



**Investigation: Road Construction Practices on
Block T141 Managed Forest #7
Beaufort Range Port Alberni**

Owner: TimberWest Forest Corporation

Investigation: IN05019 Beaufort Block T141

Date: February 28, 2006

Technical Expert: Shawn Hamilton RPBio

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

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1.0 INTRODUCTION

It is alleged that TimberWest Forest Corp (the Owner), as registered owner of Lots 1350 (PID 008-732-396), 1011 (PID 008-707-715), and 1032 (PID 008-707-723), within Managed Forest #7, contravened sections 14(2)(c) and 15(b) of the Private Managed Forest Council Regulation by failing to prevent excavated soil from entering a stream and by failing to minimise soil erosion into a stream in block T141. This results from the main access road constructed during summer 2005.

2.0 BACKGROUND

Persons Referenced

Several persons were involved during the course of this investigation. The following persons are referenced in this report and the persons' affiliations.

- Stuart Macpherson Executive Director Private Managed Forest Land Council
- Shawn Hamilton Technical expert and professional biologist
- Wayne Crowley Complainant and property owner
- Al Chatterton TimberWest Forest Corp
- John Philips TimberWest Forest Corp
- Steve Lorimer TimberWest Forest Corp
- Gary Anderson Health Officer, Vancouver Island Health Authority
- Mark Palmer Ministry of Forests and Range, South Island Forest District

Chronology of Significant Events

On December 27, 2005

I had a telephone conversation with Mr. Wayne Crowley (the Complainant) in which he was critical of the logging practices of the Owner on the block on the hillside immediately behind his property. He alleged that the roads on the subject block were poorly constructed, that there was inadequate culverting, no ditches, lack of gravel on the road surface and that grapple yarding was straight up the contour. His concern was that these practices could be the trigger of water quality problems downstream. He requested that Council inspect the logging practices on the Owner's property. I explained the provisions of the Council's regulation, enforcement powers and the investigation process to the Complainant. I faxed him a copy of the Inquiry/Complaint form and requested that he make any complaint as specific as possible.

On January 5, 2006

The Complainant telephoned in a complaint to the Private Managed Forest Land Council that a tributary of Beaver Creek on his property (Woodward Creek) was flowing muddy. He suspected that there must have been a washout (of a culvert) on the adjacent property of the Owner. He was concerned about the situation on his property and said that the creek junction is approximately ¼ mile above the Beaver Creek Water Improvement District water supply intake, where it joins the Stamp River.

I received an e-mail from Mr Mark Palmer, Compliance and Enforcement Officer, Ministry of Forests and Range South Island Forest District, concerning the high stream flow and

muddy water. He attached two photographs illustrating streams allegedly running through the complainant's property that were muddy and that were allegedly originating from the Owner's property.

On the basis of the complaint and these photographs I decided to have an inspection of the Owner's property. I retained for Shawn Hamilton, professional biologist, to make an inspection of the Owner's harvesting activities on Block T141 and to inspect the Complainant's property. This was arranged in cooperation with the Complainant and the Owner to take place the following day.

Figure 1 illustrates the approximate location of the subject block on the Beaufort Range near Port Alberni.

Late afternoon on January 5, 2006 I was advised by the Owner of two slide events that had occurred within the Owner's property along the Beaufort Range. The first was a debris slide originating from block T141 in a stream on their property. Most of the debris, consisting of sand, gravel and woody debris, was deposited on Crown forest land, and some on the Complainant's property. A second slide had occurred at high elevation in the Deer Creek area above block T172. It was a reactivation of a known unstable area. The run-out zone and debris was primarily confined to the block, although it had washed out an old culvert on the Log Train Trail. (A third slide had occurred at high elevation in the headwaters of Hal Creek. This was also a reactivation of a previously unstable slide area. It is a natural slide; the Owner does not have any operations in Hal Creek catchment. These events are illustrated in the photographs in Appendix 1.

I undertook a search of the Ministry of Sustainable Resource Management website to determine if Beaver Creek is a community watershed as defined in the Private Managed Forest Land Council Matters regulation. It was not listed. I then contacted the South Island Forest District and the Ministry of Environment Water Improvement Branch on January 16, 2006 who verified that Beaver Creek is not a designated community water supply area under the *Forest and Range Practices Act*. This means that Part 3 Division 4 of the Private Managed Forest Land Council regulation is not applicable to this case; in particular section 21, which deals with concerns about water supply quality identified by a water licence holder.

On January 6, 2006 afternoon

Mr. Hamilton telephoned from Port Alberni and advised me of the preliminary results of his inspection. He found that there had been a blocked culvert at a stream crossing that appeared to be associated with high water flow and scouring of stream banks in block T141. One of the streams had overflowed its bank on the Complainant's property, eroding a road surface and depositing silt. I decided to elevate the inspection to an investigation at this point.

I provided the Complainant with a written acknowledgement of his complaint received verbally by our Council office. On or about the same date I began my investigation into the merits of the complaint.

On January 9, 2006

I met with Mr. Hamilton to review the preliminary results of his initial inspection of Block T141 and the Complainants property. I directed Mr Hamilton to make a further site inspection of Block T141 to collect additional the facts concerning the event and to keep me briefed as his review progressed. I shall be referencing Mr. Hamilton's technical assessment throughout this report.

On January 11, 2006

I advised The Owner by letter that I was investigating potential contraventions of sections 13, 14, 15 of the Private Managed Forest Land Council Act.

On January 13, 2006

Council received a letter from Lidstone, Young & Anderson, barristers and solicitors on behalf of the Beaver Creek Water Improvement District suggesting that the two boil water advisories issued in the past month may have been caused by the Owner's logging activities and request that Council look into the matter.

I undertook a search of the Land and Water BC website listing of water licenses to verify that the Complainant is a holder of a water licence for Beaver Creek. Mr Wayne Crowley is listed as the holder of Water Licence C044014, since 1974, for domestic use on Woodward Creek, which I believe is a tributary of Beaver Creek.

Mr Chatterton requested the go ahead to replace the block culvert at crossing C-11 on stream 4 and to rehabilitate the backspar trail crossing stream 4 below the road. As the remediation work would not compromise the investigation I gave my approval. I was also advised that Fisheries and Oceans Canada approval for in-stream work had been obtained.

On January 16, 2006

I met with Shawn Hamilton to review progress with the investigation and send a request to the Owner for additional information needed for the investigation

I attended a meeting of the Beaver Creek Water Improvement District as an observer. Gary Anderson from Vancouver Island Health Authority also attended. The meeting was called to discuss the January 5 storm and events that may have lead to an increase in water turbidity levels with the Owner. Mr Chatterton explained that in the week leading up to January 5, 2006 storm Port Alberni had been experiencing an extended period of heavy rainfall, with snow at higher elevation. On the evening of January 4 a further rainstorm resulted in snow melting at the high elevations and peak water flows in the catchments of Beaufort Range. Slides occurred in the Deer Creek and Hal Creek in naturally unstable areas at high elevations. In his view the storm was equivalent to a one in every 25 to 50 year storm. This resulted in elevated siltation levels in all the streams in the catchment area but was exacerbated by the contribution of silt from the natural slides in the Deer Creek and Hal Creek.

On January 17, 2006

I received a letter from Scott Fraser MLA requesting that council investigate logging practices on private forest land due to his constituents concern with water quality.

On January 26

I made a reconnaissance of the Owner's current operations on their Beaufort properties by helicopter. The purpose was to familiarize myself with harvesting and roads constructed on block T141 and other active blocks. I viewed block T025 (Cherry Creek), T141 (Beaver Creek), and Wolfe Creek blocks. I also viewed the slides in Hal Creek and Deer Creek. The owner did not have active operations in these two areas. The reconnaissance provided me an understanding of the nature of the Owner's road construction and harvesting practices, and a landscape-level impression of the impact of the storm of January 5, 2006 on the property.

3.0 SCOPE

The investigation is concerned with determining whether the Owner may have contravened the *Private Managed Forest Land Act* or regulations through its activities on Block T141. Council does not have the jurisdiction to investigate compliance with the *Water Act* on the Owner's property or the Complainant's property.

The investigation was triggered by the Complainant's allegations concerning the Owner's activities on its property. His contention is that as a consequence of these activities that there has been damage to his property. He alleges that a low standard of road construction resulted in excessive stream flows that caused one stream to overflow its bank on his property, causing rutting on sections of his road, a culvert washout and deposits of silt around his sawmill building. Also that a separate dry stream had begun to flow down onto another section of a road on his property causing deep ruts.

The Beaver Creek Water Improvement District issued a boil-water advisory to its customers after the January 5, 2006 storm due to elevated turbidity levels measured at the water intake and monitoring stations. This investigation does not include determining the root cause of the boil-water advisory issued by the Beaver Creek Water Improvement District or the quality of water supply that is being supplied. Such a matter would be within the jurisdiction of the *Drinking Water Protection Act*, which for Vancouver Island, is administered by the Vancouver Island Health Authority.

4.0 LOCATION

Block T141 (the Block) is located on the east side of the Beaufort Range. It is just beyond the end of Cameron Road, which runs north of Port Alberni. Figure 1 shows the location in the Beaver Creek catchment.

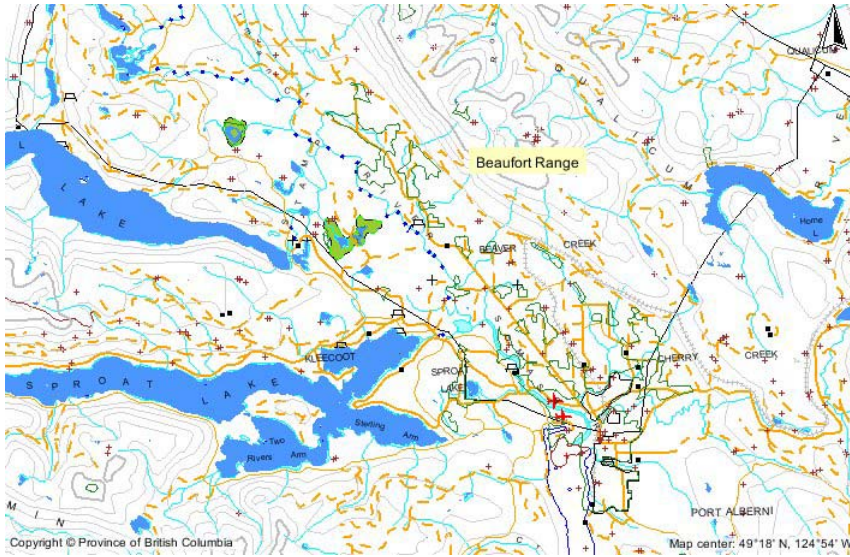


Figure 1: Overview Map

The property joins Crown forest land (Lots 257, 275) along the southern boundary. The Crown land is part of Woodlot #11, administered by the Ministry of Forests and Range, South Island Forest District. The Log Train Trail (a remnant former railway grade) runs along the southern boundary. The Complainant's property is south west of the Crown land, immediately south of and adjacent to some sections of the Log Train Trail.

The Block lies on a southwest-facing hillside with moderate slopes ranging from 25 to 75%. The gross area is 60.8 hectares. The terrain is illustrated shown in Appendix 2 and 3. The cover photograph on Mr Hamilton's report shows the Block on the hillside behind the Complainant's property. (In the foreground)

The operating plan map for the Block (Figure 3) shows the terrain, the streams and access roads constructed. The Owner constructed the access road on the Block during May to August 2005. This road traverses up the hillside with three switchbacks then joins an older road system at the top of the block.

There are nine streams within the block. Three are the subject of this investigation; they are noted as streams 4, 5, and 6.

The sketch map (Figure 2) shows the access road, the three streams and the crossing (culvert) locations on these streams. Reference locations are taken from Mr. Hamilton's report.

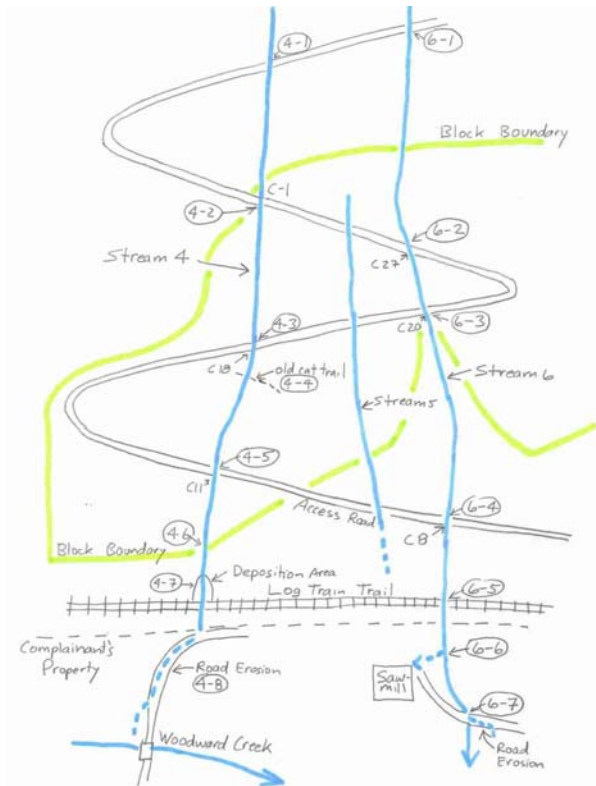


Figure 2: Streams 4 and 6, Block T141 (not to scale)

5.0 ALLEGATION

From my review of the facts outlined in Mr. Hamilton's report it appears that the owner has contravened sections 14(2)(c), and 15 (b) of the Private Managed Forest Land Council regulation as road construction practice did not prevent excavated soil from directly entering into a stream and has not ensured that soil erosion into a stream is minimized with respect to three crossings on stream 4 and one crossing on stream 6. The allegation does not concern stream 5.

Contravention of Section 14 (2) (c)

The relevant provision of Section 14 states:

14 (2) An owner who constructs, deactivates or rehabilitates a road, landing, excavated or bladed trail or other similar access structure must ensure that the construction, deactivation or rehabilitation is carried out so as to meet all the following requirements:

- (a) streams are maintained in their natural or existing courses;

- (b) the structure does not become unstable to the extent that its instability contributes to landslide debris entering fish streams or streams in water supply areas;
- (c) excavated soil does not enter directly into streams.

The elements of the contravention that must be established are:

- That TimberWest Forest Corporation is the owner of the land where the alleged contravention occurred;
- That the land where the alleged contravention occurred is private managed forest land;
- That the owner constructed a road during the period that the *Private Managed Forest Land Act* was in force (i.e. after August 1, 2004);
- That the road was not constructed in a manner that prevents excavated soil from entering directly into a stream.

TimberWest Forest as owner

A search of the 2005 Managed Forest Assessment Roll provided by the BC Assessment Authority lists TimberWest Forest Corp, as registered owner of Lots 1350 (PID 008-732-396), 1011 (PID 008-707-715), and 1032 (PID 008-707-723), within Managed Forest #7. The operating plan (Appendix 3) shows that Block T141 straddles these three Lots.

At no time has the owner's representative, Mr. John Philips, disputed that TimberWest Forest Corporation is the owner of the land. It is submitted that TimberWest Forest Corporation is the owner of the land.

Area is private managed forest land

A search of the council file for Managed Forest #7 reveals that the land in question (Lots 1350, 1011, 1032) is listed in the schedule of parcels that comprise Managed Forest #7. These properties were accepted as private managed forest land on October 15, 2001 in a letter to the Owner from the Land Reserve Commission. Also these lots are listed under Managed Forest #7 in the 2005 Managed Forest Assessment Roll provided by the BC Assessment Authority to the council.

The term private managed forest land is defined in section 45(1) of the *Private Managed Forest Land Act* as follows:

- 45 (1)** On the coming into force of this section, any land that was classified as managed forest land under section 24 of the *Assessment Act*, as it read immediately before its re-enactment by this Act, is deemed to be private managed forest land under this Act and managed forest land under the *Assessment Act* without the owner having to submit a management commitment under section 17 of this Act, and the owner must comply with this Act and the regulations.

It is submitted that the Block is private managed forest land.

Owner responsible for road construction

The term road construction is not defined in the *Private Managed Forest Land Act* or regulations. However with the forest sector is generally accepted that it includes all those activities necessary to build a road to a standard sufficient that permits the safe operation of logging trucks, while minimizing environmental impact. This involves construction of subgrade, ditchlines, installation of culverts, bridges, and ballasting of the road surface.

The owner admitted that they designed and built the road on the Block sometime during May to August 2005. This is after August 3, 2004, the date when the Private Managed Forest Land Council regulation came into effect. As further evidence, the Owner provided a copy of an approval letter dated January 5, 2005 from the Ministry of Land, Water and Air Protection (now Ministry of Environment) to construct stream crossings under Section 9 of the *Water Act* and a copy of a Road Construction Pre-Work meeting with the contractor, dated April 19, 2005.

Soil entering stream

Stream 4 and stream 6 are identified on Figure 2. There are three (culverts) crossings on stream 4. These are noted as C-1, C-18 and C-11 in Mr. Hamilton's report. Of the four crossings on stream 6, only one, C-27, is in question. I shall deal with each of these crossing locations separately and cross-reference to Mr. Hamilton's report as needed.

Crossing C-1

It is the most upstream crossing on stream 4 within the Block. It is uphill from the second switch back. A 800mm diameter metal culvert is installed at this location. The condition of the culvert inlet and outlet on January 6, 2006 is described in Mr. Hamilton's report in section 7.1.2.

Photo 4 shows that the culvert inlet was partially plugged with sediment and debris.

Section 10 Plate 1 shows the culvert outlet. The culvert pipe barely protrudes beyond the road fill. There is insufficient protection of the road fill placed around the culvert, allowing sediment to erode into the stream. The quantity of sediment that entered stream 4 at this location is not estimated.

Crossing C-18

The crossing is midslope on the Block after the first switchback on the road. An 800m diameter metal culvert is installed at this location. The condition of the culvert inlet and outlet on January 6, 2006 is described in Mr Hamilton's report in section 7.1.2.

Photo 5 shows a fresh deposit of sediment at the culvert inlet causing a partial blockage.

Photo 6 shows the culvert outlet. The outlet is not protected. Road fill placed around and above the culvert has been eroded, resulting in sediment entering the stream. The quantity of sediment that entered the stream at this location is estimated.

Crossing C-11

This is the most downstream crossing of stream 4 on the road in the Block. A 600mm culvert was installed at this location. The road design called for a 800mm diameter pipe. The reason for the change was not examined. The condition of the culvert inlet and outlet on January 6 is described in Mr. Hamilton's report in section 7.1.2. Mr. Hamilton's report describes that the Owner found that this culvert was plugged at 6.00 am on January 5, 2006 and that water was flowing over the road surface. He describes that water flowed down the ditchline and across the road and into the block below the road. Immediately after this discovery the Owner had an excavator remove the accumulated sediment from around the culvert inlet. This timely action meant that the culvert did not wash out and the road surface was not damaged, as the road ditch was able to handle the overflow of water at the time.

Photo 8 shows the condition of the culvert intake on January 6 after it had been cleaned out on January 5, 2006.

Photo 40 shows the condition of the culvert outlet. Road fill around the fill can be seen to be eroding. The culvert is too short, allowing water to erode excavated material at the base on the outflow. There is no protection around the culvert to prevent erosion of the fill. The fill slope beside the culvert is buttressed by logs and compacted material to provide stability to the road surface. The lack of protection around the culvert outlet has allowed road fill to erode and enter the stream.

Mr. Hamilton's report on pages 27 and 28 and in photos 36 and 37 shows the condition of crossing C-11 on January 31, 2006 after a new 1000mm diameter metal culvert was installed. This is a textbook example of a well-installed culvert. The inlet has a deep catch basin and is amply protected with rock riprap. On the outlet side the fill has been sloped and riprapped with rock. The culvert is properly angled so that the water flow is dispersed on the riprap. Both sides have been grass-seeded to provide stability.

Note that on January 13 the owner received approval from myself to undertake this repair work. At that time I was satisfied that Mr. Hamilton had collected sufficient evidence at this location for the investigation.

Crossing C-27

It is the most upstream crossing on stream 6 within the Block. A 1200 mm metal culvert was installed at this location. The condition of the culvert inlet and outlet on January 10, 2006 is described in Mr Hamilton's report in section 7.3.2.

Photo 21 shows the condition of the culvert intake.

Photo 22 shows the condition around the culvert outlet. There is no protection of the road fill and road fill is able to erode into stream 6.

The normal practice in conditions on the coast where erodible material is encountered is to employ measures when installing culverts that ensure the outflow does result in erosion of the road fill and to stabilize the fill slope around the culvert outlet. The measures employed by the Owner at all four crossing locations do not conform to generally accepted road construction practices in similar soil conditions. (Reference - The Handbook of Best Management Practices for Private Forest Land in British Columbia 2001)

Contravention of Section 15b

The relevant provision of Section 15 states:

15 An owner who carries out, adjacent to a stream, timber harvesting or related activities, silviculture activities, or road construction or deactivation activities, must ensure that those activities meet all the following requirements:

- (a) stream channels, banks and gully side walls are not destabilized or damaged; soil erosion into streams is minimized;

The elements of the contravention that must be established are:

- That TimberWest Forest Corporation is the owner of the land where the alleged contravention occurred;
- That the land where the alleged contravention occurred is private managed forest land with the meaning defined in section 45(1) of the *Private Managed Forest Land Act* and the *Assessment Act*;
- That the owner constructed the road during the period that the *Private Managed Forest Land Act* was in force (i.e. after August 1, 2004);
- That the road was not constructed in a manner that did not minimize excavated soil from entering directly into a stream.

TimberWest Forest as owner

Refer to section above

Area is private managed forest land

Refer to section above

Owner responsible for road construction

Refer to section above

Excavated soil entering stream is minimized

The condition of the four crossings C-1, C-11, C-18, C-27 and the road construction/culvert installation practices is the same as described in the section Soil entering stream above.

The culverts C-1, C-11, C-18 were installed in a manner that allowed the possibility for excavated material or road fill to enter the streams 4 and 6. Mr Hamilton's report in Table 1 estimates the volume of sediment entering the streams from these locations is about 2-4 m³. The total sediment contribution from all sources, channel scour, upslope areas, and historic and current road crossings, according to Mr Hamilton's estimate ranges from about 140-150 m³.

If the crossings had been installed using measures designed to prevent soil from entering the streams, such as like that used on the replacement culvert on crossing C-11, then soil erosion would have been minimized.

6.0 REMEDIATION CONSIDERATIONS

The *Private Managed Forest Land Act* empowers the Council to establish one or more administrative remedies if the Council determines that the owner has contravened a requirement of the Act or regulations. Specifically the Council may impose penalties under section 26, and remediation orders under section 27 of the Act.

Financial Penalty

The maximum penalty that may be imposed for a contravention of the Act or regulation is \$25,000. The council may decide to not levy a penalty if it considers the contravention trifling.

When determining the amount of a penalty under section 26(5) the council must consider it must consider all of the following:

- (a) any previous contravention of a similar nature by the person if the contravention was the subject of
 - (i) a determination under this section in the previous 10 years, or
 - (ii) a consent agreement under section 25 in the previous 12 months;
- (b) the gravity and magnitude of the contravention;
- (c) whether the contravention was repeated or continuous;
- (d) whether the contravention was deliberate;
- (e) any economic benefit derived by the person from the contravention;
- (f) the person's cooperation and efforts to remedy the contravention;
- (g) the person's efforts to prevent the contravention;
- (h) whether relevant forest management objectives specified in Division 1 of Part 3 are being achieved despite the contravention.

When evaluating the above factors the council should consider the following:

- The Owner has not had any previous contraventions of this nature.
- The amount of sediment entering the stream was less than the contribution from the natural scouring of the stream banks from natural events. Mr Hamilton's report

Conclusion 9 and 10 has concluded that the natural sediment regimes for stream 4 and 6 has not been significantly altered by harvesting activities in the Block.

- All of the culverts were installed at about the same time; therefore the contravention has not been repeated or continuous.
- There is no evidence that the Owner deliberately intended to contravene the regulations.
- There is no evidence that the owner intended for road fill or sediment to enter the streams.
- The Owner initially would have received some benefit however the remedial measures taken would have offset any gain.
- The Owner has been cooperative during the investigation; initially by reporting the event to council, in cooperation with the investigator, providing information on the circumstances, and in taking mitigation action.
- The erosion of the soil from the three road crossings will not reduce the productivity of the soil, has not had a detrimental effect on fish habitat, and the increase in water turbidity level is of short term duration.

Remediation Order

If council decides to issue a remediation order under section 27(2) then it should consider that the Owner has already completed some remediation work.

As described above, at crossing C-11 the culvert has been replaced with a new 1000mm metal culvert. The work has been completed to an acceptable standard. The risk of any road fill entering the stream at this location is now extremely low. It is not known whether the Owner has completed mitigation work at the three other crossings, C-1, C-18 and C-27.

The owner also installed an additional four cross-drain culverts, 600m diameter, above that required in the operating plan. The Block was planted in February 2006, except for the felled and bucked area.

APPENDIX 1

Block and Creek Photographs

Block T141 Photographs



Overview of north east side of block.



Overview of south west corner of block showing stream 4 and the replaced crossing C-11.



Overview showing stream 4, the replaced crossing C-11, the old skid road below crossing C-18 and stream 6.



Crossing C-27 on stream 6 with stream reserve above.

Hal Creek Photographs



Origin of slide at high elevation.



Hal Creek slide in natural timber.



Natural occurring slide in the head of Hal Creek, not associated with any logging.



Hal Creek channel through plantation on crown land.

Deer Creek Photographs



Slide through block T172.



Slide above block T172.

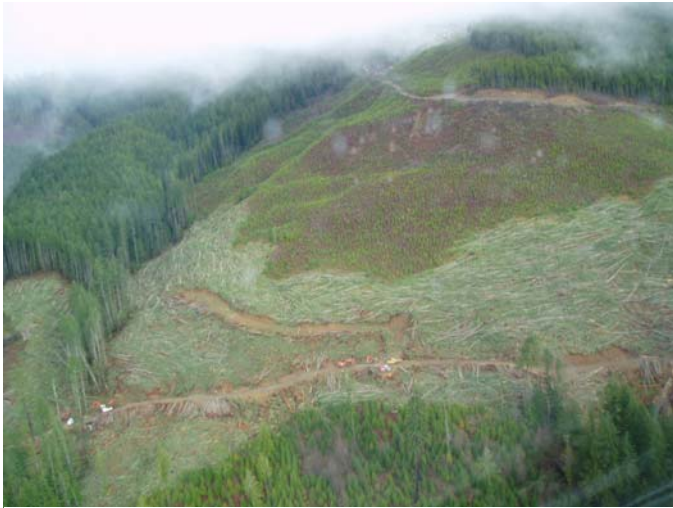


Run out of slide onto block T172.



Slide debris on block T172.

Wolfe Creek Photographs



Harvesting second pass at Wolfe Creek. Area above and below is reforested.



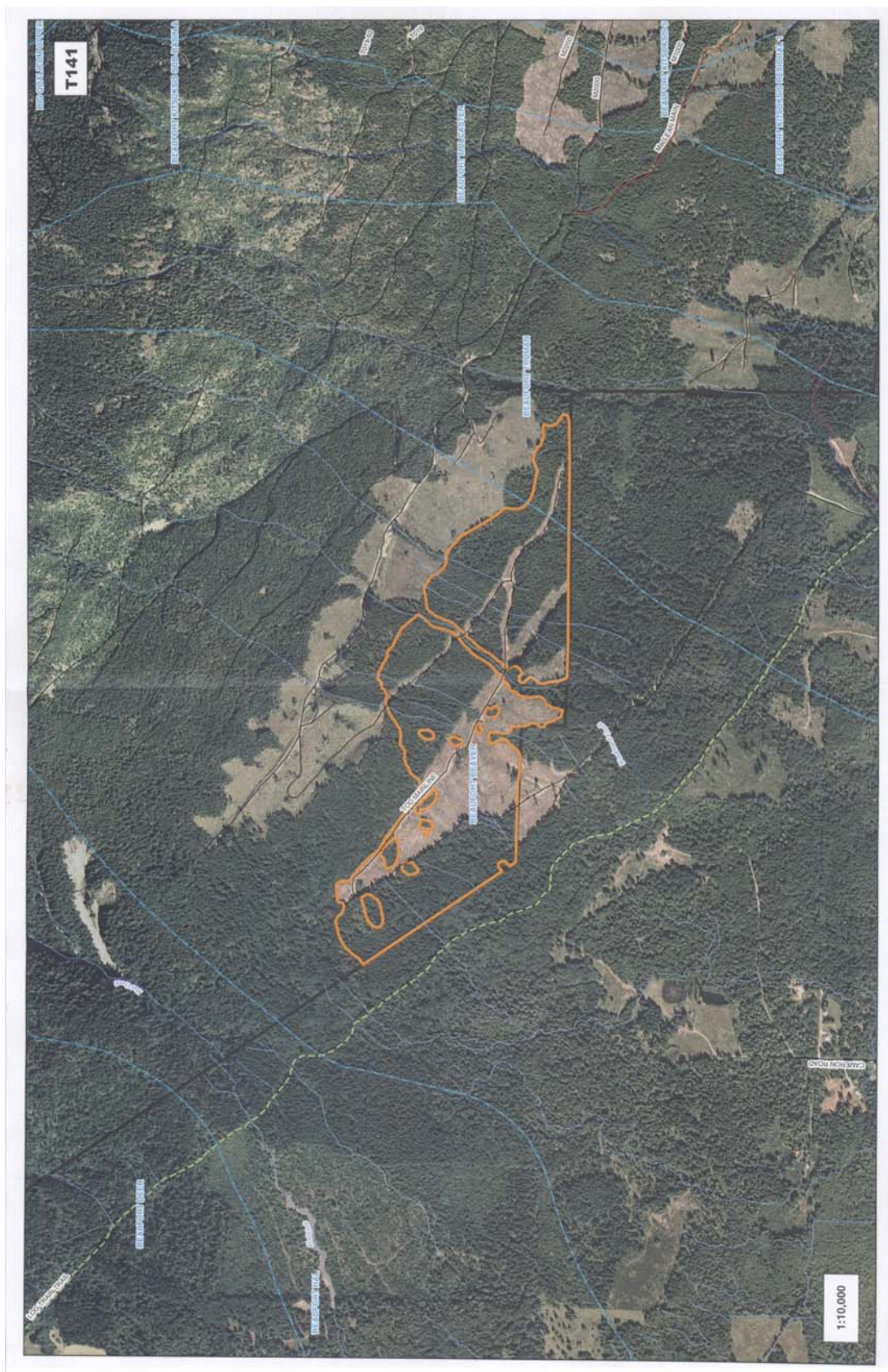
Harvesting in Wolfe Creek area. Stream buffer zones can be observed.



Harvesting pattern in Wolfe Creek area.

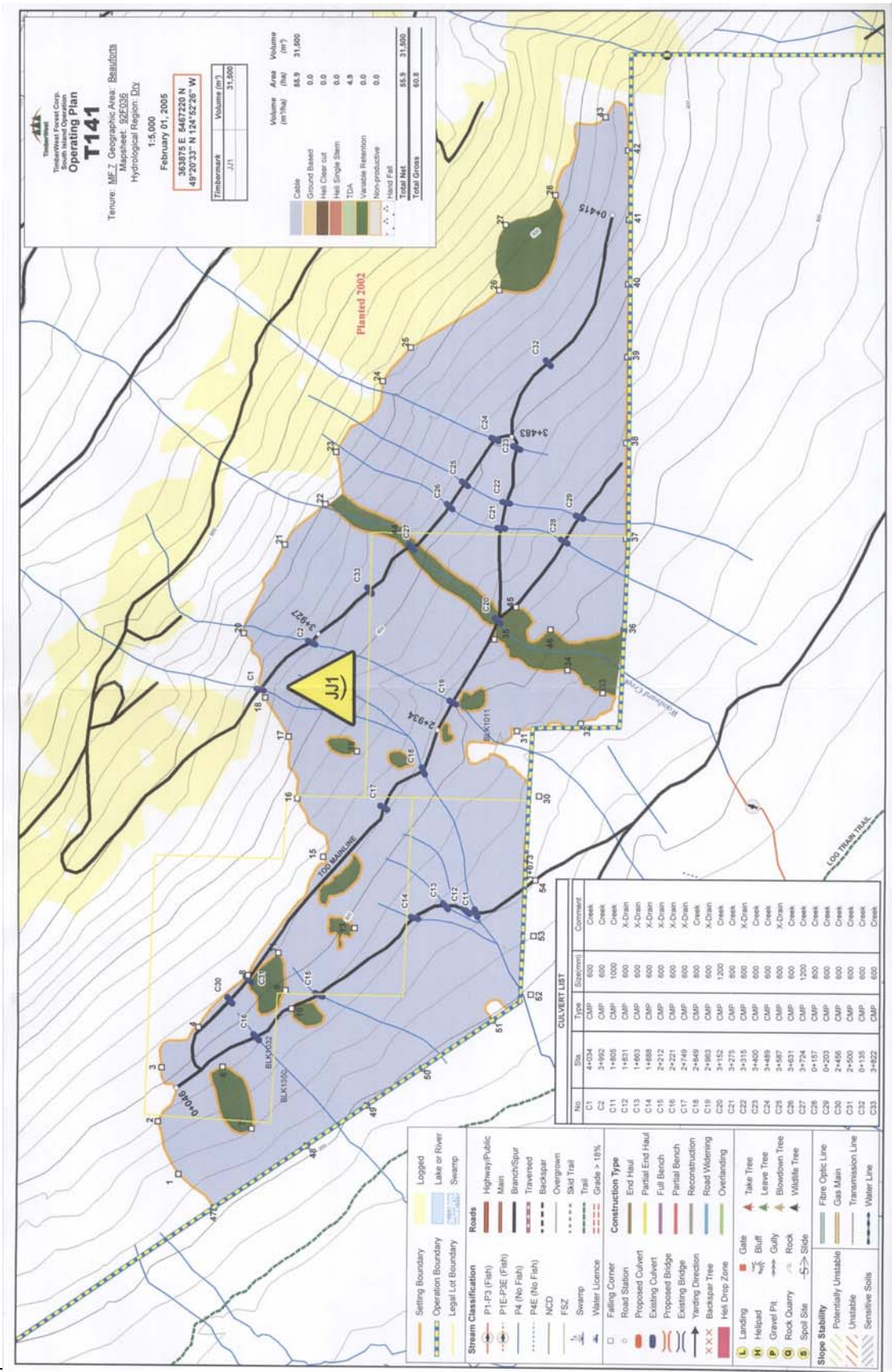
APPENDIX 2

TimberWest Orthophoto Map



APPENDIX 3

TimberWest Operating Plan Map



APPENDIX 4

Culvert Photographs
from Shawn Hamilton and Associates Report

Culvert Photographs



Outlet of culvert C1 (upper culvert) on stream 4.



Outlet of culvert C18 (middle culvert) on stream 4.



Outlet of culvert C11 (lower culvert) on stream 4.



Outlet of culvert C27 on stream 6.

Appendix 5: Operating Plan Progress Map

