

MINISTRY OF FORESTS: POST-WILDFIRE NATURAL HAZARD RISK ANALYSIS – RECONNAISSANCE REPORT

NOTE: The results given on this form are reconnaissance in nature and are intended to be a warning of potential hazards and risks. It is not a detailed risk analysis and further work may alter the conclusions. Please read the appendix of this report for important limitations. Contact the author for more information.

FIRE NUMBER: N70969 Briggs Creek	FIRE YEAR: 2022	DATE OF REPORT: September 29, 2022	
AUTHOR: Sarah Crookshanks, P.Geo., Ministry of Forests			
REPORT PREPARED FOR: Southeast Fire Centre, District Manager			
FIRE SIZE, LOCATION, AND LAND OWNERSHIP: 2160 ha. Fire is located west of Kaslo on Crown land.			
VALUES AT RISK: Private property land improvements, secondary road, municipal water supply, domestic water supply			
WATERSHEDS AFFECTED	TOTAL AREA	AREA BURNED	BURN SEVERITY (% of watershed area)
Kemp Creek	1270 ha	11 ha (1%)	0.05 % H, 0.5% M
Keen Creek	20344 ha	1442 ha (7%)	3% H, 3% M
NE Unnamed Creek	282 ha	76 ha (27%)	3% H, 12% M
SUMMARY OF POST-FIRE HAZARD AND RISK			
1. Hazard = P(H), the probability of occurrence of a hazardous event 2. Probability of spatial impact, P(S:H), the probability of a hazard reaching or affecting an element at risk 3. Partial Risk, the probability of a hazard occurring and affecting an element at risk = P(H) x P(S:H) 4: Location with the highest risk rating given; at other locations the risk may be lower			
Keen Creek –flood impacting private property land improvements or Kaslo Creek South Fork Road Hazard P(H)¹ = low Probability of spatial impact P(S:H)² = moderate Partial Risk^{3,4} = low The steep tributaries that burned in the Keen Creek watershed are susceptible to debris flows and debris floods. However, the Keen Creek channel gradient (3-6%) is not steep enough to transport these events to the fan. A debris flow in one of these steep tributaries would most likely be diluted by the main flow in Keen Creek, and result in turbid water at the mouth of Keen Creek. Furthermore, because only 7% of the watershed burned, the incremental flood risk on Keen Creek is low. Elements at risk on the Keen Creek fan include land improvements on private property and a secondary road.			
Keen Creek - water quality impacts to surface domestic water users Hazard P(H)¹ = moderate Probability of spatial impact P(S:H)² = high Partial Risk^{3,4} = high It is possible that domestic water users on Keen Creek will experience water quality impacts due to increased sediment load in Keen Creek. Sedimentation is expected to be episodic, occurring during spring freshet and after significant rainstorms.			
Kemp Creek – debris flood impacting Village of Kaslo Water Supply Negligible incremental hazard The fire burned only a very small portion (<1%) of the Kemp Creek watershed and the area that it did burn was very rocky (Figures 2 - 4). Therefore, the likelihood of the burned area contributing to the initiation of a debris flow or flood is negligible. Kemp Creek is susceptible to debris floods with no disturbance. Assessing the background debris flood risk is beyond the scope of this report. The likelihood of water quality impacts from the burned area is also negligible.			

FURTHER ACTIONS

Domestic water users on Keen Creek may want to consider additional water quality treatment measures.

COMMENTS

The Briggs Creek fire began on August 1, 2022 and burned forest mostly within the Keen Creek watershed west of Kaslo. An aerial overview of the fire was completed on August 31.

Burn severity mapping was produced for this fire in late September by regional geomatics staff. The burn severity analysis using Sentinel-2 satellite imagery showed some false positive burned areas outside the fire perimeter, likely due to changes in lighting on rock/talus slopes or vegetation changes in cutblocks. The helicopter overview flight photos confirmed that the fire perimeter was generally accurately drawn. Therefore, the burn severity map was clipped to the perimeter extent. The burned area numbers reported above reflect the clipped burn severity extent. The satellite-derived burn severity within the fire perimeter generally corresponds with the visual determination of burn severity from photos.

Further analysis of post-wildfire natural hazards for this fire is not recommended.

SIGNATURE, SEAL, FIRM PRACTICE #

Original signed and sealed.

ATTACHMENTS

See attached map, photos and Appendix

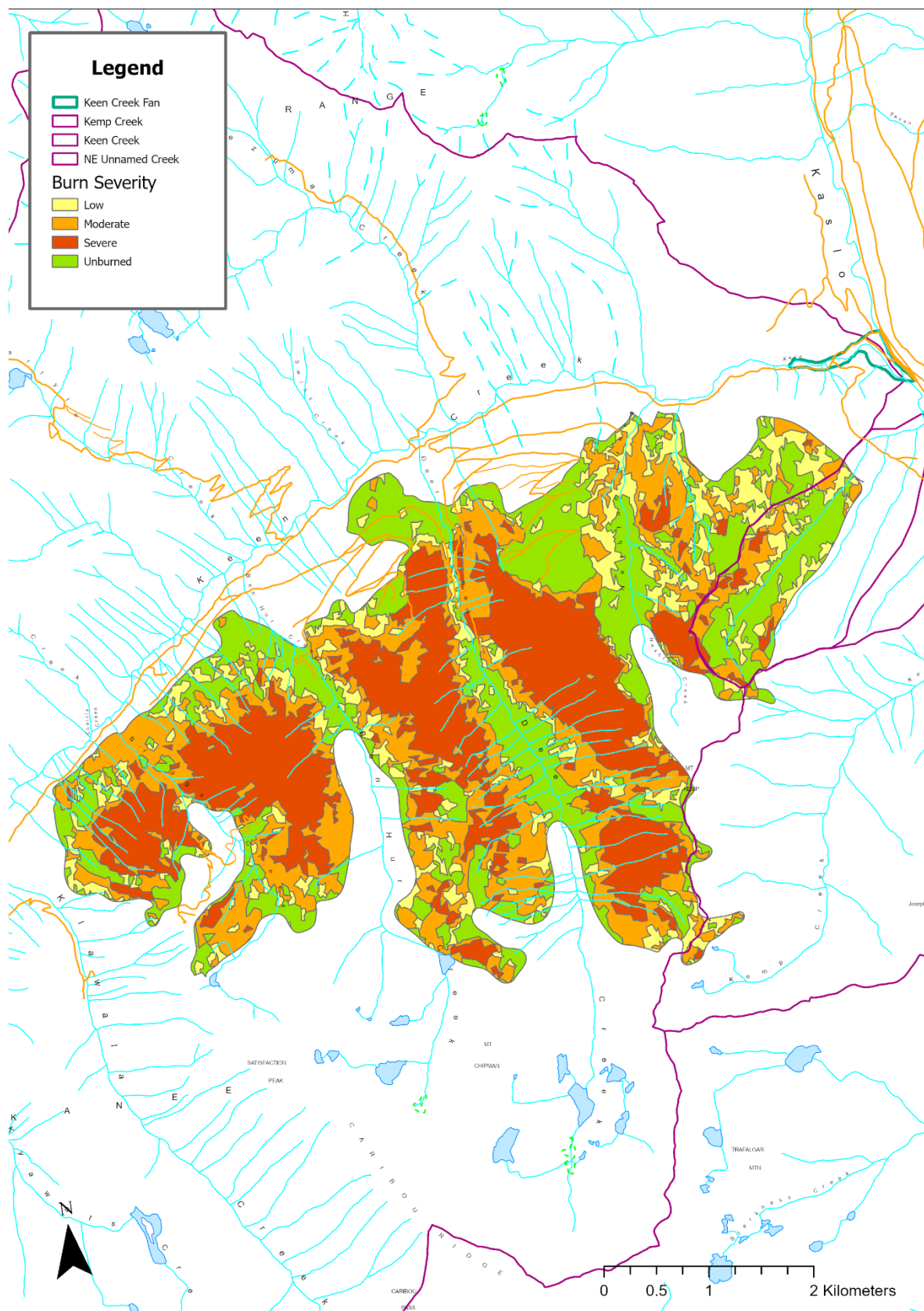


Figure 1 Burn severity map of the Briggs Creek fire showing estimated classes derived using Sentinel-2 imagery (pre-fire: 2021-09-21, post-fire: 2022-09-21).



Figure 2 Kemp Creek watershed



Figure 3 Kemp Creek watershed

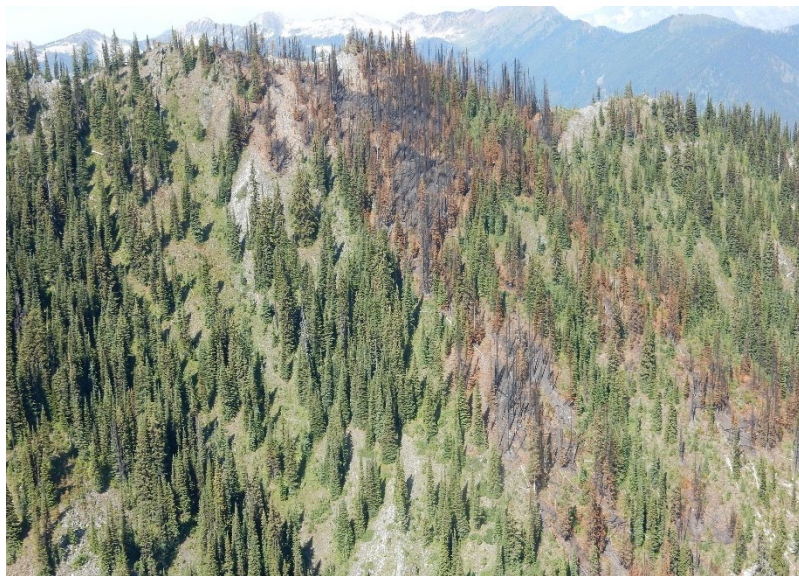


Figure 4 Kemp Creek watershed



Figure 5 High burn severity in Deer Creek watershed



Figure 6 Patchy burn severity in Briggs Creek watershed



Figure 7 Keen Creek at Kaslo Creek South Fork Road

Appendix to PWNHRA Reconnaissance Reports

Scope of reconnaissance reports

Reconnaissance reports are primarily intended to identify whether post-wildfire hazards are likely to occur and need detailed investigation to protect identified elements at risk. Identified elements at risk are generally limited to public safety and infrastructure. Reconnaissance reports may also be used to assess safety conditions for wildfire fighters. In some cases, the MOF District Manager may request assessments for non-standard elements at risk or for other reasons.

Definitions of hazard and risk

Wildfire may produce conditions conducive to a suite of hazards. Debris flows, debris floods, and floods are often the most important hazards, but other types of landslide hazards including rockfall, debris slides and earthflows can also occur in response to wildfire. Wildfire can also cause snow avalanches and may affect water quality, cause erosion and result in sedimentation. Terrain, watershed, and channel conditions that produce post-wildfire hazards may also produce similar hazards in unburned conditions; these hazards may be mentioned, but are not evaluated in this report.

P(H), P(S:H) and partial risk are presented for each identified elements at risk. Multiple types of channel hazards (debris flows, debris floods, floods) may affect an element at risk. These hazards are ranked by severity, with debris flow as the most damaging and destructive and flood as the least damaging and dangerous, and ratings are given for the highest rating hazard that may affect an element at risk. For example, where a channel has the potential for a debris flow and an element at risk may be affected, the lower ranking debris flood and flood hazards are not rated, since discharge and velocity are likely to be less than for a debris flow. These processes may cause erosion or sedimentation that affects the element at risk. Hazards that are unlikely to affect an identified element at risk are not discussed.

Table A1 is a matrix which combines the hazard likelihood with the spatial impact likelihood to determine partial risk.

Table A1. Post-wildfire risk matrix partial risk matrix.

Hazard likelihood (Table A1)	Spatial impact likelihood (Table A2)		
	H	M	L
H	VH	H	M
M	H	M	L
L	M	L	VL

Report Standards

MOF Land Management Handbook 69 is the primary standard followed in this report. LMH 69 describes the process to complete a detailed report. This reconnaissance report uses the framework of LMH 69 but does not follow it where detailed assessment procedures are described.

Land Management Handbook 69 Post Wildfire Natural Hazards Risk Analysis in British Columbia 2015
<https://www.for.gov.bc.ca/hfd/pubs/Docs/Lmh/Lmh69.htm>

Additional guidance is provided in the MOF SOG for PWNHRA and the 2014 MOF Landslide Risk Management Procedure.

Other professional guidance standards that may be used for the preparation of reconnaissance reports are listed below. These guidelines have similar report content to this reconnaissance assessment, but are for different purposes, have different levels of appropriate effort, and do not recognize the potential emergency nature of this reconnaissance assessment. These guidelines include:

EGBC Guidelines for TSA in the Forest Sector 2010
<https://www.egbc.ca/getmedia/684901d7-779e-41dc-8225-05b024beae4f/APEGBC-Guidelines-for-Terrain-Stability-Assessments.pdf.aspx>

EGBC Guidelines for Legislated Landslide Assessments 2010
<https://www.egbc.ca/getmedia/5d8f3362-7ba7-4cf4-a5b6-e8252b2ed76c/APEGBC-Guidelines-for-Legislated-Landslide-Assessments.pdf.aspx>

Legislated Flood Assessments in a Changing Climate in BC 2018
<https://www.egbc.ca/getmedia/f5c2d7e9-26ad-4cb3-b528-940b3aaa9069/Legislated-Flood-Assessments-in-BC.pdf>

Watershed Assessment and management of hydrologic and geomorphic risk in the Forest Sector
<https://www.egbc.ca/app/Practice-Resources/Individual-Practice/Guidelines-Advisories/Document/01525AMW2ATQA5BSODHJAKBAGZDYTRL6FJ/Watershed%20Assessment%20and%20Management%20of%20Hydrologic%20and%20Geomorphic%20Risk%20in%20the%20Forest%20Sect>

Other standards may also apply, depending on the professional qualifications of the writer.