



Investigation: Landslide on Block T144 Kitsuksis Creek
Managed Forest #7
Beaufort Range Port Alberni

Owner: TimberWest Forest Corporation

Investigation: IN0644-SR Beaufort Block T144

Date: February 22, 2007

Investigation Report by: Stuart J Macpherson RPF, CEA
Executive Director
Private Managed Forest Land Council

Technical Expert: Gordon Butt M.Sc, P.Geo, P.Ag
Madrone Environmental Services Ltd.

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1.0 INTRODUCTION

During the week of November 14, 2006, a severe winter storm crossed central and southern Vancouver Island. On December 4, 2006 TimberWest reported to Council office that there had been a slide on block T144. The slide had occurred into a stream and had run-out below Timber West's property, damaging a culvert on the Rail America rail line, crossed the Log Train Trail and then deposited debris and sediment into a tributary of Kitsuksis Creek. As a consequence muddy water downstream had been drawn into the water intake of the McLean Mill fish hatchery. The lowered oxygen levels were expected to cause a high mortality of the coho salmon eggs.

TimberWest said that the block had been logged in 1998 so there was some doubt as to whether the *Private Managed Forest Land Act* would be applicable to the situation. Also that a small number of log loads had been trucked on a spur road on Block T144 from an adjacent block that was logged in the spring of 2006. I requested that TimberWest provide more information on the event and I would then decide whether an inspection would be warranted.

2.0 BACKGROUND

Chronology of Significant Events

On or about December 10, 2006 I received a message from Al Magnan, habitat management biologist, Fisheries and Oceans Canada (DFO). He had made a joint inspection of the slide accompanied by Dave Clough, consulting fisheries biologist representing the fish hatchery and Dave Lindsay, fisheries biologist with TimberWest. They had assessed the impact of the slide and discussed a remediation plan. Mr. Magnan felt that the origin of the slide was caused by a blocked culvert on block T144 and requested that Council undertake an investigation of the circumstances. Also that DFO were not considering any action against TimberWest.

On December 15, 2006 I had a telephone conversation with Dave Clough. He is the fisheries biologist for the McLean's Mill fish hatchery. He said that it appeared that a culvert on Block T144 had become plugged during the November storm, causing an overflow of water down the ditchline, which then supersaturated a steep slope (approximately 30%), resulting in the slide into Kitsuksis Creek. He said that after the joint field inspection with TimberWest and the DFO a nine-point plan was drawn up to mitigate the impacts. He was complimentary toward TimberWest concerning the company's response to the situation. He said that there was nothing about the terrain characteristics of Block T144 to indicate that there would have been a problem.

On or about December 20, 2006 I retained Gordon Butt, P Geo, consulting geoscientist of Madrone Environmental Services Ltd. to undertake an onsite assessment of the slide. I asked Mr Butt to collect the facts concerning the event and to provide an opinion as to the probable cause. My intention was to draw on the information in his report to decide whether there were grounds to allege that Timber West may have contravened the Private Managed Forest Land Council regulation. Hereon after I shall reference Mr. Butt's assessment in this report.

On January 15, 2007 Mr. Butt made his inspection of the event on Block T144. He was accompanied by Rod Davis from Council and Andy Hasenen, road foremen with TimberWest.

On February 7 2006 TimberWest provided me with information and documentation concerning their most recent use of the road and verbal advice concerning progress with their mitigation work of the slide. They had contacted the affected parties and were proceeding with implementing their plan.

3.0 SCOPE

The investigation is concerned with determining whether the TimberWest may have contravened the *Private Managed Forest Land Act* or regulations through its activities on Block T144.

Although TimberWest self-reported that there had been a slide on Block T144 as per the *Act* there is a question of whether the *Act* applies to this situation.

4.0 LOCATION & OWNERSHIP

Block T144 is located on the east side of the Beaufort Range on the toe of a south-facing slope. This block is located 7.2 km north-northwest of Port Alberni. The Rail America rail line (currently not in use) and the Log Train Trail (a recreation trail) run approximately parallel in an east-west direction south of TimberWest's property.

That TimberWest is the owner of private managed forest land where the slide occurred is not in dispute. The property is part of Managed Forest #7 owned by the company.

TimberWest logged the Block in 1998. Three spur roads off the MacLean Main provided on-block access. Presumably these roads were built that year or before. This raises the question of whether the *Private Managed Forest Land Act* has jurisdiction as the logging and road construction was completed before the *Act* came into effect, i.e. August 3, 2004.

5.0 FINDINGS

Does the Act have jurisdiction?

TimberWest advised me that the Block was harvested in 1998. The spur roads on the block only provide access to Block T144. Also the company provided me with a logging plan map for an adjoining block T334 (4.5 ha) to the west of Block T144 that was heli logged between December 2005 and April 2006. They said that approx 20 loads (700m³) were trucked out on Spur 200 of Block T144. Also that the spur road was in good condition and did not require any upgrade before use. I was also provided with a copy of a Post Logging Inspection report dated April 28, 2006. This report indicated that ditches and culverts had been cleaned out (presumably in the spring).

Given these facts I conclude that the *Private Managed Forest Land Act* has jurisdiction.

As there was no harvesting or road deactivation of the Block in question, the jurisdiction concerns a question of road maintenance during the period of the activity. Therefore the section of the Council regulation covering soil harvesting requirements for timber harvesting access structures would be applicable i.e. Section 13.

Is there a potential contravention of Section 13 (1) (a)?

The relevant provision of Section 13 states:

13 (1) An owner who carries out timber harvesting on an area and constructs or uses any roads, landings and excavated or bladed trails, must ensure that

- (a) the access structures are constructed and maintained in a manner that
 - (i) minimizes any soil erosion, and
 - (ii) minimizes any increase in landslide hazards

Gordon Butt's inspection report provides critical information that helps in answering this question. His report is comprehensive and thorough and provides a detailed description of the event from the blocked culvert on Spur 200, the slides beside stream 7, the effect on the stream banks on the Block and the run out below the Block across the Rail America line, across the Log Train Trail and on down into a tributary of Kitsuksis Creek.

It is recommended that Council review Mr Butt's report in detail to gain an understanding of his account of the event and his conclusion as to the cause. Reference should be made to the map and photographs, Figures 1-6, in his report as they are particularly helpful in understanding the event. I will provide a summary of Mr. Butt's opinion and the salient points relevant to the sections of the Council Regulation in question.

What happened?

Mr Butt's report, Section 1 paragraphs 2 and 3 and Section 4 provides a description of the slide and the impact downslope. He says that a flow in Stream 7 was partly diverted along Spur 200 due to a culvert blockage. The remaining flow in the natural channel (of stream 7) was sufficient to trigger a debris slide and deeply scour lower reaches of the channel, before crossing the rail line, the Log Train Trail and entering a tributary of the fish-bearing Kitsuksis Creek.

The diverted flow traveled 30 metres along Spur 200, and then downslope (underground) emerging below some bedrock outcrops where local saturation triggered a larger debris slide. This slide deposited roughly half of its debris on the slopes below, and half was delivered to Stream 7 downslope of Spur 100, thus augmenting the already surcharged water.

The entire length of Stream 7 downstream from Spur 100 has been affected; in places through severe bank erosion, in other places through localized deposition of sediment in gently sloping reaches. At the Rail America line, the debris buried the culvert, and then water eroded the fill. The same happened again at the Log Train Trail. Sediment was delivered to a tributary of Kitsuksis Creek and then probably reworked in this channel to be delivered to Kitsuksis Creek itself.

What caused it?

In Mr Butt's opinion the 600 mm culvert at Sta. 0+407 on Spur 200 was inadequate to accommodate the storm flow on November 15, 2006. Fine woody debris (i.e. a stick) in the

culvert likely caused the culvert to block, leading to water overflow and diversion down the road. It is likely that the stick would have been picked up and carried down the ditchline by the extremely highwater flow until it became stuck in the culvert inlet.

Notwithstanding the diversion of part of Stream 7 flow along Spur 200, the remaining flow was large enough to trigger Slide 1 downstream. In addition, it was enough to severely erode the roadbed in Spur 100 and to degrade the channel (on steeper reaches) in Stream 7 downstream of Spur 100.

Could it have been prevented?

Mr Butt states that there was no indication of inherently unstable terrain in the areas where the debris slides occurred. TimberWest staff could not have reasonably known that sensitive terrain was located in this block. In his view a larger culvert may have been more able to handle the storm waterflow but he is not of the opinion that culvert size was a contributing factor to the event. Also that deactivation of the spur roads would not have made a substantial difference to the event. The grade of Spur 200 in the vicinity of the culvert and the diversion was gentle (3-5%); in general water bars or cross-ditches are installed where grades are greater than this. The flow diversion resulting from the failed culvert probably did not make a big difference in the impact, aside from the additional sediment and the site disturbance

Mr Butt's conclusion

Mr Butt concludes that had the culvert on Spur 200 not failed, Slide 1 would still have occurred, and severe erosion of the Spur 100 road and downstream reaches of Stream 7 would still have been scoured. The effect of the diversion on Spur 200 was to increase the amount of sediment transported downstream to the base of the slope. However, damage would likely have occurred without the blockage of the culvert.

In his opinion the slide event in T144 and the resulting damage to infrastructure and fish habitat downstream can be attributed to the unusual magnitude of the storm, and not to a failure of TimberWest to manage water on its land.

Further, being cognizant of the effects of this storm on other areas in the Beaufort slope, he concludes that the impacts are due to an unusually large storm that simply overwhelmed certain creeks. He suspects that Slide 1 would have occurred even if Block T144 had never been developed

Mitigation work by TimberWest

TimberWest has developed a remediation plan involving seeding and revegetation of disturbed areas, enlarging sumps upstream of crossings and ensuring flow remains in natural channels. They are also undertaking work on their neighbors property i.e. repairing the culvert on the Rail America line. They are also undertaking a number of actions to improve the water supply intake and distribution system to the fish hatchery.

6.0 CONCLUSION

With respect to section 13(1) of the Council regulation, based on the foregoing and the information provided to me by Gordon Butt in his report I am not convinced that lack of road maintenance was the prime cause of the slides on Block T144. Timber West had completed a road inspection approximately six months before the storm. Given that the road is located on low risk terrain I would not have expected another inspection to be made in the fall of 2006.

Based on the foregoing, I do not have grounds to allege that TimberWest may have contravened sections 13 of the Private Managed Forest Land Council regulation.

I recommend that the investigation be closed.



Stuart J Macpherson

Executive Director