BANFF, KOOTENAY & YOHO NATIONAL PARKS OF CANADA

The Vermilion Pass Fireguard

Wednesday, August 20th 2003 - Driven by strong winds, the Tokumm Creek wildfire in Kootenay National Park doubled in size in a matter of hours. The intense fire burned through Marble Canyon and jumped to the east side of Highway 93S where it turned abruptly eastward and headed for the Bow Valley. However, the Tokumm fire never advanced beyond Vermilion Pass because of the two kilometre-wide Vermilion Pass fireguard.

Fireguards

Fireguards are strategically planned barriers intended to stop or slow the rate of spread of a fire by breaking the fuel available to the fire. A fireguard is made by physically removing the fuel, preburning the fuel, or by reducing the flammability of the fuel through use of water or long-term fire retardant chemicals, or through a combination of methods.

Vermilion Pass Fireguard

Under the right conditions, either the Tokumm Creek or the Verendrye Creek fires had the potential to leave the Vermilion Valley and enter the Bow Valley.

An impassable fireguard was created south of the Vermilion Pass. When completed, the multilayer guard would be 2 km wide.

Cat Lines

From August 11 to 15, six bulldozers (caterpillar tractors) and an excavator created physical containment lines at right angles to the highway on the west and east sides. The locations of these cat lines were chosen for their ability to go as high up the valley as possible. Trees were removed and the soil was scraped clear of burnable material to mineral soil (clay, gravel or bare rock). Facing the Bow Valley, a cat line of 30 m wide was created on both sides of the highway. 150 m south another cat line was created but only one blade width (6 m) wide.

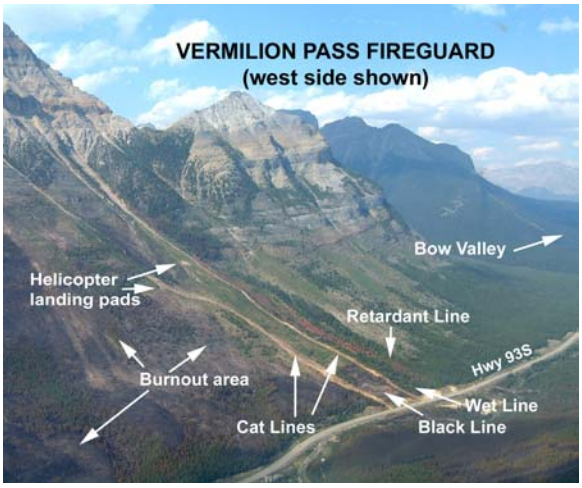

Photo: © Parks Canada, S. Humphries

Wet Lines

With the first cat line in place, more than 2 km of heavy-duty hose (20 cm in diameter) was hauled by the bulldozer to a water source high on a hillside. Every 30 m, a new spur line was installed to service large sprinklers. The sprinklers created a line of soaked vegetation 30 m wide to the north of the cat line. The area between the guards, known as a black line, was also soaked.

Retardant Lines

On the west side of the highway, helicopters laid down a 20 m wide line of long-term retardant (a mixture of chemicals and water) parallel and north of the wet line. On the east slope, small sections of steep terrain at the upper end of the cat line were also treated with retardant.

*Black Line*s
On August 16th, wind conditions were favourable to burn the 150 m strip between the cat lines by using hand torches to ignite fuels and create the "black line".

Completing the Fireguard
With all vegetation burned off, the fireguard was now more than 200 m wide including the cat, black, water and retardant lines. However, fire prediction models forecast that wind might send sparks and embers more than 1 km in front of advancing forest fires.

To expand the fireguard, a 2 km wide stretch of forest was burned south into Kootenay National Park. Starting on August 17th when wind conditions were favourable, crews ignited a series of strips parallel to and south of the cat guards. The strips were lit from helicopters using two methods: self-igniting ping-pong balls filled with fire starting chemicals; and drip torches that released slow-burning flaming fuel at a precise rate. Other helicopters patrolled for any minor spot fires that escaped the cat lines.

The burnout was completed on August 20th, the same day that the Tokumm fire took its anticipated run. Sparks and embers from the fire started several spot fires up to ½ km in advance of the main fire. The Vermilion Pass fireguard successfully held the Tokumm fire.

Infrared scanning equipment is currently being used to patrol for warm spots outside the fireguard before they can start new fires.

The Impact of Fireguards on the Environment
Fireguards are significant environmental disturbances and are not undertaken lightly.

Fire Retardant
Long-term fire retardants used by Parks Canada are considered to be non-toxic to terrestrial organisms and of low to moderate, but short-term toxicity, to aquatic organisms (see the August 26 fact sheet "Fire Suppressant and Retardant Use in the 2003 Wildfires" for details).

Cat Lines
Because cat lines disturb the soil, they increase potential for wind and water erosion and possible siltation issues for aquatic systems. Non-native plants may invade disturbed soils. Cat lines on steep slopes have the potential to bring avalanches into new areas. Cat lines also create aesthetic concerns by introducing straight lines into the scenery.

Black Lines and Burnouts
These areas have similar impacts to natural wildfire and the fire-dependent ecosystem quickly recovers.

Mitigations
During establishment of the fireguard, special consideration was made to protect any stream crossings from disturbance by heavy equipment. No retardant was applied within 30 m of aquatic areas.

A rehabilitation strategy is being developed for the environmental impacts associated with the 2003 fire activities, including the Vermilion Pass fireguard. The rehabilitation strategy includes:

- Re-contouring the cat lines to reduce runoff, preventing siltation of waterways, reducing visual impacts, reducing the possibility of avalanches reaching the highway, and returning sites to their natural configuration.
- Stabilizing steep slopes to prevent future slumping.
- Replacing soil and other organic materials on disturbed ground and reseeding with native vegetation where necessary.
- Transplanting of native stock to provide screening from highway.
- Monitoring for short and long-term impacts to water quality caused by retardant or from siltation.
- Follow-up monitoring of revegetation success and non-native vegetation establishment. Monitoring of plant and animal distribution after rehabilitation.

RMacD. / SHump. Aug 27/03