

Sitkum Creek Fire, July-August 2007

Post-Wildfire Risk Analysis

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Post-wildfire erosion and flood hazards: What has happened after other fires?

- Following the 2003 fire season, debris flow or flood events happened in (or below) several burns:
 - Kuskonook
 - Lamb Creek
 - Mt Ingersoll
 - Okanagan Mountain Park
 - Cedar Hills
- Post-wildfire events have only rarely been reported in burns other than 2003.
- After most fires, no significant events happen.
- Weather and soil conditions preceeding the 2007 fires were similar to those in 2003.

Fires change the soil and hydrology conditions in a watershed:

- Loss of the forest canopy – reduced interception, higher snowpack, higher snowmelt rate.
- Loss of moisture storage capacity in the forest floor (litter and duff).
- Combustion of the forest floor can produce a water-repellent (hydrophobic) layer in the soil, which can result in overland flow during rainstorms.
- For all these reasons, increased runoff can occur in streams below a burn, especially from high-intensity rainstorms.
- The effect usually lasts for 3 to 5 years.

Kuskonook Creek debris flow, Aug. 6, 2004:

(this is a steep debris flow dominated fan, unlike Sitkum Creek)









Kuskonook Cr fan in 1994



August 2004

CEDAR HILLS FIRE



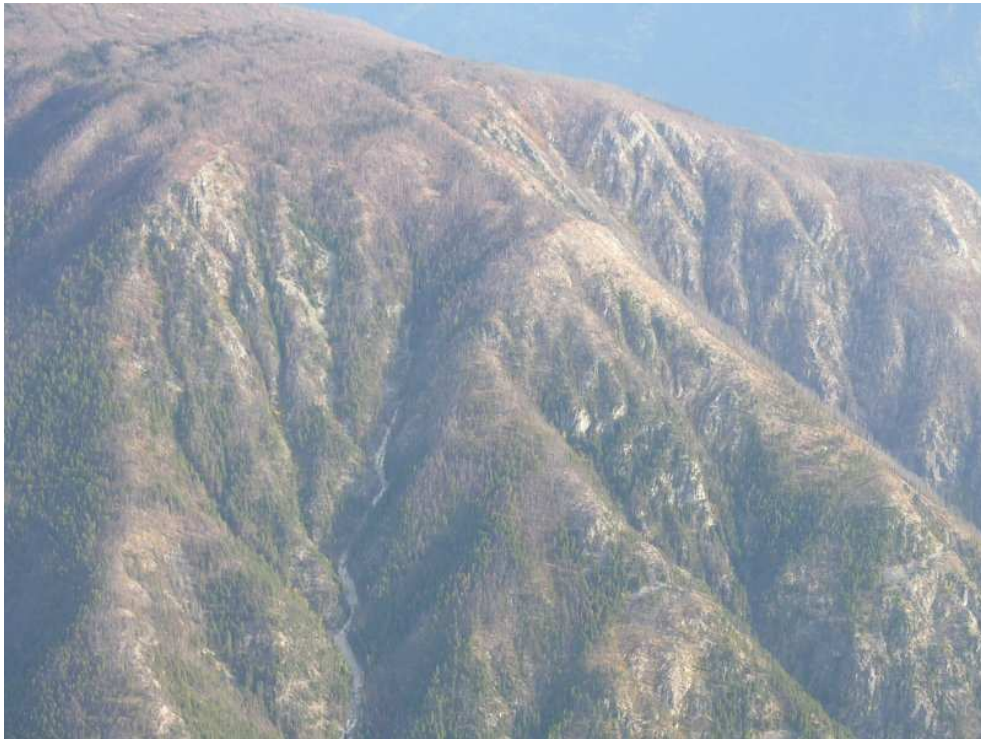
Small debris flows and floods affected the highway and farm properties

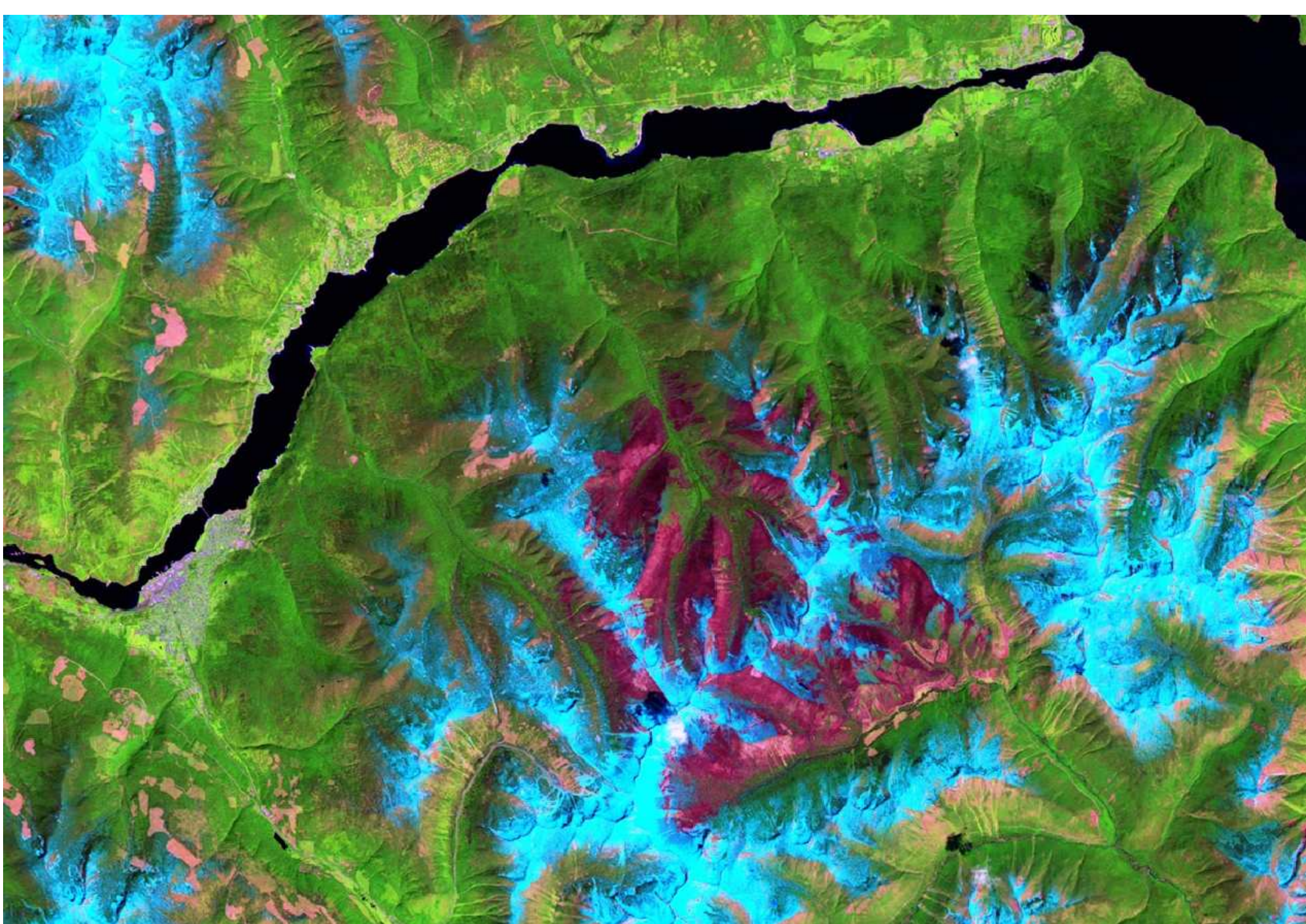
Photo courtesy of Grainger Associates Consulting Ltd.

KELOWNA: Erosion event following 2003 Okanagan Mountain Park fire



INGERSOLL FIRE (Burton):
15 debris flows and landslides
occurred in and below the burn
during a rainstorm in October 2005





2003 Kutetl Fire – no significant landslide, erosion, or flood events have occurred

Post-wildfire risk analysis of the Sitkum Creek fire

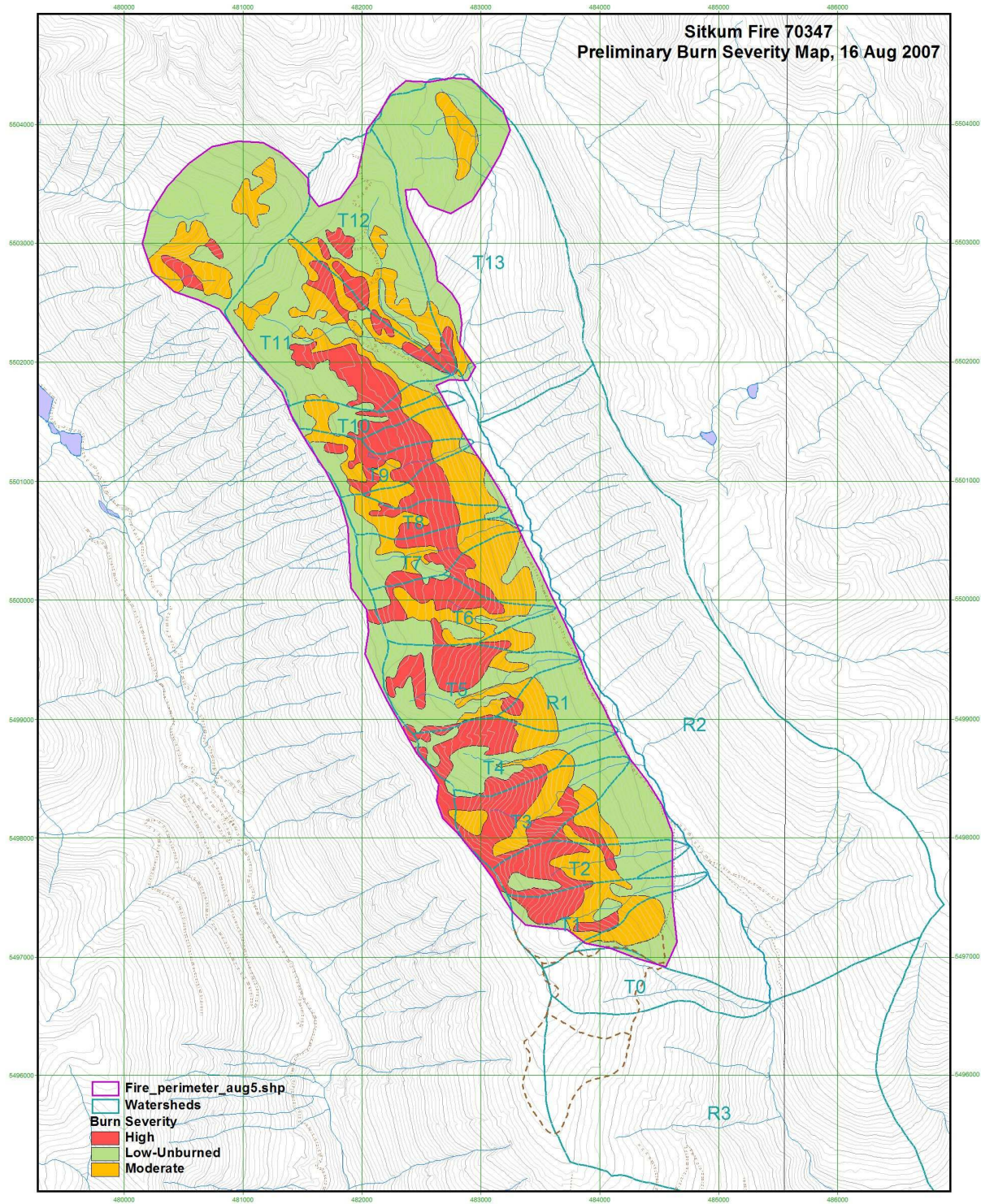
- Aerial photography and preliminary burn severity mapping
- Delineation of watershed boundaries, including tributaries
- Field inspections, to determine soil and stream channel conditions
- Identification of potential hazards (debris flows, flooding etc)
- Recommendations





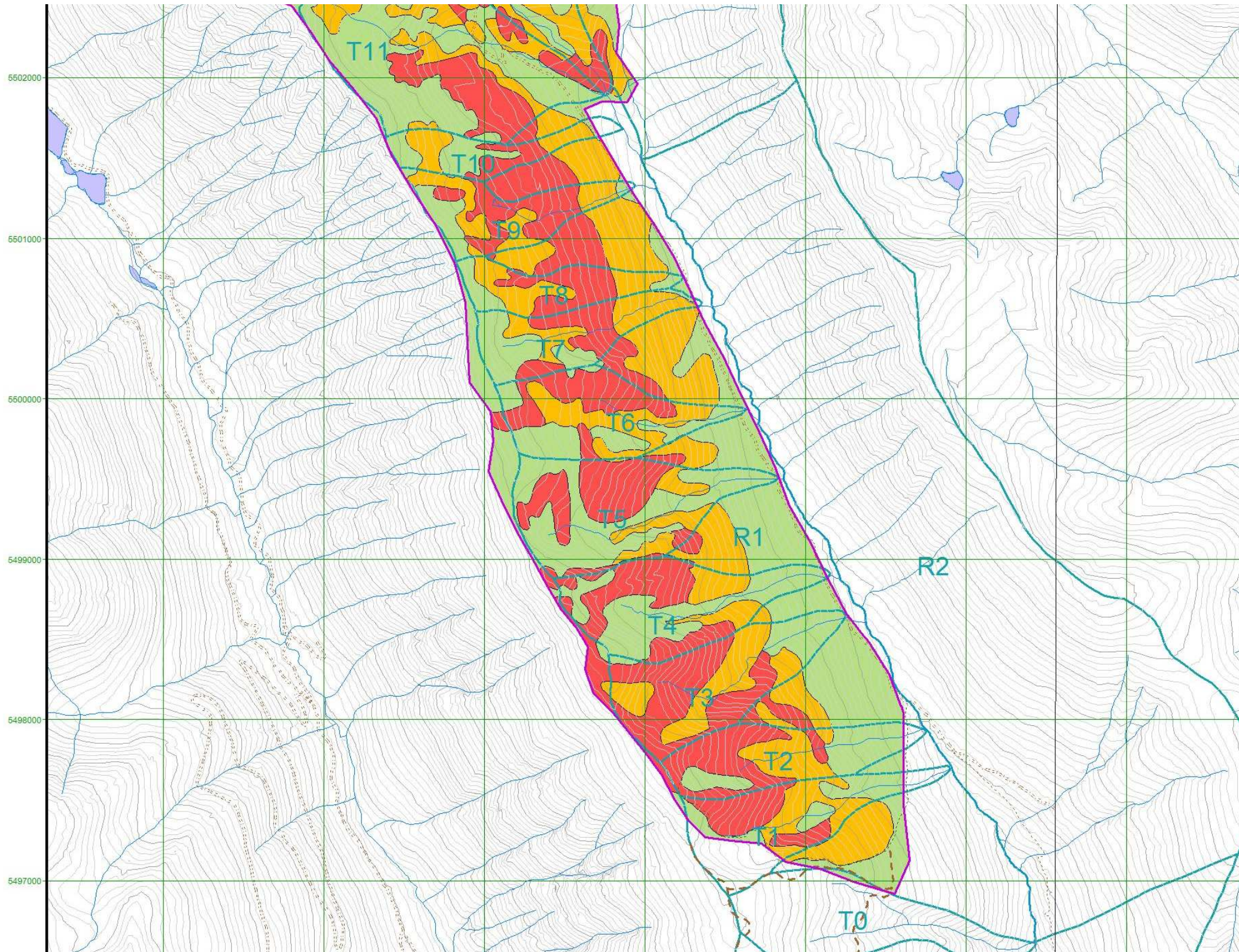


Sitkum Fire 70347
Preliminary Burn Severity Map, 16 Aug 2007



Vegetation burn severity map, hand-drawn from oblique aerial photographs taken 15 Aug 2007.
P. Jordan, A. Covert, BC Ministry of Forests.

0 1 2 3 Kilometers
1 : 20,000









Possible hazards in the Sitkum Creek watershed

- Flooding: Peak streamflows are likely to increase
 - spring snowmelt – possibly around 10-20%
 - summer and fall rainstorms – usually have much lower discharge than spring floods, but they might increase significantly
- Debris floods: These are floods which carry large volumes of sediment and wood, and can cause channel aggradation and avulsions.
- Water quality: For several years, turbidity could be a problem due to erosion or small debris flows in the watershed. (Ash and charcoal may be noticeable in the short term.)







Rehabilitation and mitigation

- Rehabilitation of fire guards and roads – limited to restoring areas affected by fire suppression activities.
- Mitigation of post-wildfire hazards:
 - treatment of severely burned areas
 - engineering treatment of roads below burned area
 - channel and fan – flood preparedness, improvements, defensive structures etc.







Some recommendations:

- Communicate information to stakeholders
- Update the 1990 alluvial fan study to reflect changed watershed conditions
- Consider mitigation treatments in the most hazardous parts of the burned area
- Deactivate the Sitkum-Alpine road in anticipation of increased runoff
- Monitor streamflow and water quality on Sitkum Creek
- Inspect the mine & mill site for possible water quality concerns

