-structure spread in a wildfire scenario are largely attributable to hazardous conditions in the Home Ignition Zone of a structure (i.e., the area within 30 m of the principal building and/or its attachments). However, the analysis does provide relevant information regarding wildfire threat that should be considered for FireSmart and emergency management planning and preparedness.

4.4.1 WILDFIRE THREAT CLASS ANALYSIS

Classes of the wildfire threat class analysis are as follows:

- Extreme: Hazardous fuel types with potential for high-intensity fire and rapid spread, often present on steeper slopes, rough or broken terrain and/or south or west aspects. High likelihood of candling / crowning where conifer trees are present;
- High: Moderate hazard fuel types will less potential for high-intensity fire and rapid spread, but present on comparable topographic features to "extreme" threat areas. High likelihood of candling / crowning where conifer trees are present;
- Moderate: Lower hazard grassland / shrubland areas on moderate topography, or deciduous fuel types on steeper topography. Likely result in a moderate intensity surface fires that can be damaging to homes and structures. Candling and intermittent crown fires can occur where conifer trees are present;
- Low: Developed and undeveloped land that is unlikely to support significant wildfire spread;
- Very Low: Waterbodies with no forest or grassland fuels, posing no wildfire threat;

- **No Data (Private Land):** Private parcels or on OIB #1 with either developed or vegetated areas. Conditions can be associated with high/extreme threat conditions.

The results of the wildfire threat class analysis for the AOI are shown on Map 8 and in Table 10 below. A considerable proportion of assessable area within the AOI has a 'High' or 'Extreme' threat (30% and 14% respectively), while 9% has a 'Moderate' threat and 7% has a 'Low' threat. 30% of the assessable area contained non-fuel conditions and was assigned a 'Low' threat – though these areas often contain infrastructure-based values at risk. 10% of the assessable area contained water and was not assigned a wildfire threat.

Table 10: Wildfire threat summary for the AOI.

Wildfire Threat			
Threat Class	Hectares	Percentage of AOI	% of Assessable Land
Extreme	119	5%	14%
High	250	10%	30%
Moderate	80	3%	9%
Low / Non-Fuel	58 / 258	2% / 11%	7% / 30%
Very Low/No Threat (Water)	82	3%	10%

Wildfire Threat Assessment Field Work

Wildfire Threat Assessments were completed over several days in April of 2024 in conjunction with the verification of fuel types (see Appendix D-1: Fuel Typing Methodology and Limitations) to support analyses and the potential delineation of fuel management areas. Due to the limitations in applying provincial Wildfire Threat Assessments to grassland or shrub-steppe ecosystems, only one site level Wildfire Threat Assessment was completed within the AOI. In addition, over 300 field stops were documented throughout the AOI (e.g., qualitative notes, fuel type verification, and/or photograph documentation) in areas that had road or trail access, in order to build the most accurate assessment of local fire risk possible (see Appendix D-2: Wildfire Threat Assessment , along with Map 8).

Field assessment locations were prioritized based upon:

- **Proximity to values at risk:** Field assessments were clustered in the intermix and interface, as well as around critical infrastructure.
- **Local knowledge:** Areas identified as hazardous, potentially hazardous, with limited access/egress, or otherwise of particular concern as vulnerable to wildfire, as communicated by local fire officials and community representatives.
- **Observations:** Additional areas potentially not recognized prior to field work were visually identified as hazardous and assessed during the week.
- **Verifying provincial classification:** Areas classified as higher threat in the Provincial Strategic Threat Analysis dataset, or with an uncommon fuel type, were assessed to ground-truth the fuel type and threat even if they were relatively far from values.

4.4.2 WUI RISK CLASS ANALYSIS

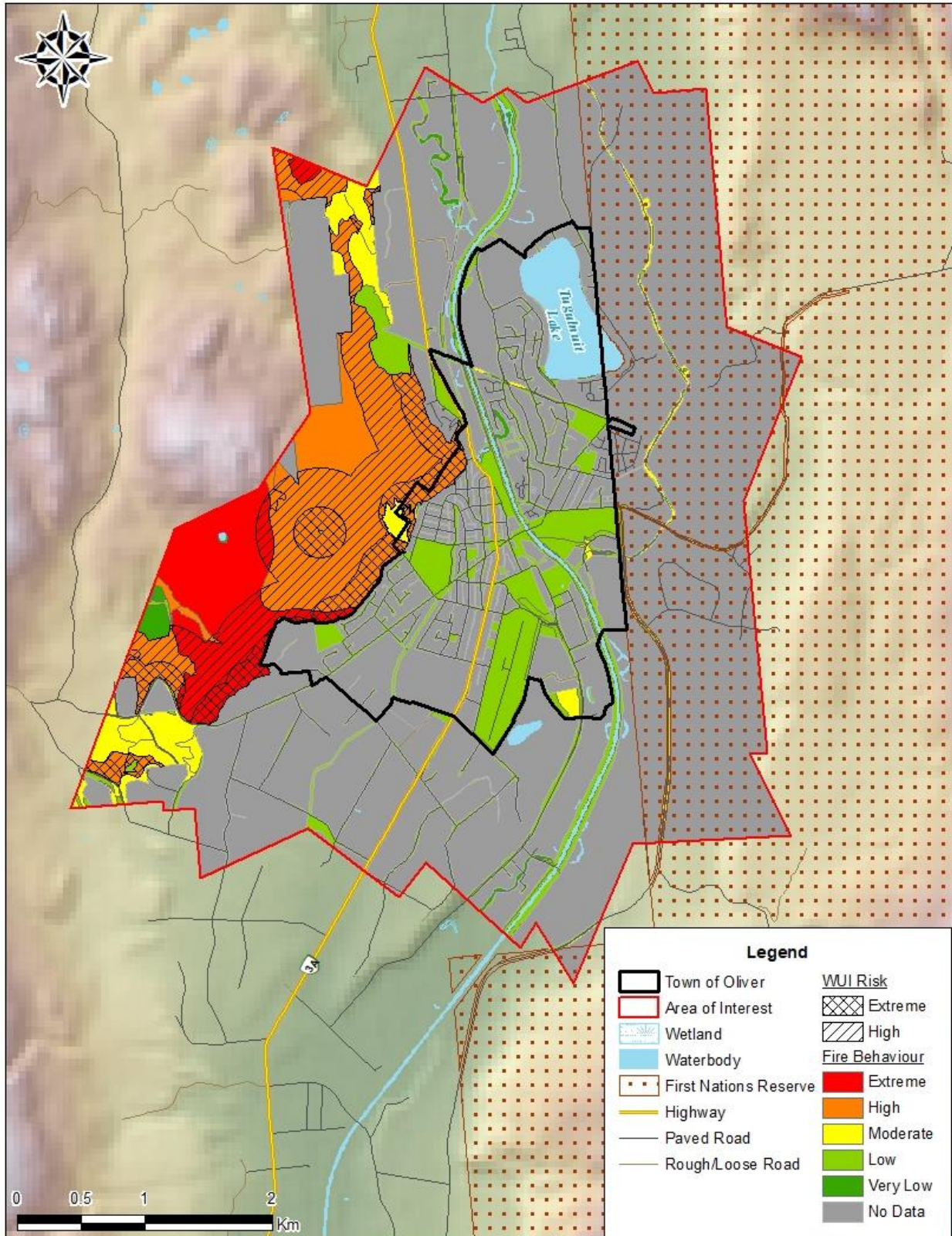
WUI Risk Classes are quantified when the Wildfire Threat (see Table 10 and Map 5) is assessed as ‘High’ or ‘Extreme’ (369 total hectares within the AOI), providing conditions that can result in unacceptable wildfire threats when near communities and developments. WUI Risk Classes are described below:

- **Extreme:** The high or extreme threat has the potential to directly impact a community or development and is located within 200m of structures;
- **High:** The high or extreme threat has the potential to directly impact a community or development and is located 200m to 500m from structures;
- **Moderate:** The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located 500m to 2km distance from structures; and,
- **Low:** The high or extreme threat is sufficiently distant from developments, having no direct impact on the community and is located over 2km from structures.

The results of the Risk Class Analysis for this CWRP are shown in Table 11 below. The highest risk areas are on the lower slopes of Oliver Mountain, where vegetation and topography align to present a considerable threat to adjacent infrastructure. High and extreme threat conditions extend throughout Oliver Mountain, especially in areas where wildfire has not affected the vegetation in multiple decades. Despite the subdued topography along roadways throughout the AOI, multiple road right-of-ways with irregularly maintained grass or flammable shrubs present moderate threat conditions.

Table 11: Wildfire risk class analysis for the Town of Oliver’s Area of Interest.

Wildfire Risk Based on Distance to Structures			
Risk Class	Hectares	Percentage of AOI	% of Assessable Land
Extreme	88	3%	10%
High	181	7%	22%
N/A (Moderate, Low, Very Low Wildfire Behaviour)	578	23%	68%



Map 8: Wildfire Threat Rating & Wildfire Risk Class Rating for the Town of Oliver's CWRP area.

SECTION 5: FIRESMART DISCIPLINES

FireSmart™ is the leading program in the country aimed at empowering the public and increasing neighbourhood resilience through wildfire mitigation measures. FireSmart has been implemented at the provincial / territorial level across Canada, including British Columbia in 2000. Basic FireSmart training for individuals is freely available through FireSmart Canada (FireSmart 101) and/or FireSmart BC (Local FireSmart Representative), along with a plethora of resources for homeowners, educators, and land managers at <https://firesmartbc.ca/>. The available training and resources provide the tools for individuals to be ambassadors for wildfire preparedness in their communities. The FireSmart program covers a wide breadth of preventative measures that are founded in the seven FireSmart disciplines: Education, Legislation and Planning, Development Considerations, Interagency Cooperation, Cross-Training, Emergency Planning, and Vegetation Management. These seven disciplines and the guiding principles behind FireSmart can be applied at several spatial scales, and are not restricted to any type of land ownership, forest type, or property type. Section 5.1 through 5.6 in this CWRP will discuss each of these FireSmart disciplines in depth.

It has been found that during extreme wildfire events, most home destruction has been a result of low-intensity surface fire flame exposures, usually ignited by embers (firebrands). Firebrands can be transported long distances ahead of a wildfire, across fire guards and fuel breaks, and can accumulate within the home ignition zone (HIZ, see Figure 9 on the following page) in densities that can exceed 600 embers per square meter. Combustible materials found within the HIZ can combine to provide fire pathways which can allow spot surface fires ignited by embers to spread and carry flames into contact with structures. Because ignitability within the HIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community has not been found to necessarily correspond to loss potential. For example, FireSmart homes with a low ignitability may survive high-intensity fires, whereas highly ignitable homes may be destroyed during lower intensity surface fire events.²⁰

²⁰ Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. Proc Natl Acad Sci U.S.A. Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/>.



Figure 9: FireSmart Home Ignition Zone

Many of the recommendations proposed in this plan are eligible for funding under the Union of BC Municipalities (UBCM) CRI FireSmart Community Funding and Supports (FCFS) program, which is an annually evolving program. In order to continue submitting funding applications through the FCFS program, it will be required that the Town of Oliver have *all* the following FireSmart components developed/active in their community:

- A person hired/contracted acting in a FireSmart position as a FireSmart coordinator;
 - The Town of Oliver currently staffs a FireSmart Coordinator position.
- An active Community FireSmart & Resiliency Committee (CFRC);
 - Oliver’s FireSmart Coordinator currently sits on a regional (Okanagan) CFRC – see Section 5.4 – Interagency Cooperation.
- A current CWRP that is acceptable to the local BCWS Wildfire Prevention Officer/Prevention Specialist.

Wildfire resilience initiatives that cannot be solely tackled by the Town of Oliver may be funded through the Ministry of Forests’ Crown Land Wildfire Risk Reduction (CLWRR) program or the various FNESS-ISC FireSmart programs.²¹ The Town of Oliver had not formally established a FireSmart program until hiring a FireSmart coordinator in 2023.

²¹ First Nations Emergency Services Society – Indigenous Services Canada FireSmart program provides a funding mechanism for FireSmart planning and implementation throughout Osoyoos Indian Band #1.

5.1 EDUCATION

Description

Public education and outreach play a critical role in helping a community prepare for and prevent a wildfire. FireSmart education creates a heightened awareness of wildfire risk and potential mitigative measures that property owners and residents can pursue, while participating in wildfire risk reduction activities can promote a sense of empowerment and shared responsibility in the community. A successful public education campaign can support the implementation of many other FireSmart disciplines by building support and understanding among both residents and visitors. FireSmart education activities largely constitute the 'Engagement' phase of the FireSmart Roadmap and form the foundation for wildfire resiliency (see Appendix G: FireSmart Roadmap).

Analysis

FireSmart education and public outreach initiatives in the Town of Oliver are managed by the Oliver and District Fire Department (OFD) through the appointed FireSmart Coordinator. At the time of writing, Oliver's FireSmart Coordinator is the only individual within OFD trained as a Local FireSmart Representative (LFR) and/or Wildfire Mitigation Specialist (WMS). The full-time FireSmart Coordinator staff position was created in 2023, which provides a dedicated individual to deliver Oliver's FireSmart program and implement the action plan from this CWRP. FireSmart education initiatives have been limited in Oliver prior to 2024, but public outreach activities in Oliver in the past year include:

- Posting FireSmart educational resources at: <https://www.oliver.ca/town-services/firesmart>;
- Hosting public FireSmart displays at local community events (Oliver Roots & Fruits Expo);
- Hosting a Wildfire Community Preparedness Day at the Community Park;
- Performing FireSmart and Emergency Preparedness Workshops at community buildings;
- Sharing information regarding FireSmart, open burning, and campfire bans through OFD and municipal social media.

As the FireSmart program in Oliver is new and expanding, the FireSmart Coordinator, OFD, and municipal staff will need to assess which methods of public engagement are most successful and which methods are not suitable for the Town. FireSmart education is not a one-size-fits-all approach, therefore it will be valuable for the Town to continue to explore various education initiatives. The prevalence of wildfire in the South Okanagan has residents "used" to smoke and interface wildfires, but there is room for improvement when it comes to the delivery and uptake of FireSmart education and the dissemination of FireSmart basics within the Town.

Action Planning

It is recommended that the Town of Oliver continue to evolve their FireSmart program – maintaining or expanding resource allocation to education initiatives, while testing and adjusting these in response to community uptake. When targeting a specific neighbourhood or region of Oliver, educational material should consider the unique conditions in that neighbourhood and ensure that the educational messaging is tailored to that group / area. For example, a neighbourhood with few structural vulnerabilities but extreme landscaping / vegetation hazard should be communicated with differently than an older neighbourhood with vulnerable structures and outbuildings, while a neighbourhood in the interface with Oliver Mountain can be communicated with differently than a neighbourhood in the middle of Town.

Free FireSmart resources (e.g., Homeowners Manual, “Tips to FireSmart Your Home”, the FireSmart Landscaping Guide, and the FireSmart Begins at Home mobile app) are digestible for all residents, while including FireSmart into local school curriculums can increase awareness in youth and allow this information to be brought home. As fire is an integral ecosystem component in the South Okanagan, teaching youth about how to understand, co-exist with, and manage fire can be an important step in achieving community resilience. Sharing FireSmart information through known community leaders and established organizations (e.g., stratas, mobile home groups, neighbourhood associations) may be the most efficient way to target at-risk areas and grow initiatives such as the FireSmart Neighbourhood Recognition Program (FSNRP). Adding a FireSmart dimension to initiatives already popular with community members such as the Roots & Fruits Expo, Earth Day Cleanup, or Unlimited Yard & Garden Waste weeks is another suggested option for enhancing FireSmart public education in the Town of Oliver.

As described in Table 9, four of the previous five large wildfire events in the Oliver area have been human-caused, which stresses the importance of communicating fire danger ratings during periods of high and/or extreme fire weather. This information needs to be disseminated through multiple channels in order to reach both residents and tourists alike. Additionally, the language and messaging around FireSmart and fire prevention should be consistent and coordinated with regional partners (i.e., OIB and the RDOS). Both OIB’s and the RDOS’ most recent CWPPs list FireSmart education initiatives as high priority action items (see Appendix B: Review of 2023 Osoyoos Indian Band CWPP and Appendix C: Review of 2020 RDOS CWPP).

A summary of recommendations related to FireSmart Education is detailed in the Executive Summary in Table 1: The Town of Oliver’s CWRP Action Plan.

5.2 LEGISLATION AND PLANNING

Description

Legislation and planning regulation are effective tools for reducing wildfire risk, even more so in smaller communities versus large municipalities or regional districts due to ease of communication and enforcement. Given the realized and projected growth within Oliver and the reoccurrence of wildfire in the South Okanagan, land use planning tools can be used to reduce wildfire risk by growing and developing with wildfire in mind. Though legislation, planning, and development often go hand-in-hand, development-specific considerations will be reviewed in Section 5.3. Reviewing bylaws and various community plans²² through a wildfire lens to assess where they inadvertently promote conditions that may contribute to fire intensity or fire spread, and determining where bylaws or plans can be updated or strengthened to reduce wildfire risk within the Town can help Oliver grow to be a more wildfire resilient community. Potential generalized examples of this in Oliver include:

- Regulations to enforce FireSmart building materials on new builds and renovations;
- Regulations to ensure new buildings are adequately offset from natural areas;
- Regulations to ensure that fire hazards are mitigated in natural areas next to new developments;
- Bylaws to prevent highly-flammable vegetation being planted in new developments (specifically close to homes);
- Regulations to ensure that municipally owned natural spaces are maintained in a low fire-hazard state.

Analysis

Through the Town of Oliver's Fire Control Bylaw (which addresses open burning prohibitions) and Emergency Program Bylaw, the Town is proactively tackling emergency preparedness, response, and fire prevention through legislation. These and additional bylaws that relate to wildfire prevention and wildfire resilience are reviewed in Table 12 on the following page.

²² Various municipal plans that relate to wildfire resilience were reviewed in Section 2.

Table 12: List of bylaws within the Town of Oliver that relate to wildfire prevention and wildfire resilience.

Town of Oliver Bylaw	Description and <i>Relationship to CWRP</i>
Fire Control Bylaw No. 1369	<p>Bylaw 1369 regulates the authorities and responsibilities of the Fire Chief and OFD with respect to fire hazards, fire safety planning, fire protection equipment, outdoor burning, etc. This bylaw allows the Fire Chief to enforce multiple measures that can reduce wildfire risk and improve wildfire resilience:</p> <ul style="list-style-type: none"> • <i>The Fire Chief can require property owners to abate or remove a fire hazard – this has proven difficult to enforce, but forms the basis for notifying individuals of non-FireSmart conditions on their property and achieving voluntary compliance.</i> • <i>Prohibits the accumulation of combustible materials on a property, though this is rarely enforced due to a lack of clarity in the definition of “combustible”.</i> • <i>Prohibits campfires and the majority of open burning throughout the Town, and sets restrictions on agricultural open burning throughout the Fire Protection Area (FPA). This reduces the likelihood of human-caused wildfire ignitions, though unregulated open burning proves to be an annual concern that ties up fire suppression resources in the spring and fall in the FPA.²³</i>
Emergency Program Bylaw No. 1361	<p>Bylaw 1361 establishes and regulates Oliver’s Emergency Management Organization, which was further reviewed in Section 2.1.</p> <ul style="list-style-type: none"> • <i>The risk of wildfire will be reviewed annually by Council – discussing plans to prepare for, respond to, and recover from a wildfire emergency.</i> • <i>Provides room for emergency response exercises and training – both of which are recommendations in this CWRP.</i>
Subdivision and Development Servicing Standards	<p>This set of standards ensures that new developments and subdivisions within the Town of Oliver have adequate water and access to water for fire suppression, and that access for firefighting vehicles is adequate.</p> <ul style="list-style-type: none"> • <i>Water for fire suppression and access throughout the Town boundaries were not noted as a concern for OFD. OFD has adequate access throughout the Rural Fire Protection District and OIB #1 due to versatile firefighting vehicles in their fleet.</i>
Solid Waste Services Bylaw No. 1292	<p>Bylaw 1292 regulates the services and responsibilities of the Town for collecting solid waste (i.e., leaves, lawn clippings, branches, twigs, shrubs, etc.) from properties.</p> <ul style="list-style-type: none"> • <i>This provides an easy option for residents to have vegetative debris removed from their properties, where they have cut this material in order to reduce their fire risk. Oliver provides regular yard waste collection and hosts numerous events throughout the year to expand this program.</i>
Good Neighbour Bylaw No. 1357	<p>Bylaw 1357 outlines the regulations and Fire Chief’s authority regarding fireworks, and regulations related to property maintenance.</p> <ul style="list-style-type: none"> • <i>Reduces the likelihood of human-caused wildfires from fireworks, and provides the Fire Chief and Bylaw services the authority to enforce property maintenance on vacant properties that have accumulated combustible materials or vegetation. This Bylaw has historically been enforced for the removal of dead trees and vegetation from properties.</i>

²³ FireSmart BC and the BCWS have published Open Burning Practices for Farmers and Ranchers, which can be valuable to share: <https://firesmartbc.ca/resource/open-burning-practices-for-farmers-and-ranchers/>

Action Planning

By pursuing changes to various pieces of legislation or increasing the enforcement / communication of pre-existing bylaws, the Town of Oliver can work to become a more wildfire resilient community as it continues to grow. Wildfire risk and preventative measures are loosely referenced in Oliver's current Official Community Plan, but few pieces of current legislation enforce FireSmart principles which has resulted in considerable fire risks throughout and adjacent to multiple neighbourhoods. The bylaws described and/or recommended for updating should not be considered the complete list of laws that should be reviewed and updated, but rather a guide to how FireSmart principles can be viewed and actioned through municipal legislation and land use planning. If updating / creating bylaws regarding building forms, regulation, landscaping, and zoning are not a direction that the Town of Oliver is wanting to take, the same goals can likely be reached via a wildfire hazard Development Permit Area which is discussed below in Section 5.3.

Recommendations and action items that relate to legislation and planning that the Town of Oliver can implement are detailed in the Executive Summary in Table 1: The Town of Oliver's CWRP Action Plan.

5.3 DEVELOPMENT CONSIDERATIONS

Description

Embedding FireSmart practices and considerations into development should be a priority for the Town of Oliver. Oliver is a growing community with a number of construction projects for residential and community buildings currently underway. Wildfire risk factors that can be planned for and regulated through the development process include:²⁴

- Location of development in relation to vegetation, slopes, and terrain features that either reduce or increase wildfire threat;
- Type of construction materials on structures, projections, and outbuildings;
- Landscaping requirements throughout the FireSmart Home Ignition Zone;
- Structure density;
- Access and traffic circulation patterns;
- Availability and adequacy of water supply.

Analysis

Many of the newer homes and current developments within Oliver have inherently been built using FireSmart materials and design principles (e.g., fiber-cement siding, asphalt shingle roofs), though the majority of older homes and buildings throughout the community generally have low FireSmart compliance. FireSmart compliance combines both structural and landscaping attributes – both of which can be controlled for at the development phase. The most commonly noted non-compliance issues of older homes includes wooden or vinyl siding, wooden deck(s) with vegetation and debris underneath, and combustible debris or materials stored directly adjacent to the building (e.g., firewood, construction materials, etc.). Close to both old and new builds, the presence of highly-flammable vegetation is common, either as the result of landscaping decisions (e.g., cedar hedges) or a lack of maintenance (e.g., dead / decadent shrubs). Highly-flammable or unmaintained vegetation can provide a continuous pathway between buildings for either a structural fire or a wildfire to spread through.



²⁴ FireSmart Canada and the Intact Center on Climate Adaptation have developed a Wildfire-Resilience Best Practice Checklist for Home Construction, Renovation and Landscaping. Information in here can be referenced when deciding on what to incorporate in a Wildfire Development Permit Area or enforce through legislation. Available at: <https://firesmartbc.ca/resource/wildfire-resilience-home-construction-renovation-and-landscaping-checklist/>

The Town of Oliver currently does not have a mechanism to force new developments to consider wildfire risk. The idea of considering wildfire risk is presented in the *Hazard Lands objectives and policies* in Oliver's Official Community Plan, but there is currently no formal process or requirement by the Town of Oliver to sufficiently identify, address, and mitigate wildfire hazards for new developments. No fuel management or hazard abatement treatments have occurred adjacent to existing development in Oliver, nor does a formal process or requirement exist to reduce the threat to new developments.

Action Planning

In future Official Community Plan updates or through bylaw changes, the Town of Oliver should consider adopting language and regulations strictly related to wildfire risk reduction in developments. As per the OCP, there is a 33% / 67% split between single-family and multi-family residential development capacity in the Town, therefore, if future development is to be informed by FireSmart principles, it will need to ensure that regulations cover multiple kinds of development. A powerful tool that can be employed to accomplish FireSmart development is through the enactment of a Wildfire Hazard Development Permit Area (DPA).²⁵ The following aspects should (at minimum) be considered in any OCP reviews and/or Wildfire Hazard DPA development:²⁶

- 1) Establish DPA objectives (e.g., minimize risk to structures and people from wildfires, minimize risk to natural areas surrounding communities, and conserve the visual and ecological assets of the natural areas surrounding communities, etc.);
- 2) Where possible, it is recommended to *mandate* FireSmart construction materials and landscaping;
- 3) Engage residents in the DPA development process to educate, inform, and allow for input. This can be accomplished in a variety of formats, including, but not limited to, workshops, informational sessions, or open houses.

Jurisdictions surrounding the Town of Oliver (i.e., Osoyoos Indian Band and the RDOS) currently do not have Wildfire Hazard DPAs in place. Electoral Area A of the RDOS received wildfire hazard mapping and guidelines for a Wildfire Hazard DPA in 2020, but it was deemed that the implementation of this DPA was overly costly and ineffective.²⁷ The Regional District of Central Okanagan, the City of Kelowna and the City of Penticton have all adopted Wildfire DPAs of varying spatial scales and with varying requirements.

Recommendations and action items that the Town of Oliver can implement to embed FireSmart practices and considerations into development is detailed in the Executive Summary in Table 1: The Town of Oliver's CWRP Action Plan.

²⁵Institute for Catastrophic Loss Reduction, Development Permits: An Emerging Policy Instrument for Local Governments to Manage Interface Fire Risk in a Changing Climate. Accessed from: https://www.iclr.org/wp-content/uploads/2018/05/Development-Permits_2018.pdf

²⁶ Additional development-related information accessible at: FireSmart Canada Home Development Guide: https://firesmartcanada.ca/wp-content/uploads/2019/10/FireSmart_Canada_Home_Development_Guide.pdf and Headwaters Economics - Building a Wildfire-Resistant Home, Codes & Costs: <https://headwaterseconomics.org/wildfire/homes-risk/building-costs-codes/>

²⁷ RDOS Wildfire DPA Exploration Project: <https://www.rdos.bc.ca/development-services/planning/strategic-projects/wildfire-dp/>

5.4 INTERAGENCY COOPERATION

Description

As the Town of Oliver shares borders with OIB, the RDOS, and undeveloped Crown Land, and the OFD holds a mutual-aid / response agreement with these areas, successful interagency cooperation is key to achieving wildfire resilience. These jurisdictional borders often contain flashy and continuous vegetation that don't have physical barriers or fuel breaks to fire spread, therefore collaborative pre-incident wildfire mitigation work and practiced wildfire response can make all the difference for a successful emergency response. Identifying and linking stakeholders, land managers, and emergency response personnel within the Town of Oliver and the South Okanagan as a whole can help to reduce wildfire risk collaboratively, increase funding opportunities, and allow the Town of Oliver to obtain valuable local knowledge.

Analysis & Action Planning

At the time of writing this CWRP, the Oliver FireSmart Coordinator sits on a regional (Okanagan-wide) FireSmart planning table in which various jurisdictions and response agencies discuss wildfire resilience initiatives. Oliver's FireSmart Coordinator has a desire to create a sub-regional Community FireSmart Resiliency Committee (CFRC) to reflect the unique conditions of the South Okanagan, which is recommended through this CWRP. A CFRC reflects the key planners and responders most involved in local FireSmart initiatives, wildfire resiliency planning, and wildfire and emergency response. While FireSmart priorities can vary between jurisdictions or internal departments, it is often beneficial to discuss wildfire resiliency initiatives with multiple parties. Conversations, planning tables, and wildfire resilience activities can include a number of Town departments (e.g., linking land use planners and emergency personnel), OIB emergency personnel and foresters, regional government staff, the Ministry of Forests, and the BC Wildfire Service (at a minimum). Table 13 below details recommended agencies that can be involved in an external CFRC with the Town of Oliver, which themselves could be represented by their FireSmart Coordinator, Fire Chief, and Emergency Program Manager.

Table 13: Potential agencies to be involved in a CFRC alongside the Town of Oliver.

Agency	Title	Role
Osoyoos Indian Band	Chief & Council / Head of Forest Operations	Discuss FireSmart, wildfire resilience, and emergency preparedness initiatives at Osoyoos Indian Band and seek collaboration where possible.
Ministry of Forests	Land & Resource Specialist	Discuss Crown Land Wildfire Risk Reduction efforts adjacent to Oliver and/or in the South Okanagan.
Regional District of Okanagan-Similkameen	FireSmart Coordinator	Discuss RDOS FireSmart initiatives, successes, and challenges and seek collaboration where possible.
Local Fire Departments – Willowbrook, Osoyoos, Okanagan Falls	Fire Chief / Deputy Fire Chief	Discuss FireSmart initiatives within their Fire Protection Area (if involved), plan activities alongside the Town of Oliver, ensure consistent FireSmart messaging, and discuss upgrades to their response capacity.
BC Wildfire Service	Wildfire Officer / Wildfire Technician	Discuss wildfire risk and changes to wildfire response throughout the Penticton Fire Zone, and any planned mitigation works.

Local Stakeholders and Land Managers

Forestry and other land management activities can either increase wildfire risk (through fuels accumulations and unsafe work practices) or decrease wildfire risk (removal of combustible fuels within managed areas, reforestation techniques/planting, access management, etc.). Given the dry shrub-steppe ecosystems throughout the WUI of Oliver, traditional forest harvesting does not have an impact in the AOI of this CWRP. Industrial or commercial activities that do have an impact on wildland fuels in the AOI include cattle grazing and right-of-way management by Fortis, the MOTI and the Town of Oliver. Barrington Ranch Ltd. holds an active range tenure on Oliver Mountain that overlaps with some of the highest fire threat areas surrounding Oliver, which is grazed by cattle annually in the spring (generally late-April – mid-May, for approximately 72 Animal Unit Months). Grazing can help to reduce wildfire risk through the physical removal of grass, shrub, and herbaceous fuels, while also increasing exposed mineral soil and mixing / compacting woody debris with mineral soil which lessens the likelihood of fire ignition and spread. Targeted grazing projects to support wildfire risk reduction have been performed in recent years in Southeast Kelowna, the Munro Lake Forest Service Road (Peachland), and the Garnet Valley (Summerland). Multiple road and transmission line right-of-ways throughout and adjacent to Oliver contain grass and/or shrub fuel loads which were inconsistently maintained when field work was performed for this CWRP. The risk of fire ignition is also heightened in these areas due to vehicle or recreational traffic, and values at risk (i.e., homes, commercial buildings, electrical infrastructure) are often directly adjacent. Right-of-way management to reduce wildfire risk should be discussed with these groups annually.



Figure 11: Examples of poorly maintained right-of-ways with accumulations of grass, shrub, and dead material (left, Bellevue Drive, mix of residential and Fortis right-of-way; right, pipeline and road right-of-way near Spillway Road).

Recommendations and action items that the Town of Oliver can implement to grow interagency relationships and cooperation to improve wildfire resilience are listed in the Executive Summary in Table 1: The Town of Oliver's CWRP Action Plan.

5.5 CROSS-TRAINING & FIRE DEPARTMENT RESOURCES

Description

All Town of Oliver staff who are expected to participate in the development and implementation of this plan or participate in wildfire response and recovery should be appropriately trained. Cross-training ensures that municipal staff are aware of wildfire specifics and wildfire response, that structural firefighters are experienced and trained with wildfire behaviour and suppression, and that wildfire fighters are experienced and trained with structure protection. Emergency Operations Center roles within the Oliver Emergency Program are set and a number of mutual aid agreements are currently in place between OFD and local fire departments, but expanding the emergency response training of Oliver staff will allow for additional involvement in emergency events and transparency with the community.

Analysis

Oliver and District Fire Department (OFD) is a highly experienced volunteer team with considerable training and exposure to interface wildfire suppression that is dedicated to enhancing their wildland fire protection skillsets and equipment for both local and provincial assistance. At the time of writing, OFD has 30 individuals with wildland-specific training (i.e., S-100 & S-185 or equivalent), with new members trained on an annual basis. Twelve members are trained in the deployment of structure protection equipment (WSPP-115), with an additional five to be trained in 2024. FireSmart-specific training is lacking within OFD and among Oliver municipal staff, as only one individual currently has Local FireSmart Representative or Wildfire Mitigation Specialist training.

The OFD is generally well equipped for wildland response as they have an F-350 that is equipped with wildland gear, as well as a side-by-side (Polaris XP4) that has a mounted fire suppression unit. Wildland firefighting gear has been obtained for all members of the fire department. In addition, OFD has acquired a full Type II structure protection unit (SPU) and is in the process of building a second Type II unit over the following three years. Each Type II unit is capable of covering approximately 20 homes in an urban area and 5 – 7 in a rural area. Members of the OFD have been involved with major interface wildfires in recent years (both within their Fire Protection Area and through mutual aid / provincial deployments) – most notably Upper Park Rill Creek (2023), Nk'Mip Creek (2021), and Oliver / Wilson Mountain and Testalinden Creek (2015). The OFD had 21 combined brush fire callouts in 2022 (12 in rural areas, 9 on OIB #1) and 14 in 2023 (12 in rural areas, 2 on OIB #1). Mutual aid responses with Osoyoos and Willowbrook Fire Departments have generally been successful, but the OFD has noted pervasive challenges with communication in these events. The OFD has also participated in a number of inter-agency training sessions that are wildfire specific, most recently in the spring of 2023 in Willowbrook and at the Dominion Radio Astrophysical Observatory (DRAO).

Action Planning

OFD should continue to build-out their wildland fire capacity through training and equipment purchases, and increase the number of training sessions that are held with mutual aid departments and/or the BC Wildfire Service. FireSmart specific training within the OFD is an excellent way to promote and enhance FireSmart education and outreach amongst Oliver staff and community members, as members of the OFD are trusted and respected throughout the Town. In the event of an interface wildfire, prior uptake of FireSmart programs that led to a decreased risk on private properties will allow the OFD to focus on fire suppression and perform structure protection more safely and effectively. The following types of FireSmart training are offered through FireSmart BC:

- Local FireSmart Representative (LFR) Training:
 - Purpose is to assist neighbourhood leaders and fire professionals to deliver basic Home Ignition Zone assessments, and implement the FireSmart Canada Neighbourhood Recognition Program.
- Wildfire Mitigation Specialist (WMS) Training:
 - Purpose is to train individuals to deliver more detailed assessments than basic Home Ignition Zone assessments. WMS' are responsible for the facilitation of the FireSmart Home Partners Program and other related programs.
- FireSmart Neighbourhood Champion Training:
 - Conducted by LFRs, its purpose is to prepare community champions (neighbourhood leaders) to take initiative and begin the formal process of attaining FireSmart Community recognition status.

In addition to increased training for the OFD, response training opportunities for municipal staff (especially those involved with emergency response) include:

- Incident Command System - Level 100
- Basic Fire Suppression and Safety - S100

The UBCM CRI FCFS program has included yearly grant funding that can be applied toward governments hiring a FireSmart Coordinator (which Oliver currently utilizes) and FireSmart Crew Members, something that Oliver should continue to consider for leading their FireSmart program. Recommendations and action items that the Town of Oliver can implement to grow cross-training opportunities and fire department resources are listed in the Executive Summary in Table 1: The Town of Oliver's CWRP Action Plan.

5.6 EMERGENCY PLANNING

Description

Deployment of provincial wildfire resources occurs based on the Provincial Coordination Plan for Wildland Urban Interface Fires,²⁸ which may result in BCWS resource availability becoming scarce when several wildfire emergencies are taking place throughout the province. Therefore, local government wildfire preparedness and resource availability are critical components of community wildfire resilience – individuals and agencies need to be ready to act. Wildfires that threaten human life, structures, and critical infrastructure are extremely complex and dynamic incidents to respond to, which can involve multiple concurrent emergency response events. All phases of an emergency response (mitigation, preparation, response, and recovery) should have significant pre-planning in place, or a WUI incident is likely to overwhelm resources and render them ineffective. Figure 12 below demonstrates important considerations for each of these four phases:

Mitigation

- A shared responsibility between various land managers and private property owners - mitigating wildfire risk prior to a fire event (includes FireSmarting homes and properties, performing vegetation management in public spaces, etc.)

Preparation

- Includes pre-incident planning (see *Analysis & Action Planning* below) by Emergency Management personnel and fire response resources.
- Includes the preparedness of homeowners and business owners prior to an evacuation (e.g., use of the FireSmart Evacuation Checklist, and preparation of "ready-to-go" kits).

Response

- Includes the capable response by municipal and/or regional Emergency Operations Center staff.
- Includes the capable response by Oliver and District Fire Department and/or mutual-aid partners, and available BCWS resources.
- Includes the dissemination of emergency information with the public.
- Includes the provisions made to protect Public Health in the event of a wildfire (i.e., mitigating smoke impacts especially to vulnerable populations).

Recovery

- Outlines the ability of the community to respond quickly to values that are affected by an interface wildfire.
- Required recovery efforts will likely decrease with pre-incident improvements in mitigation, preparation, and response.

Figure 12: Generalized description of the four phases of emergency response as they relate to a wildfire emergency in Oliver.

The Town of Oliver's Emergency Management Plan and Emergency Program Bylaw was referenced at the time of writing this CWRP, which provides a comprehensive local guide to emergency response procedures throughout the community. See Section 2.1 for additional information on how the Emergency Management Plan relates to this CWRP.

²⁸ Provincial Coordination Plan for Wildland Urban Interface Fires. 2016. Retrieved from: https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/emergency-preparedness-response-recovery/provincial-emergency-planning/bc-provincial-coord-plan-for-wuifire_revised_july_2016.pdf

Analysis & Action Planning

Wildfire emergencies are increasingly common in the South Okanagan, with evacuation orders and/or evacuation alerts being issued throughout the region in most fire seasons. Residents in Oliver receive emergency information through the *Voyent Alert* app or provincial channels, and both emergency program and OFD staff are invested in improving their emergency response capability throughout the area. Wildfire-specific pre-incident plans are a compilation of essential fire management information that can be used to save valuable time during fire suppression operations. During a busy wildfire season, provincial resources can be stretched thin and any information that local governments can provide to BCWS or assisting structural fire department crews is helpful. Pre-incident plans should be developed and tested using tabletop simulations, and if necessary, revised prior to every fire season. BCWS should be involved in this process to ensure that any mapping done as part of the regional Fire Management Planning process is not unnecessarily duplicated. These plans and maps (some of which are wholly or partially developed as part of this CWRP) should consider at a minimum:

- **Command:** Authority, structural protection needs, management constraints, etc.
- **Operations:** Helicopter base locations, water sources / intakes, fire control line locations and natural barriers, crew/personnel safety zones and staging locations, etc.
- **Logistics:** Base camp / EOC locations, roads and trails, utilities (CI), communications, etc.
- **Planning:** Maps (Structures, critical infrastructure, land status, vegetation and fuel, hazards, archaeology and environmentally sensitive areas, water sources, access/egress, evacuation route plans, etc.)

As part of pre-incident planning, the Town of Oliver should consider developing local daily action guidelines based on the fire danger rating. Table 14 on the following page provides a template that can be tailored specifically to Oliver, outlining actions that staff can take as fire danger levels change throughout the fire season.²⁹

²⁹ CRI FCFS 2024 CWRP supplemental instruction guide.

Table 14: Example of a Wildfire Response Preparedness Condition Guide

FIRE DANGER RATING	ACTION GUIDELINES
LOW	<ul style="list-style-type: none"> All Oliver staff on normal shifts. Direct community members to BCWS (or the Town's FireSmart page) for fire danger rating info.
MODERATE	<ul style="list-style-type: none"> All Oliver staff on normal shifts. Information gathering and dissemination through Oliver's internal or external CFRC. Regional fire situation evaluated. Direct community members to BCWS (or the Town's FireSmart page) for fire danger rating info, update fire danger signs in the community.
HIGH	<ul style="list-style-type: none"> All Oliver staff on normal shifts. Regional fire situation evaluated. Oliver EOC staff notified of Fire Danger Rating. Daily fire behaviour advisory issued. Establish weekly communications with the internal or external CFRC. Update fire danger rating signs in the community and/or post updates on social media and Oliver's FireSmart page.
EXTREME	<ul style="list-style-type: none"> Same conditions as 'High' Danger Rating. Oliver EOC staff considered for level 1 activation standby. Wildfire Incident Command Team members considered for stand-by / extended shifts.
FIRE(S) ONGOING	<ul style="list-style-type: none"> All conditions apply as for Extreme (regardless of actual fire danger rating). Mobilize EOC support if evacuation is possible, or if fire event requires additional support. Implement Evacuation Alerts and Orders based on fire behaviour prediction and under the direction of the EOC or BCWS.

Wildfire smoke is a frequent hazard throughout the South Okanagan, whether from fires burning in British Columbia or drifting from the United States. The impact that wildfire smoke can have on public health is an emerging topic of scholarly research, but it is generally well understood that fine particulate matter from wildfire smoke (i.e., PM_{2.5}) has a wide range of negative health effects. The high proportion of residents in Oliver that are over the age of 65 (37% of the population) stresses the importance of reducing exposure levels to wildfire smoke, as seniors or individuals with pre-existing illnesses or chronic health conditions are generally at the highest risk of smoke-related health effects. There are multiple ways to reduce an individual's exposure to wildfire smoke, which can be achieved personally and/or facilitated through municipal programs.³⁰ Recommendations and action items related to emergency planning are listed in the Executive Summary in Table 1: The Town of Oliver's CWRP Action Plan.

³⁰ The Government of Canada has published guidelines on wildfire smoke and its relationship with public health, including ways to prepare for smoke events and protect your physical and mental health: <https://www.canada.ca/en/services/health/healthy-living/environment/air-quality/wildfire-smoke.html>

5.7 VEGETATION MANAGEMENT

As discussed in Section 4, fuel is the only aspect of the fire behavior triangle that can be realistically modified to reduce wildfire threat. Fuel or vegetation management reduces potential wildfire intensity and ember exposure to people, structures, and other values through the manipulation of both natural and cultivated vegetation within or adjacent to a community. A well-planned vegetation management strategy can greatly increase fire suppression effectiveness and reduce damage to property and values. Vegetation management can largely be accomplished through two different activities:

1. *Residential-scale FireSmart*: The removal, reduction, or conversion of flammable plants to create more fire-resistant areas in the FireSmart Immediate Zone, Intermediate Zone, and Extended Zone. Efforts should start closest to the value (i.e., structure) and move outwards.
2. *Fuel management treatments*: The manipulation or reduction of living or dead forest, shrub and grassland fuels to reduce the rate of spread and head fire intensity and enhance likelihood of successful suppression. These treatments are often located outside the Home Ignition Zone to strategically decrease fire behaviour at the landscape scale.

5.7.1 RESIDENTIAL-SCALE FIRESMART

The Immediate Zone, Intermediate Zone, and Extended Zone are collectively referred to as the Home Ignition Zone (HIZ; see Figure 9). The names of these Zones changed in 2023 and had previously been referred to as the Non-Combustible Zone, Priority Zone 1, and Priority Zone 2, respectively. Throughout Oliver and in adjacent rural-residential areas, low compliance was observed to FireSmart vegetation management throughout the HIZ. The most common FireSmart vulnerabilities that were noted for residential structures and community infrastructure were:

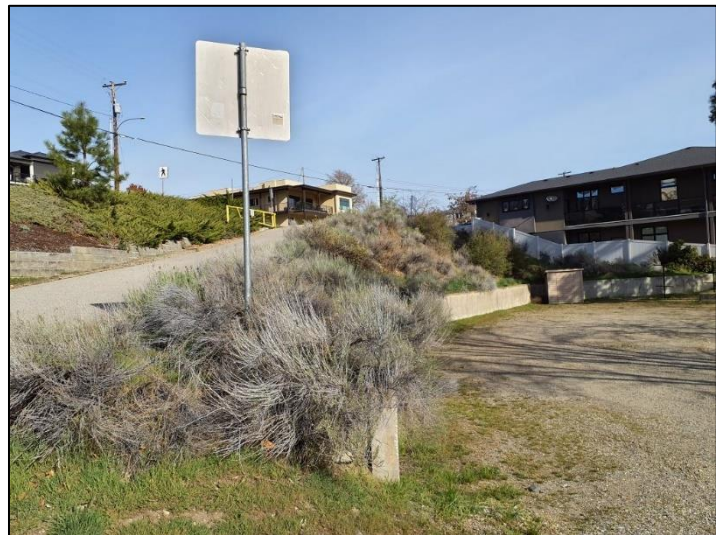
- Highly flammable landscaping (e.g., cedar / juniper hedges, dead hedges / shrubs) in the Immediate and Intermediate Zones;
- Overgrown / unmaintained grass and shrubs in the Immediate and Intermediate Zones;
- Low drooping conifer trees, often in contact with the home / building;
- Dry and dead vegetation and/or combustible materials stored underneath exposed wooden decks;
- Wooden sheds / outbuildings within the Intermediate Zone of the main house, which are often much less FireSmart than the house itself.

Town of Oliver staff (potentially using a contractor or other hired FireSmart personnel) could begin to decrease the community's wildfire exposure by assisting with vegetation management and debris disposal, prioritizing areas by importance (see Section 3.2 – Values at Risk) and/or fire threat (see Section 4.4.1 – Wildfire Threat Class Analysis). Tactically, as fire hazards (i.e., vegetation) are often similar at the neighbourhood scale and there are logistic efficiencies with performing continuous work in one geographic area, the Town of Oliver should design and advocate for fuel management programs at the neighbourhood scale. Hazards between individual HIZs often overlap and span across multiple parcels, therefore neighbourhood-level resilience will often require coordination by municipal staff and buy-in from individual property owners.

Additionally, multiple vegetated slopes and vacant properties throughout Oliver were noted to have overgrown / unmaintained grass and shrub loads – the majority of which are on private property (e.g., slopes west of the hospital, east of Salamander Ave & Meadows Drive, west of Sawmill Road, adjacent to the Okanagan River dyke trail, and vacant properties west of Salamander Ave & Meadows Drive). Notification of this vegetation hazard should be communicated to property owners, and any barriers to reducing this hazard should be discussed.



Figure 13: Examples of hazardous vegetation conditions on vacant private lots (top – dead shrub and grass material and dumped combustibles) and in municipal parks (bottom – dead shrub material and junipers on slopes in Rotary Park).



“Residential-Scale” FireSmart programs should also be applied to municipally owned infrastructure, especially pieces identified as critical infrastructure or community assets. Both the construction materials of these buildings and the vegetation/landscaping surrounding are equally important to consider – the structure itself may not be overly susceptible to fire but the vegetation surrounding it could be, creating a barrier to access if ignited and also a vector for fire to spread to other surrounding infrastructure.

Though the end goal of any vegetation management is a reduced fire risk, there are additional ecosystem values that should be managed for to ensure that the health of the surrounding ecosystems is not being compromised through treatment (e.g., wildlife habitat, water quantity and quality, biodiversity, invasive species management, slope stability, etc.). It is recommended that any neighbourhood-scale FireSmart plans be developed by a Registered Professional Forester / Registered Forest Technician with experience in BC interior fuel management, FireSmart, and fire suppression / emergency planning.

5.7.2 FUEL MANAGEMENT TREATMENTS

Fuel management treatments are often designed to keep wildfires as low-intensity surface fires by removing the potential for explosive fuel-driven fires. This reduction in potential fire behaviour can provide a safe and reliable anchor point for firefighting crews.³¹ While the lack of trees surrounding Oliver makes a traditional “crown fire” not a notable concern, the grass and shrub fuels that surround the Town are conducive to high rates of spread and high fire intensities. Recent urban conflagrations in Lytton and Boulder County, Colorado demonstrate the catastrophic effects that grass / shrub fires can have. Given the build-up of decadent shrub vegetation on portions of Oliver Mountain and OIB #1 in the WUI, local wildfire professionals have advocated for the use of regular spring or fall prescribed fires to help abate this fuel load under controlled settings. The re-introduction of regular fire to the landscapes surrounding Oliver will likely also provide ecological benefits to the many red and/or blue-listed species at risk that rely on these ecosystems. Prescribed burning is likely the most cost-effective fuel management tool in the South Okanagan, and it also provides useful training opportunities for the OFD, BCWS, and various other response agencies.

Three separate fuel treatment units (FTUs) are being proposed to the south / west of Oliver as part of this CWRP, listed in Table 15 and displayed on Map 9. The majority of these FTUs are located outside of Oliver’s municipal boundaries and on Crown Land, therefore planning for these FTUs and implementation of the work can be brought forth to the Ministry of Forests and the BC Wildfire Service. Initial consultation with Osoyoos Indian Band has shown favour for prescribed burning / cultural fire projects for wildfire risk reduction and ecosystem restoration, therefore a partnership with OIB to advocate for this treatment regime will be strong. If prescribed burning / cultural fire is not desirable or is proving to not be feasible in the area, alternative fuel management methods for shrub fuels could be pursued, while targeted cattle grazing could be a potential option for controlling grass fuel loads.

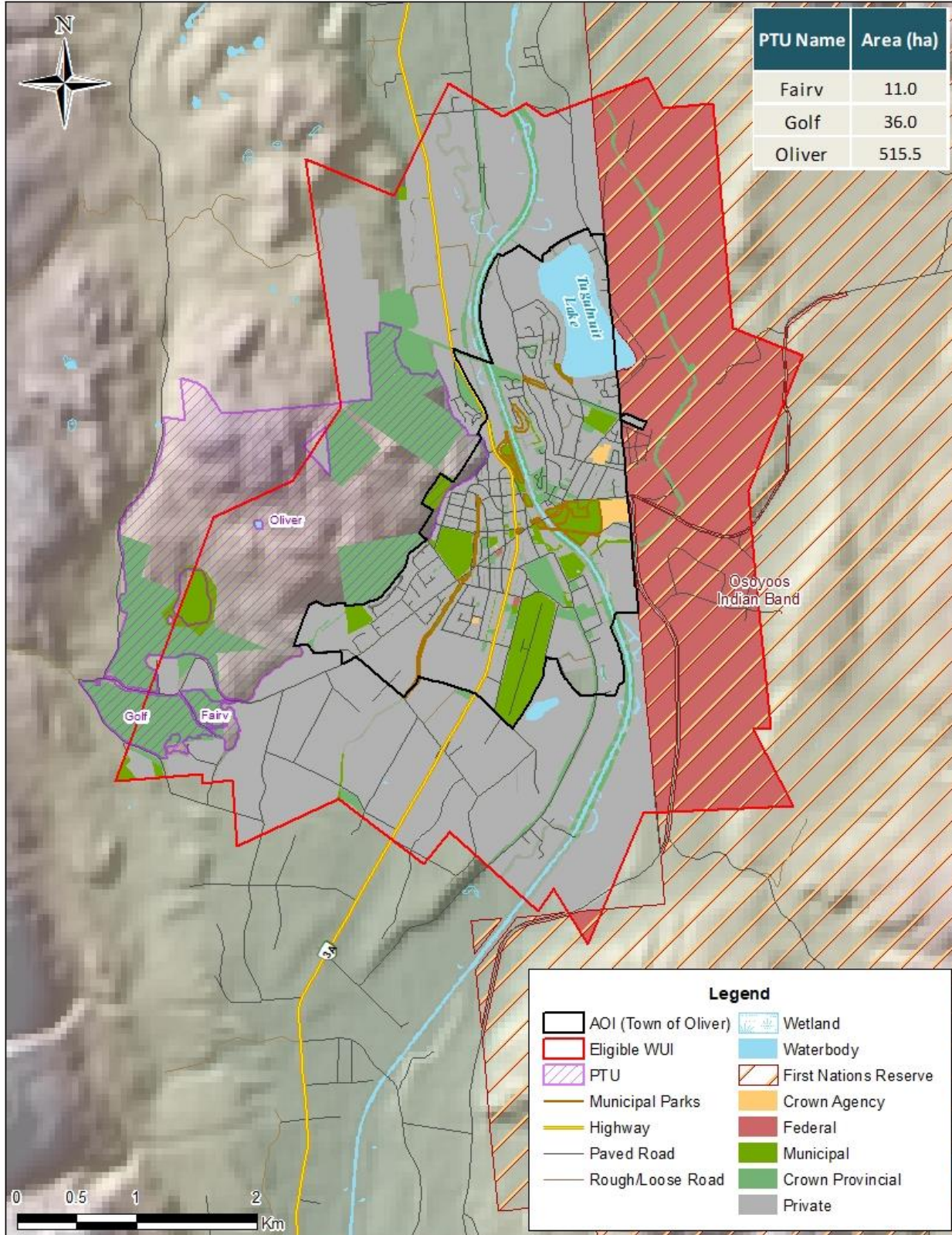
Recommendations and action items related to vegetation management within and adjacent to the Town of Oliver are provided in the Executive Summary in Table 1: The Town of Oliver’s CWRP Action Plan – organized by Fuel Management Treatments, Residential FireSmart, and Critical Infrastructure & Community Assets.

³¹ BC Wildfire Service. 2024 Fuel Management Practices Guide. https://www2.gov.bc.ca/assets/gov/public-safety-and-emergency-services/wildfire-status/prevention/fire-fuel-management/fuels-management/2024_fuelmanagementpracticesguide1.pdf

Table 15: Fuel treatment units identified for prescribed burning regimes.

FTU Name	Total Area (ha)	Wildfire Behaviour Threat ³² (ha)				Description / Overlapping Values	Treatment Rationale
		Extreme	High	Mod	Low		
Oliver	515.5	115.9	214.4	5.2	1.0	The Oliver FTU is the largest and covers the area to the north / east of Fairview Road, surrounding the Town’s wastewater treatment facilities and lagoons. Private property lines were chosen as the northern boundary of this FTU, but it is likely that a pre-existing fuel break could be utilized at the FMP / Burn Plan stage. This area overlaps a range tenure (RAN077334) held by Barrington Ranch Ltd., a recreation polygon (REC240240) managed by the Ministry of Forests / Southern Okanagan Dirt Bike Club, the South Okanagan Wildlife Management Area, and habitat for multiple species / ecosystems at risk. Multiple cliff / rock features are located within the FTU area but were not able to be spatially delineated.	All three of these FTUs contain areas with dense decadent shrub loads which pose potential high-fire intensities when burned under drought conditions. These high intensities can also be damaging to the soil and various habitat features. Overgrown vegetation is commonly found directly adjacent to residential properties. All three areas are roadside and/or contain hiking / off-road vehicle networks which heightens the chance of ignition. Portions of the Oliver FTU were burned in 2015 and now have a moderate fuel hazard, while a small portion burned in 2023 has a low fuel hazard. Regularly occurring low-intensity prescribed fires in these areas can be a cost-effective way to manage vegetation, reduce wildfire risk, and restore natural ecosystem disturbance regimes.
Golf	36.0	0.0	6.6	14.2	0.1	The Golf FTU is between Fairview Road and the Old Golf Course Road, west of Knippleberg Road. This area overlaps with red-listed species and ecosystem at risk polygons for <i>Taxidea taxus</i> and <i>Purshia tridentata / Hesperostipa comata</i> . Roads form pre-existing fuel breaks on three of four sides, with private property adjacent to the southeast.	
Fairv	11.0	0.0	0.0	10.9	0.1	The Fairv FTU is east of Knippleberg Road and has equivalent species at risk overlaps to the Golf FTU, and is within the South Okanagan Wildlife Management Area. Private property borders the FTU to the north, east, and south which increases the complexity of implementation.	

³² Wildfire behaviour threat was only calculated for the portion of the Oliver PTU that falls within the AOI of this CWRP.



Map 9: Overview map of three Fuel Treatment Units identified for prescribed burning.

SECTION 6: FIRESMART ROADMAP AND CWRP ACTION PLAN

6.1 FIRESMART ROADMAP

The FireSmart Roadmap (see Appendix G: FireSmart Roadmap) is a concept that visually demonstrates how no two communities will follow the same path towards increased community wildfire resiliency, but that actions progress along four sequential phases. Various FireSmart activities may appear in multiple phases, but should reflect progression in terms of the community's understanding and adoption of FireSmart principles.³³

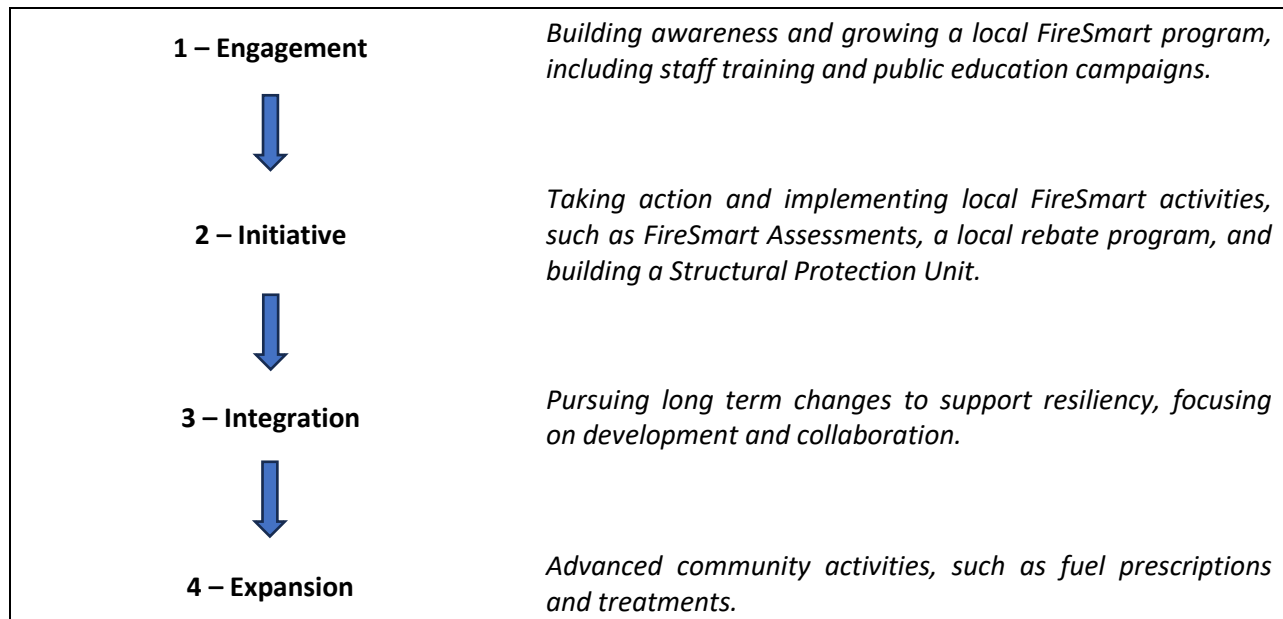


Figure 14. Graphic representation of the FireSmart Roadmap concept.

Prior to the first phase, FireSmart BC recommends that three foundational elements are in place, and the CRI program requires these to stay in place prior to future funding applications:

- A FireSmart Coordinator;
- A Community Wildfire Resiliency Plan;
- A Community FireSmart Resiliency Committee.

The Town of Oliver currently has all three of these elements in place and is progressing through the engagement and initiative phases of the Roadmap. Recommendations in this CWRP will allow Oliver to expand upon previous initiatives while pursuing activities through the Integration and Expansion phases. Examples of activities completed and ongoing under each phase, paired with comments and suggested next steps (included in the CWRP Action Plan) include:

³³ Community Resiliency Investment. (2023). *FireSmart Community Funding and Supports Supplemental Instruction Guide*. Retrieved from: <https://www.ubcm.ca/funding-programs/local-government-program-services/community-resiliency-investment/firesmart-0>

Table 16. Summary of the Town of Oliver's progress along the FireSmart Roadmap.

FireSmart Roadmap Stage	Current Status	Recommended Next Steps
1 – Engagement	FireSmart Coordinator trained as an LFR / WMS and attended the FireSmart Conference / WUI Symposium. Oliver FireSmart is actively delivering FireSmart education programming through print resources and in-person events.	Continue efforts and focus on interface and intermix neighborhoods, leveraging existing community groups if possible.
2 – Initiative	No FireSmart recognized neighbourhoods at the time of writing nor a HIZ / CIIZ program or rebate program established. SPU complete (1) and one partial being completed.	Removal of barriers for FireSmart landscaping – examples include: a chipper or bin program, or clean-up day.
3 – Integration	Official Community Plan includes recognition of wildfire risk and potential wildfire DPA, but no requirements are in place.	Consider a Wildfire Hazard DPA and/or FireSmart landscaping bylaws. Move FireSmart further into the community through the FireSmart BC Plant Program and Library program.
4 – Expansion	FireSmart Coordinator trained to deliver Farm and Ranch Wildfire Preparedness workshop.	Obtain funding to prescribe and treat recommended fuel treatment (prescribed burn) units – or complete through the CLWRR program.

Table 1 in the Executive Summary details the Action Plan for the Town of Oliver. Each Action Item is a prioritized recommendation supported with a rationale, suggested lead agency, expected timeframe, resources required (funding, staff capacity), and metric for success. The corresponding Roadmap phase is also noted.

6.2 TRACKING, REPORTING, AND UPDATES

Appendix A: Review of 2016 Oliver CWPP summarizes recommendations from the 2016 CWPP and their current status. This review was used to inform the 2024 Action Plan.

As the Town of Oliver works towards implementation of this CWRP, the FireSmart Coordinator should consider scheduling an annual review of progress made towards each action item/recommendation. Tracking and reporting will create accountability and also help with future funding applications. A brief annual report can be shared with the public to highlight accomplishments and successes of the FireSmart program (for example, number of members trained, number of assessments completed), which will serve to further FireSmart engagement.

The Town of Oliver should prepare for a five-year comprehensive review/update of the entire plan. A current CWRP (typically 5 years or less) is presently a requirement of the FCFS program. An update should review the entire plan and consider how risk has changed based on any recent wildfires, vegetation management works completed, significant changes to the built environment due to growth and development, economic changes, or other factors that would influence the overall success of the plan. This would also include a detailed analysis of all completed fuel management treatments within the planning area with an updated status and/or a maintenance plan.

The Town of Oliver has been provided with this 2024 CWRP Action Plan as an Excel spreadsheet. This will allow for easy updating and tracking, with new columns and rows added as necessary. This spreadsheet can form the basis for the next CWRP update and assist Oliver in reporting on progress to elected officials and the public, as well as for grant applications.

SECTION 7: APPENDICES

7.1 APPENDIX A: REVIEW OF 2016 OLIVER CWPP

The scope of the Town of Oliver’s 2016 Community Wildfire Protection Plan (CWPP – prepared by Valhalla Consulting) was a 2-kilometer buffer from the municipal boundaries. The risk assessment for this CWPP involved modelling of potential fire behaviour, inclusion of theoretic ignition risk, an assessment of values at risk, and the identification of suppression constraints. Recommendations from the 2016 CWPP will be summarized below, and comments are provided on the status of these recommendations.

7.1.1 RECOMMENDATIONS

Successful **Inadequate/In-Progress/Unrealistic**

Item	Recommendation	Status & Comments
1	Promote wildfire risk reduced development using Wildfire Development Permit Area and bylaws, covenants or other governing policies	No Wildfire DPA has been enacted by the Town of Oliver. FireSmart construction and landscaping practices are not currently promoted or required by the Town.
2	Engage in public awareness of the wildfire risk throughout the community in the lead up, and during, the fire season.	Social media / public engagement regarding wildfire risk is limited in the Town of Oliver, for both residents and/or visitors. FireSmart public information sessions have begun to be held as of 2023 through Oliver’s FireSmart Coordinator.
3	Consider guidelines that mirror those within the Wildfire Act and Regulations with regards to construction activities within 300 m of natural fuel sources (grass or forest) during Danger Class 4 & 5	No guidelines are in-place to restrict high-risk construction activities within the interface in Oliver, in response to fire danger rating.
4	Ensure the local fire department has the appropriate equipment (transportation, water delivery, etc.) and personal protective gear to undertake interface wildfire suppression	While OFD is continuing to increase their wildland-specific training and equipment allotments, they are currently well prepared for wildfire based on their training, experience, and equipment. See Section 5.5 for specifics.
5	Pursue provincial funding to develop fuel management prescriptions and implement these prescriptions for the interface priority treatment list and proposed landscape level fuel breaks	An interface fuel treatment was identified on OIB lands, portions of which have been re-identified through OIB’s 2023 CWPP. No work done to date. Areas to the south of this unit were treated by OIB in 2023.
6	Work with adjacent government agencies and local licensees to create landscape level fuel breaks to protect the community for an approaching large-scale wildfire on the outskirts of the Town	No work done to date. Portions of the “West Fuel Break” identified in the 2016 CWPP for prescribed burning are included in the fuel treatment units for this CWRP, and/or burned in 2023. The “East Fuel Break” is on OIB #1, and portions burned in 2021. Licensee involvement in forest harvesting is outside the scope of this CWRP.

7	Develop an ongoing community fire management program to reduce the wildfire risk to the community through management of the grassland fuel breaks adjacent to the community.	No active management program currently established. This is recommended through this CWRP, and is being collaborated on between Oliver, the Ministry of Forests, OIB, and the BCWS.
8	Submit applications to the UBCM FireSmart Grant program to continue to work towards safe guarding the community from wildfire risk.	Oliver is currently funding FireSmart positions and work through the CRI program.

7.2 APPENDIX B: REVIEW OF 2023 OSOYOOS INDIAN BAND CWPP

The scope of Osoyoos Indian Band’s 2023 Community Wildfire Protection Plan (CWPP) was the entirety of OIB #1. The local wildfire threat assessment for this CWPP involved a review of fuel types throughout the project area, while incorporating the proximity of fuel to the community, local fire spread patterns, topographical considerations, and local factors. Recommendations from this 2023 CWPP are paraphrased and shown below, with potential synergies with the Town of Oliver listed alongside.

7.2.1 RECOMMENDATIONS

Item	Priority	Recommendation	Status & Comments
Section 1.2: CWPP Planning Process			
		Objective: Establish an annual review process, including: progress on CWPP recommendations, opportunities for improvement, public engagement, and annual funding applications.	
		Synergy: Annual review of Oliver’s progress recommended in Section 6.2, and interagency meetings to discuss progress discussed in Section 5.4.	
		Objective: Plan an intensive and coordinated review of CWPPs with the RDOS when updating the documents (4-6 years), in order to share information and assess updates to funding opportunities, templates, policies, and environmental factors.	
		Synergy: Interagency meetings progress discussed in Section 5.4 through a sub-regional CFRC.	
		Objective: When developing communications regarding wildfire hazard for band members/public, prioritize describing the historical and cultural role that fire has played on the ecosystem.	
		Synergy: Communications regarding wildfire hazard should be regionally unified, and the push for re-introducing prescribed / cultural fire to the South Okanagan is recommended in this CWRP.	
		Objective: Maintain a public webpage on the OIB website with accessible links to the current fire danger class (McCuddy fire weather station).	
		Synergy: A regional communication strategy for fire hazard has been recommended, along with internal improvements for communicating hazard. Local wildfire professionals have recommended the use of the newly installed Chopaka fire weather station to represent valley bottom conditions.	
		Objective: Expand door to door FireSmart assessments with OIB IR in order to educate residents and to assess overall risk to private properties.	
		Synergy: HIZ Assessment program recommended in Oliver.	
		Objective: Make copies of this report with all maps available to band members through the OIB website, social media, and public forums. Create an interactive web mapping tool to allow residents to locate their property and associated wildfire risk.	
		Synergy: Making the Oliver CWRP public with a web mapping tool has been recommended.	
		Objective: Participate in FireSmart events as a community, increasing awareness and knowledge of wildfire preparedness.	
		Synergy: FireSmart community events recommended through this CWRP. Events could be performed collaboratively between OIB and Oliver members.	
		Objective: Managed forest land planning (WL1500, FNWL, TFL, etc.) should prioritize factors contributing to fuel build up (i.e., beetle kill), working with natural disturbance regimes and ecological characteristics of wildland fuels to minimize potentially catastrophic fires. OIB should advocate for potential projects within the WUI as funding permits.	
		Synergy: There are no forest tenures and no established forest harvesting in Oliver’s WUI. Ecosystem and wildfire risk management has been recommended through FTUs that are based on prescribed burning – which can be collaboratively developed between Oliver, OIB, the Ministry of Forests, and the BCWS.	
		Objective: Complete FireSmart Assessments on all First Nation owned critical infrastructure designated for emergency response.	

Synergy: Critical Infrastructure assessments in Oliver have been recommended – some of which also services OIB properties.
Objective: Consider creating a full-time community monitor position, designated to be a watchdog/educator for human caused ignitions.
Synergy: No synergy. Response of OFD deemed sufficient within Oliver.
Objective: Establish Open Burning Regulations and enforcement procedures for all OIB Lands and Tenants.
Synergy: Open burning is heavily restricted within the Town of Oliver and on surrounding agricultural lands. Have recommended sharing FireSmart BC and the BCWS' Open Burning Practices for Farms and Ranches: https://firesmartbc.ca/resource/open-burning-practices-for-farmers-and-ranchers/
Objective: Adopt the use of low intensity prescribed fire as a tool to mitigate risk within appropriate ecosystems within the WUI. Appropriately planned prescribed burns can be a cost effective and ecologically relevant component of overall fuel management.
Synergy: Idea is also being pushed through this CWRP – and specifically recommended in the three FTUs identified.
Objective: Revive the use of historical cultural burning practices.
Synergy: Cultural burning practices to be synergized with “prescribed burning” efforts in all FTUs.
Objective: Maintain past fuel reduction treatments to ensure the intended benefits are still being met.
Synergy: No fuel treatments have been completed in the Oliver WUI, but prescribed / cultural fire is a desirable maintenance tool for previously treated areas. OFD can be involved with these fires to increase training and capacity.
Objective: Consider the use of recommended permanent fuel breaks (outlined within the document).
Synergy: FTUs in this CWRP can function as permanent fuel breaks if they are regularly maintained.
Objective: Work with Fortis to implement regular danger tree removal on I.R. #1 as required.
Synergy: No synergy – Fortis right of ways in Oliver are generally free of trees, though right-of-way maintenance has been recommended.
Objective: Manage for deciduous composition in all harvested areas adjacent to interface zones.
Synergy: No synergy. Harvesting is not an option in the Oliver WUI.
Objective: Provide the FireSmart Canada – FireSmart Guide to Landscaping and FireSmart Begins at Home brochures at the OIB band office.
Synergy: Delivering and providing FireSmart materials in public places has been recommended in this CWRP.
Objective: Increase heat shielding and ground shading to residences by planting deciduous trees and encouraging fire resistant landscaping.
Synergy: Encouraging fire resistant landscaping is being pushed in this CWRP. Oliver parks staff that are involved with xeriscaping projects have pushed for proper xeriscaping that still provides ground shading on properties.
Objective: Work with the MOTI to ensure that egress right-of-ways are managed for fuel accumulations and regularly maintained.
Synergy: Discussing improved right-of-way maintenance with MOTI and Fortis has been recommended in this CWRP.
Objective: Develop a network of permanent water access sites.
Synergy: OFD does not have any concerns with their water availability within Oliver and in surrounding areas, and has pre-identified natural water sources.
Objective: Complete an Emergency Evacuation Plan for IR #1.
Synergy: Oliver does not have an Emergency Evacuation Plan completed, though one has not been recommended through this CWRP due to the complexity of wildfire events.
Objective: Train an OIB Initial Attack (IA) crew to respond to ignitions and be a resource for BCWS on larger fires within the WUI.
Synergy: Training and/or exercises could be coordinated with the OFD.
Objective: OIB should consider purchasing a slip tank unit that can be mounted on existing pickup trucks to use as a Type 6/7 wildland fire engine.
Synergy: Recommendations and training with this equipment could be coordinated with the OFD.

7.3 APPENDIX C: REVIEW OF 2020 RDOS CWPP

The scope of the RDOS’s 2020 Community Wildfire Protection Plan (CWPP) was the entire RDOS. The risk assessment for this CWPP involved a review of fuel types and topography throughout the project area, to inform a provincially standardized wildfire threat assessment process. Recommendations from this 2020 CWPP are paraphrased and shown below, with potential synergies with the Town of Oliver listed alongside.

7.3.1 RECOMMENDATIONS

Item	Priority	Recommendation	Status & Comments
Section 1.2: CWPP Planning Process			
		Objective: Establish an annual review cycle to assess and report CWPP recommendation progress. Establish a major review cycle (4-6 years) to assess plan relevance and usefulness.	
		Synergy: Ensuring the Town of Oliver has an up-to-date CWRP is recommended, and is a requirement for future funding through the CRI program. Ensuring that future updates to Oliver and RDOS CWRPs are collaborative will be key in achieving landscape resilience.	
		Objective: Improved fire weather information (re-establishing Chain Lake / Stemwinder stations)	
		Synergy: Chopaka weather station installed in 2024. Need for this station discussed in Section 4.1.2.	
		Objective: Establish a Wildfire DPA for the entire RDOS (RDOS put out an RFP for a DPA to be developed for EA A in 2020)	
		Synergy: See Section 5.3 regarding Wildfire DPAs and the ongoing process in the RDOS.	
		Objective: Over a 3–5-year period, apply for funding to prescribe and treat 32.4 ha of municipal ownership class lands summarized in Table 13	
		Synergy: None of these treatment areas fall within Electoral Area A or C.	
		Objective: Through the South Okanagan Similkameen Wildfire Prevention Working Group, support FLNRORD to develop FMPs and undertake WRR treatments on 2,874 ha of CL. Same is repeated for 20.5 ha of provincial park / protected areas.	
		Synergy: No map or spatial data of these proposed treatment areas was able to be obtained at the time of writing, though none are adjacent to Oliver.	
		Objective: Ensure that the current CWPP and deliverable are accessible and share with the public, FN, adjacent local governments, industry, and relevant NGOs.	
		Synergy: Equivalent recommendation made in this CWRP.	
		Objective: Develop a regional district wildfire risk reduction communications plan	
		Synergy: Synthesizing wildfire risk reduction and FireSmart communications at the regional level has been proposed in this CWRP.	
		Objective: Conduct FireSmart Community Recognition Projects	
		Synergy: Establishing the FireSmart Neighbourhood Recognition Program has been recommended in this CWRP.	
		Objective: Acquire an enclosed trailer branded with RDOS FireSmart graphics and stocked with public education tools, as well as hand tools and basic PPE to facilitate FireSmart events, including neighbourhood brush cleanup. Trailer should be paired with a rental chipper and/or disposal bins to facilitate debris disposal.	
		Synergy: Establishing / continuing FireSmart education and vegetation management programs has been recommended in this CWRP.	
		Objective: Support fire use and prescribed fire in the region	
		Synergy: Prescribed fire has been recommended as the main fuel management tool on Crown land and OIB land adjacent to Oliver.	

Objective: Establish a working relationship between RDOS and MOTI to address wildland fuel hazard concerns along Provincial highways in the RDOS.
Synergy: Advocating for improved right-of-way maintenance with MOTI and Fortis has been recommended in this CWRP.
Objective: Undertake evacuation route planning that includes the identification of single access/egress routes to populated areas in relation to wildfire threat.
Synergy: Evacuation concerns from single access/egress areas in Oliver is not currently a concern of the OFD.
Objective: Pursue enhanced cross-training with BCWS
Synergy: Recommended for OFD to continue and enhance their cross-training efforts with the BCWS – for both wildfire suppression and structural protection.
Objective: Increase the SPU capabilities within the RDOS to include 2-3 strategically located Type 2 SPUs
Synergy: Increasing the allotment of SPU gear is an ongoing process for the OFD, and will have two full SPUs within four years.

7.4 APPENDIX D: LOCAL WILDFIRE RISK PROCESS

Field Data Collection

The primary goals of field data collection are to confirm or correct the provincial fuel type, complete WUI Threat Assessment Plots (if applicable), and assess other features of interest to the development of the CWRP. This is accomplished by traversing as much of the AOI as possible (within time, budget, and access constraints). Threat Assessment plots, as per the 2020 form and the Wildland Urban Interface Threat Assessment Guide, were not completed for this CWRP, as the threat rating system is tailored for forested stands and does not accurately assign threat to grass / shrub-steppe ecosystems. Fire threat for the ecosystems and fuel structures surrounding Oliver was assessed and corroborated with local experts (OFD, BC Wildfire Service) and provincial researchers (Natural Resources Canada).

For clarity, the final threat ratings for the AOI were determined through the completion of the following methodological steps:

1. Update fuel-typing using field verification and using publicly available orthophotography.
2. Update structural data using address point information provided by the client, field visits to confirm structure additions or deletions, and orthophotography.
3. Complete field work to ground-truth fuel typing and assess site-level threat ratings.
4. Threat analysis using collected field data.

7.4.1 APPENDIX D-1: FUEL TYPING METHODOLOGY AND LIMITATIONS

The Canadian Forest Fire Behaviour Prediction (FBP) System outlines five major fuel groups and sixteen fuel types based on characteristic fire behaviour under defined conditions.³⁴ Although a subjective process, the most appropriate fuel type was assigned based on research, experience, and practical knowledge; this system has been used within BC, with continual improvement and refinement, for 20 years.³⁵ It should be noted that there are significant limitations with the fuel typing system which should be recognized.

Significant limitations include a fuel typing system designed to describe fuels that sometimes do not occur within the WUI, fuel types which cannot accurately capture the natural variability within a polygon, and limitations in the data used to create initial fuel types.³⁵ There are several implications of the aforementioned limitations, which include: fuel typing further from the developed areas of the study has lower confidence, generally; and fuel typing should be used as a starting point for more detailed assessments and as an indicator of overall wildfire risk, not as an operational, or site-level, assessment.

³⁴ Forestry Canada Fire Danger Group. 1992. Development and Structure of the Canadian Forest Fire Behavior Prediction System: Information Report ST-X-3.

³⁵ Perrakis, D.B., Eade G., and Hicks, D. 2018. Natural Resources Canada. Canadian Forest Service. *British Columbia Wildfire Fuel Typing and Fuel Type Layer Description* 2018 Version.

Natural ecosystems are dynamic and change over time: fuels accumulate, areas fill in with conifer regeneration, and forest health outbreaks occur. Regular monitoring of fuel types and wildfire risk assessment should occur every 5 – 10 years to determine the need for threat assessment updates and the timing for their implementation.

During field visits, recurring patterns of fuel type errors were found in the provincial dataset. They were:

- Non-fuel being typed as O-1a/b, D-1/2, or C-7.
- Areas of O-1a/b or D-1/2 being typed as non-fuel.
- Areas of O-1a/b being typed as C-7.

The resulting updated fuel types were shown previously on Map 4.

7.4.2 APPENDIX D-2: WILDFIRE THREAT ASSESSMENT PLOTS

No site-level Wildfire Threat Assessment (WTA) plots were completed during the field work for this CWRP. The wildfire threat in the ecosystems and fuel types surrounding Oliver is not accurately captured through the WTA process, as the majority of scoring on WTA forms is in response to the distribution of ladder fuels and conifer trees. To demonstrate this a WTA form was completed on the desktop to capture the most hazardous fuel type surrounding Oliver – O-1a/b with a decadent shrub component and a scattering of conifer trees – shown below in Figure 15. This fuel hazard would score a very low “Moderate” as per the provincial threat assessment process (51 total points), with the following point ranges assigned to the Southern Interior:

- Wildfire Threat Score:
 - Low (0-47); Moderate (48 – 65); High (66 – 79); Extreme (>80)

Wildfire Threat Assessment Worksheet - Fuel Assessment (Site Level)		Plot #
Location	Town of Oliver	OLIVER CWRP
Date	4/11/24	Assessor/ Professional Designation
Coordinates (Lat/Long - Degrees/Decimal Minutes)	N 49° 10' 46.9" W 119° 34' 94.7"	RPF
Crown Species Composition (species %)	Pv100(F)	
Ladder Fuel Species Composition (species %)	Sagebrush / Antelope Brush	
Component/ Sub Component	Levels/ Classes	
Forest Floor and Organic Layer		
1	Depth of Organic layer (cm)	1-2 (1), 2-5 (3), 5-10 (5), 10-20 (3), >20 (2)
Surface and Ladder Fuel (0.1 - 3.0 meters in height)		
2	Surface fuel composition	Moss, Herbs and Deciduous Shrubs (4), Lichen, Conifer Shrubs (6), Dead fines (Leaves, Needles or fine branch material) fuel (<1cm) (8), Pinegrass (10), Sagebrush, Bunchgrass, Juniper, Scotch broom (15)
3	Dead and Down material Continuity (<7cm)	Absent (0), Scattered <10 coverage (4), 10-25% coverage (8), 26-50% coverage (10), >50% Coverage (15)
4	Ladder fuel composition	Deciduous (0), Mixedwood (5), Other conifer (8), Elevated dead fuel (10), Spruce/ Fir/ Pine (15)
5	Ladder fuel horizontal continuity	Absent (0), Sparse <10% coverage (2), 10-30% coverage (8), 40-60% coverage (10), >60% coverage (15)
6	Stem/ha (understorey) ¹	<500 (2), 501-200 (4), 801-1200 (6), 1201-1500 (8), >1500 (10)
Stand Structure and Composition (Dominant and Co-Dominate stems)		
7	Overstorey Composition/ CBH (Crown Base Height)	Deciduous (< 25% conifer) (0), Mixedwood (25% Conifer) (2), Conifer with high CBH (>10m) (3), Conifer with moderate CBH (5-9m) (4), Conifer with low CBH (<4m) (5)
8	Crown Closure	< 20% (0), 20-40% (2), 41-60% (4), 61-80% (5), >80% (4)
9	Fuel Strata Gap ² (m)	> 10 (0), 5-9 (1), 3-5 (3), < 3 (5)
10	Stems/ha live/ grn dom (overstorey)	<400 (0), 401-600 (2), 601-900 (3), 901-1200 (4), >1200 (5)
11	Dead and Dying (% of dominant and co-dominant stems)	Standing Dead/ Partial down <20% (2), Standing Dead/ Partial down 21-50% (5), Standing Dead/ Partial down 51-75% (8), Standing Dead/ Partial down >75% (10)
Ecoprovince		Southern Interior (0/48/66/80)
Threat Assessment		Moderate
WTA Total		51
<p>Comments:</p> <p>Scoring is representative of sagebrush / antelope-brush dominant shrub-steppe ecosystems on Oliver Mountain, to the southwest of the Town of Oliver. There is largely only a surface fire hazard in these areas, though the potential fire intensity is extreme.</p> <p>On site ladder fuels are represented by large (up to 3m in height) decadent shrubs, with a VERY low coverage of mature conifer trees. Conifers that have not been exposed to a recent disturbance have low crown base heights. The ladder fuel scoring on this form is inaccurate and overly assigns threat to this layer. Crown fuel scoring is also not representative as there is not an "adequate" cover of trees to assign scoring to this layer, but it is shown here as an example.</p> <p>Adjacent areas that have naturally burned in recent years (2015/2023) have a much lower hazard.</p>		
<p>¹ Understorey is considered ladder and suppressed stems in this category (distinct break between these stems and overstorey)</p> <p>² Fuel Strata Gap - Distance from top of ladder fuel to live crown base height of overstorey</p>		

PROJECT: Town of Oliver CWRP - 2024

British Columbia Wildfire Service - Photo Guide

SITE INFORMATION Date: 4/11/24 Plot #: OLIVER CWRP General Location: Town of Oliver

Sampled: 4/11/24 Coordinates: N 49° 10' 46.9" W 119° 34' 94.7"

FBP Fuel Type: O-1b

Slope (%): Variable, majority < 30

Aspect (deg.): Variable, S / SE

Elevation (m): 400

Canopy Closure (%): N/A

Average Forest Floor Depth (cm): 1-2

SURFACE FUELS:

Photo comment: Decadent shrubs, high continuity, with bunchgrass and exposed mineral soil between. Other (sp)

LADDER FUELS:

Photo Comment: Low drooping conifer trees (Py) and dense decadent sagebrush and antelope brush. Other (spec)

CROWN FUELS:

Photo Comment: No photo shown. Low density conifers. Other (sp)

Figure 15: Example Wildfire Threat Assessment Plot from a characteristic high-hazard shrub-steppe ecosystem surrounding Oliver.

7.4.3 APPENDIX D-3: WILDFIRE THREAT SPATIAL ANALYSIS METHODOLOGY

As part of the CWRP process, spatial data submissions are required to meet the defined standards in the Program and Application Guide. Proponents completing a CWRP can obtain open-source BC Wildfire datasets, including Provincial Strategic Threat Analysis (PSTA) datasets from the British Columbia Data Catalogue. Wildfire spatial datasets obtained through the BC Open Data Catalogue used in the development of the CWRP include, but are not limited to:

- PSTA Spotting Impact
- PSTA Fire Density
- PSTA Fire Threat Rating
- PSTA Lighting Fire Density
- PSTA Human Fire Density
- Head Fire Intensity
- BC Wildfire Wildland Urban Interface Risk Class
- BC Wildfire WUI Human Interface Buffer
- BC Wildfire WUI 1km Buffer
- Current Fire Polygons
- Current Fire Locations
- Historical Fire Perimeters
- Historical Fire Incident Locations
- Historical Fire Burn Severity
- BC Wildfire Fuel Types

As part of the program, proponents completing a CWRP are provided with a supplementary PSTA dataset from BC Wildfire Services. This dataset includes:

- Structures
- Structure Density

The required components for the spatial data submission are detailed in the Program and Application Guide Spatial Appendix – these include:

- AOI and Values at Risk
- Local Fire Risk
- Proposed Fuel Treatment Units

The provided PSTA data does not transfer directly into the geodatabase for submission, and several PSTA feature classes require extensive updating or correction. In addition, the Fire Threat determined in the PSTA is fundamentally different than the localized Fire Threat feature class that is included in the Local Fire Risk map required for project submission. The Fire Threat in the PSTA is based on provincial scale inputs - fire density; spotting impact; and head fire intensity, while the spatial submission Fire Threat is based on the components of the Wildland Urban Interface Threat Assessment Worksheet.

Spatial Analysis

The field data is used to correct the fuel type polygon attributes provided in the PSTA. This corrected fuel type layer is then used as part of the spatial analysis process. The other components are developed using spatial data (BEC zone, fire history zone) or spatial analysis (aspect, slope). A scoring system was developed to categorize resultant polygons as having relatively low, moderate, high or extreme Fire Threat, or Low, Moderate, High or Extreme WUI Threat. Table 17 below summarizes the components and scores to determine the Fire Behaviour Threat.

Table 17: Components of Fire Threat Analysis

Attribute	Indicator	Score
Fuel Type ³⁶	C-1	35
	C-2	
	C-3	
	C-4	
	M-3/4, >50% dead fir	25
	C-6	
	M-1/2, >75% conifer	20
	C-7	
	M-3/4, <50% dead fir	
	O-1a/b (3) – Decadent Shrub Load	
	M-1/2, 50-75% conifer	15
	O-1a/b (2) – Advanced Shrub Load	
	M-1/2, 25-50% conifer	10
	C-5	
	O-1a/b	
	S-1	
	S-2	
	S-3	
	M-1/2, <25% conifer	5
	D-1/2	0
W	0	
N	0	
Weather - BEC Zone	AT, irrigated	1
	CWH, MH	3
	ICH, SBS, ESSF	7
	IDF, MS, SBPS, CWHds1 & ds2, BWBS, SWB, CDF, CWHxm1	10
	PP, BG	15

³⁶ Traditionally, O-1a/b is shown as a single fuel type and given a score of “10” points. After consulting with fire behaviour experts from Natural Resources Canada and understanding the different fire behaviour potential between different structures of grassland / shrubland based on ground fuel loading, three tiers of scoring for O-1a/b were assigned based on ground-truthing and/or interpretation of aerial imagery.

Attribute	Indicator	Score
Historical Fire Occurrence Zone	G5, R1, R2, G6, V5, R9, V9, V3, R5, R8, V7	1
	G3, G8, R3, R4, V6, G1, G9, V8	5
	G7, C5, G4, C4, V1, C1, N6	8
	K1, K5, K3, C2, C3, N5, K6, N4, K7, N2	10
	N7, K4	15
Slope	<16	1
	16-29 (max N slopes)	5
	30-44	10
	45-54	12
	>55	15
Aspect (>15% slope)	North	0
	East	5
	<16% slope, all aspect	10
	West	12
	South	15

WUI Risk Classes and their associated summed scores:

Very Low	0
Low	0-35
Moderate	35-55
High	55-65
Extreme	>65

As discussed in Section 4.4.2, a WUI Risk Class analysis is only completed for areas with a ‘High’ or ‘Extreme’ Wildfire Threat Class. Through a Risk Class analysis, the above attributes are summed to produce polygons with a final WUI Risk Score. To determine the Fire Threat score, only the distance to structures is used, based on buffer distance classes of <200m, 200m-500m and >500m. Polygons within 200m are rated as ‘extreme’, within 500m are rated as ‘high’, within 2km are ‘moderate’, and distances over that are rated ‘low’.

There are obvious limitations in this method, most notably that not all components of the threat assessment worksheet are scalable to a GIS model, generalizing the Fire Behaviour Threat score. The WUI Threat Score is greatly simplified, as determining the position of structures on a slope, the type of development and the relative position are difficult in an automated GIS process. Structures are considered, but there is no consideration for structure type (also not included on threat assessment worksheet). This method uses the best available information to produce accurate and useable threat assessment across the study area in a format which is required by the UBCM CRI program.

7.4.4 APPENDIX D-4: FIRE SPREAD PATTERNS

Figure 16 below displays the daily average ISI values for the McCuddy and Penticton RS weather stations, which roughly represents wind speed and predominant direction for the South Okanagan. The majority of ISI measurements are from the west / northwest, though the direction of the highest ISI values are inconsistent and likely associated with erratic cold fronts or storm events. Local BC Wildfire Service staff have noted that the majority of aggressive fires in the fuel types and topography surrounding Oliver are wind-driven with very fast moving and dynamic fire behaviour. BC Wildfire staff have also commented that in this region of the Okanagan valley the predominant wind direction is from the north or west, which aligns with the two ISI roses below.

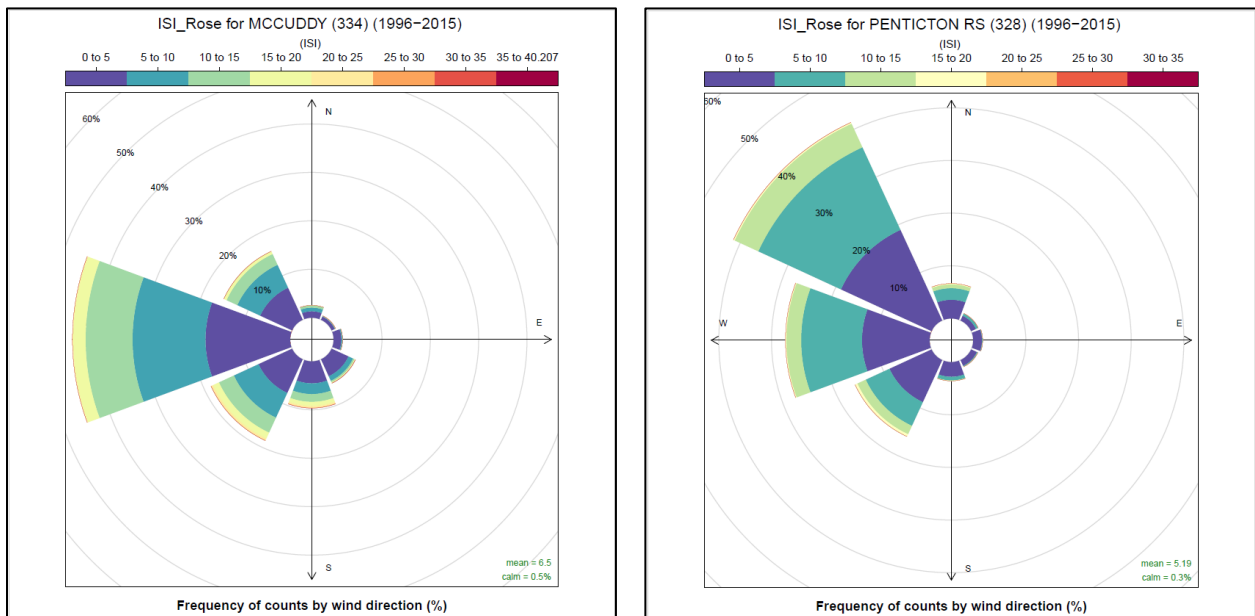


Figure 16: Initial Spread Index (ISI) roses depicting average daily wind speed and direction for each month during the fire season (April – October). Data taken from the McCuddy and Penticton RS weather stations (1996-2015).

7.4.5 APPENDIX D-5: PROXIMITY OF FUEL TO THE COMMUNITY

Home and Critical Infrastructure Ignition Zones

Multiple studies have shown that the principal factors regarding home and structure loss to wildfire are the structure's characteristics and immediate surroundings. The area that determines the ignition potential of a structure to wildfire is referred to as (for residences) the Home Ignition Zone (HIZ) or (for critical infrastructure) the Critical Infrastructure Ignition Zone (CIIZ).^{37,38} Both the HIZ and CIIZ include the structure itself and three concentric, progressively wider areas (the Immediate, Intermediate, and Extended Zones) that extend out to 30 m from the structure (Figure 17 below). Up until 2023, the HIZ included an additional area that extended out to 100 m from the structure, but this zone was removed as radiant heat is unlikely to ignite a structure at 30 m and beyond. More details on priority zones can be found in the FireSmart Begins at Home Guide.³⁹

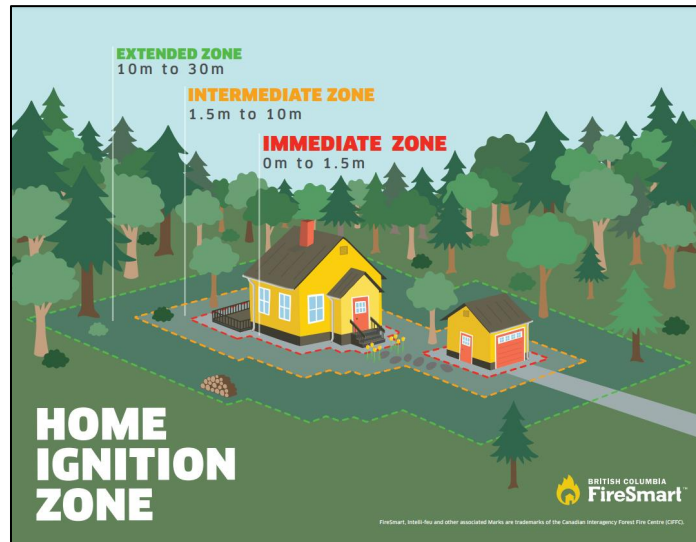


Figure 17: FireSmart Home and Critical Infrastructure Ignition Zone (HIZ, CIIZ)

Because ignitability of the HIZ/CIIZ is the main factor driving structure loss, the intensity and rate of spread of wildland fires beyond the community have not been found to necessarily correspond to loss potential. Increasing ignition resistance would reduce the number of homes simultaneously on fire; extreme wildfire conditions do not necessarily result in WUI fire disasters.⁴⁰ It is for this reason that the key to reducing WUI fire structure loss is to reduce structure ignitability. Mitigation responsibility must be centered on the residents. Risk communication, education on the range of available activities, and prioritization of activities should help homeowners to feel empowered to complete simple risk reduction activities on their property.

³⁷ Reinhardt, E., R. Keane, D. Calkin, J. Cohen. 2008. Objectives and considerations for wildland fuel treatment in forested ecosystems of the interior western United States. *Forest Ecology and Management* 256:1997 - 2006.

³⁸ Cohen, J. Preventing Disaster Home Ignitability in the Wildland-urban Interface. *Journal of Forestry*. p 15 - 21.

³⁹ <https://firesmartcanada.ca/> and <https://begins-at-home-guide.firesmartbc.ca/>

⁴⁰ Calkin, D., J. Cohen, M. Finney, M. Thompson. 2014. *How risk management can prevent future wildfire disasters in the wildland-urban interface*. *Proc Natl Acad Sci U.S.A.* Jan 14; 111(2): 746-751. Accessed online 1 June, 2016 at <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3896199/>.

Community Zone

Vegetation management in the Community Zone encompasses the majority of land in the Town of Oliver, typically between 30 and 100 metres from any homes and structures. Depending on the results of FireSmart Home Ignition Zone assessments on individual structures, vegetation management may be required beyond 30 metres and up to 100 metres on larger parcels.⁴¹ Many Community Zone open spaces/lands are often associated with high use by citizens thus increasing accidental ignition potential and the wildfire risk to critical infrastructure and homes surrounding them.

Landscape Zone

The Landscape Zone encompasses larger undeveloped natural areas adjacent to the Town of Oliver. Much of the Landscape Zone that is outside municipal boundaries is developed or has been converted to agricultural land, with natural shrubland areas to the west and throughout OIB #1. Fuel mitigation in these areas will need to be coordinated with the appropriate land manager (which may be the Ministry of Forests, OIB, or RDOS). When considering risk in the Landscape Zone, Table 18 displays how wildfire threat and mitigation work can be viewed in relation to values within the Town of Oliver.

Table 18: Proximity to the Interface

Proximity to the Interface	Descriptor*	Explanation
WUI 100 <i>HIZ/CIIZ and Community Zones</i>	(0-100 m)	This Zone is always located adjacent to the value at risk. Treatment would modify the wildfire behaviour near or adjacent to the value. Treatment effectiveness would be increased when the value itself is FireSmart.
WUI 500 <i>Community and Landscape Zones</i>	(100-500m)	Treatment would affect wildfire behaviour approaching a value, as well as the wildfire's ability to impact the value with short- to medium-range spotting; should also provide suppression opportunities near a value.
WUI 1000 <i>Landscape Zone</i>	(500-1000 m)	Treatment would be effective in limiting long-range spotting but short-range spotting may fall short of the value and cause a new ignition that could affect a value.
<i>Landscape Zone</i>	>1000 m	This should form part of a landscape assessment and is generally not part of the zoning process. Treatment is relatively ineffective for threat mitigation to a value unless used to form a part of a larger fuel break/treatment.

*Distances are based on spotting distances of high and moderate fuel type spotting potential and threshold to break Crown fire potential (100m). These distances can be varied with appropriate rationale, to address areas with low or extreme fuel hazards.

⁴¹ CRI FCSF 2021 Supplemental Instruction Guide

7.5 APPENDIX E: WILDFIRE RISK ASSESSMENT – WORKSHEETS AND PHOTOS

Provided separately as PDF package.

7.6 APPENDIX F: MAPS

Provided separately as PDF package.

7.7 APPENDIX G: FIRESMART ROADMAP

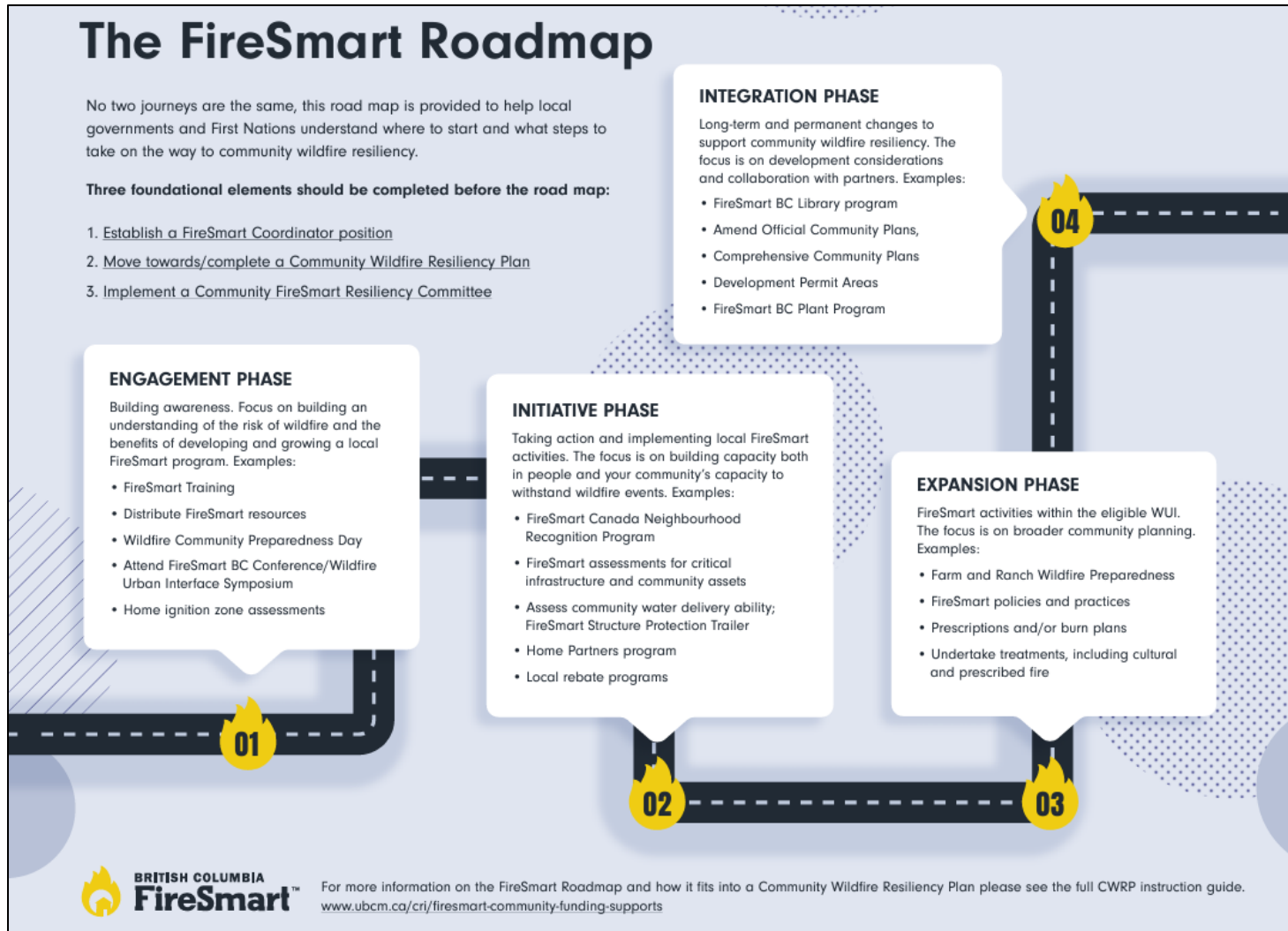


Figure 18: The 'FireSmart Roadmap' is a new focus of community wildfire planning in BC. Recommendations in this CWRP are listed by Roadmap phase.

7.8 APPENDIX H: KEY PROVINCIAL AND FEDERAL ACTS AND REGULATIONS

7.8.1 LINKAGES TO HIGHER LEVEL PLANS AND LEGISLATION

Table 19 below lists a subset of higher-level plans and legislation that will need to be considered when planning and implementing vegetation management activities outside of the municipal boundaries of Oliver.

Table 19: Higher Level Plans and Relevant Legislation

Plan/Legislation	Description and Relationship to CWRP
Okanagan-Shuswap Land and Resource Management Plan - 2001	<p>The LRMP provides direction for the management of Crown Land and resources within the South Okanagan. Various resource management zones (RMZs) have been identified within the AOI for this CWRP.</p> <ul style="list-style-type: none"> • <i>Recreation RMZ on Oliver Mountain, overlapping with prescribed burning FTUs. Collaboration will need to occur.</i> • <i>Natural Disturbance Type 4 RMZ throughout the AOI, as discussed in Section 4.2</i> • <i>Community Crown Interface RMZ overlaps the majority of the AOI, highlighting the need for collaboration through growth and land management activities.</i> • <i>Multiple other legal and non-legal RMZs overlap the AOI and will need to be addressed when vegetation management activities are proposed on surrounding Crown Land.</i>
BC Provincial Open Burning Smoke Control Regulation (OBSCR) - 2019	<p>The OBSCR governs open burning on provincial lands for land clearing, forestry operations and silviculture, wildlife habitat enhancement, and community wildfire risk reduction. The OBSCR does not apply to Resource Management Open Fires (i.e., prescribed / cultural burns).</p> <ul style="list-style-type: none"> • <i>Proposed for portions of Oliver's Fire Protection Bylaw No. 1369 related to open burning to at a minimum adhere to the provincial restrictions on Open Burning.</i> • <i>The Town of Oliver and surrounding areas are located in a High Smoke Sensitivity Zone.</i> • <i>Provides eased setbacks and requirements for open burning that is strictly related to an approved plan for community wildfire risk reduction (Division 2), or when utilizing an air-curtain incinerator (Division 5).</i>