
CK106 Block Assessment Kweishun Creek

- TimberWest Forest Corp. -



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Block Assessment of CK106 Kweishun Creek TimberWest Forest Corp.

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1. Executive Summary

Block CK106 is located on Kweishun Creek, a tributary of Rees Creek in the Cruickshank River watershed. The Cruickshank River flows directly into Comox Lake. Block CK106 is approximately 7.9 km (channel distance) upstream of Comox Lake. The Block was inspected on October 1st, 2007 at the request of Mr. Stuart Macpherson, Executive Director of the PMFLC.

The purpose of this inspection was to:

1. characterize the “small lake” within the block, and;
2. provide an opinion if logging adjacent to this “lake” resulted in a potential contravention of Section 17 of the Private Managed Forest Land Council Regulation (Council Regulation).

Block Description

The Block is located in a narrow steep-sided valley on a reach of Kweishun Creek. Naturally occurring slides, rock falls and debris flows have formed a constriction, or “dam”, across the valley at the downstream end of the Block. This “dam” prevents sediment (i.e. sand, gravel, etc.) from being transported downstream by Kweishun Creek during peak flows. Over the years this stream-transported sediment has been deposited upstream of the constriction and a relatively flat area has formed. For the purpose of this report, the portion of this flat area with little, or no woody shrubs, is classified as a meadow.

Kweishun Creek flows into the meadow and becomes multi-channelled. The stream width was measured at six locations and the average channel width was 3.3 m. The stream flows through the meadow and then flows directly into the ground upstream of the “dam”. During high stream flows the amount of water flowing into the meadow area exceeds the amount of water that can flow out of the Block and the meadow becomes flooded. The length of time that the meadow is flooded is unknown but is likely flooded during the fall and spring in a typical year.

Kweishun Creek within the Block meets the Council Matters Regulation definition of a stream since there is a continuous channel bed more than 100m in length, the stream flows seasonally, and there are deposits of mineral alluvium (i.e. sand and gravel) in the channel. Although the section of Kweishun Creek within the Block looks like a small lake for some parts of the year, the flooding is temporary. It is therefore my opinion that Kweishun Creek within the Block is a stream that is temporarily flooded during high flow periods and that it is not a true lake. The “small lake” referred to in Mr. Hunt’s letter to the PMFLC is described as an ephemerally or seasonally flooded meadow in this report.

Fisheries Resource

The Ministry of Environment Fisheries Information Summary System (FISS) states only that Kweishun Creek supports coho salmon, and rainbow and cutthroat trout. Based on existing fish habitat inventory information, it is concluded that there is a barrier to the upstream migration of fish about 600 m downstream of the Block. To my knowledge, TimberWest has not conducted fish sampling in Kweishun Creek in, or upstream of, the Block to determine if resident fish are present above the barrier. TimberWest staff did, however, state that the stream dried up during the summer.

Although it is unlikely that fish are present in Kweishun Creek, it is possible that resident fish are present if there is habitat upstream of the barrier that is wetted all year.

Regulatory Requirements Around Streams

The Private Managed Forest Land Council Regulation (Council Regulation) provides a number of regulations pertaining to streams. Section 17 specifies the constraints on activities in water supply areas and near fish habitat. In summary, Section 17 requires an owner to:

1. retain understory vegetation and non-commercial trees within 5 m of the edge of the stream channel; and
2. ensure that accumulations of woody debris or slash in the stream channels, or physical disturbance to the site, does not result in harm to fish or fish habitat, reduced water quality at water supply installations, or damage to a pond, a wetland, or a seasonally flooded area.

No harvesting was conducted within five meters of the stream channel since trees are not present in this area (meadow). The upstream road crossing was constructed over Kweishun Creek near FC60 but understory and non-commercial vegetation appeared to have been retained as much as possible within five meters of the stream. I saw no evidence of either harm of fish (if present) or fish habitat. There was also no indication that water quality was or will be materially reduced as a result of these activities.

There was numerous accumulation of woody debris in the meadow area, particularly near the constriction (“dam”). Not all of this debris was from harvesting activities since pre-harvest photographs supplied by TimberWest show substantial natural accumulations. Although there are accumulations of small woody debris in the meadow, it is my opinion that this material does not pose a significant risk to downstream water quality. There was no indication that the woody debris was causing, or would cause, accelerated erosion of the stream channel or banks. Some woody debris may be transported to downstream reaches of Kweishun Creek during extreme high water but I do not anticipate that this would cause a measurable decrease in water quality or a negative impact to downstream fish habitat.

A significant portion of Kweishun Creek within the Block was walked and the falling boundary between FC1 and FC2 was inspected. This is the area where large cedar trees were felled into the flooded meadow area of Kweishun Creek. There was no evidence of ground disturbance resulting from falling and yarding other than an isolated area near FC2. The ground disturbance near FC 2 was a shallow depression in an exposed area of gravel (this area is on an alluvial fan) and there was no evidence of soil erosion or the off-site movement of sediment. It is concluded that harvesting activities within the Block did not, or will not, result in significant damage to the seasonally flooded area.

Remediation

Any attempt to remove the accumulation of small woody debris from the meadow area would likely result in a significant amount of ground disturbance. This ground disturbance could result in erosion and the delivery of suspended sediment to Kweishun Creek. Furthermore, it is my opinion that this debris does not pose a significant risk to the downstream fisheries resource. It is therefore recommended that debris removal from the meadow area is not undertaken.

The lower road crossing of Kweishun Creek was constructed by placing about one meter of rock fill on top of the overflow outlet of the meadow. It is therefore recommended that this fill be removed once harvesting activities have been completed in order to restore the natural drainage regime of the Creek. No other remediation is recommended.

2. Introduction

This report summarizes the results of an assessment of harvest block CK106 on Managed Forest Land owned by the TimberWest Forest Corporation. This area will be referred to as the “Block” in this report. Kweishun Creek flows through the Block. Kweishun Creek then flows into Rees Creek which is a tributary to the Cruickshank River. The Cruickshank River flows directly into Comox Lake. The Block is approximately 25 kilometers southwest of the Town of Courtenay on Vancouver Island.

Mr. Stephen Hunt, Director of the United Steelworkers (USW) District 3, sent a letter dated September 25, 2007 to Mr. Trevor Swan, Chair of the Private Managed Forest Land Council (PMFLC). In this letter, Mr. Hunt requests that the PMFLC launch an investigation of logging practices within the Block. Concerns expressed by Mr. Hunt are summarized below:

1. large trees felled into a small lake in the Kweishun watershed;
2. trees landing in lake and touching the bottom of the lake caused siltation to the lake, creek and river; and
3. this siltation caused harm to the lake’s aquatic species.

As a result of this letter, Mr. Stuart Macpherson, Executive Director of the PMFLC requested Shawn Hamilton and Associates to conduct an inspection. The purpose of this inspection was to:

1. characterize the “small lake” described by Mr. Hunt; and
2. provide an opinion if there was a potential contravention of Section 17 of the Private Managed Forest Land Council Regulation (Council Regulation).

I visited the Block on October 1, 2007 with Mr. Stuart Macpherson. Mr. Domenico Iannidinardo, Manager, Integrated Resource Analysis Section, TimberWest; Mr. Dave Lindsay, Fish and Wildlife Specialist, TimberWest; Mr. John Mitchell, Operations Manager, North Island, TimberWest; and Mr. John Dirom, Contract Manager, TimberWest.

3. Block Layout and General Site Description

The Block is located in a narrow steep-sided valley on a reach of Kweishun Creek that flows in a northerly direction. The Block is in Managed Forest 65 and the Block area is 18 ha (Figure 1). Harvesting occurred during 2006. Kweishun Creek flows through the center of the Block and then flows in a north-easterly direction for about 1.6 km where it flows into Rees Creek. Rees Creek flows in an easterly direction for about 2.1 km to the Cruickshank River. The Cruickshank River flows directly into Comox Lake approximately 4.2 km (river distance) to the east.

Comox Lake and tributaries to Comox Lake, including Kweishun Creek, are in a Community Watershed (Water Supply Area). This means that Kweishun Creek must be managed as a stream in a Water Supply Area as specified in the 2004 Council Regulation. Streams in a Water Supply Area must be managed as a fish-bearing stream even though fish may not be present.

Figure 1 CK106 Block Map. Red arrows indicate stream location and direction of flow. The meadow area is circled in red. Location of the upper stream crossing is indicated with a bright green arrow. The bright blue arrow shows the lower road crossing at the alluvial constriction. The dark blue arrow is at the approximate location of the upstream limit of fish use and the dark blue dot shows where the stream goes sub-surface in the meadow.

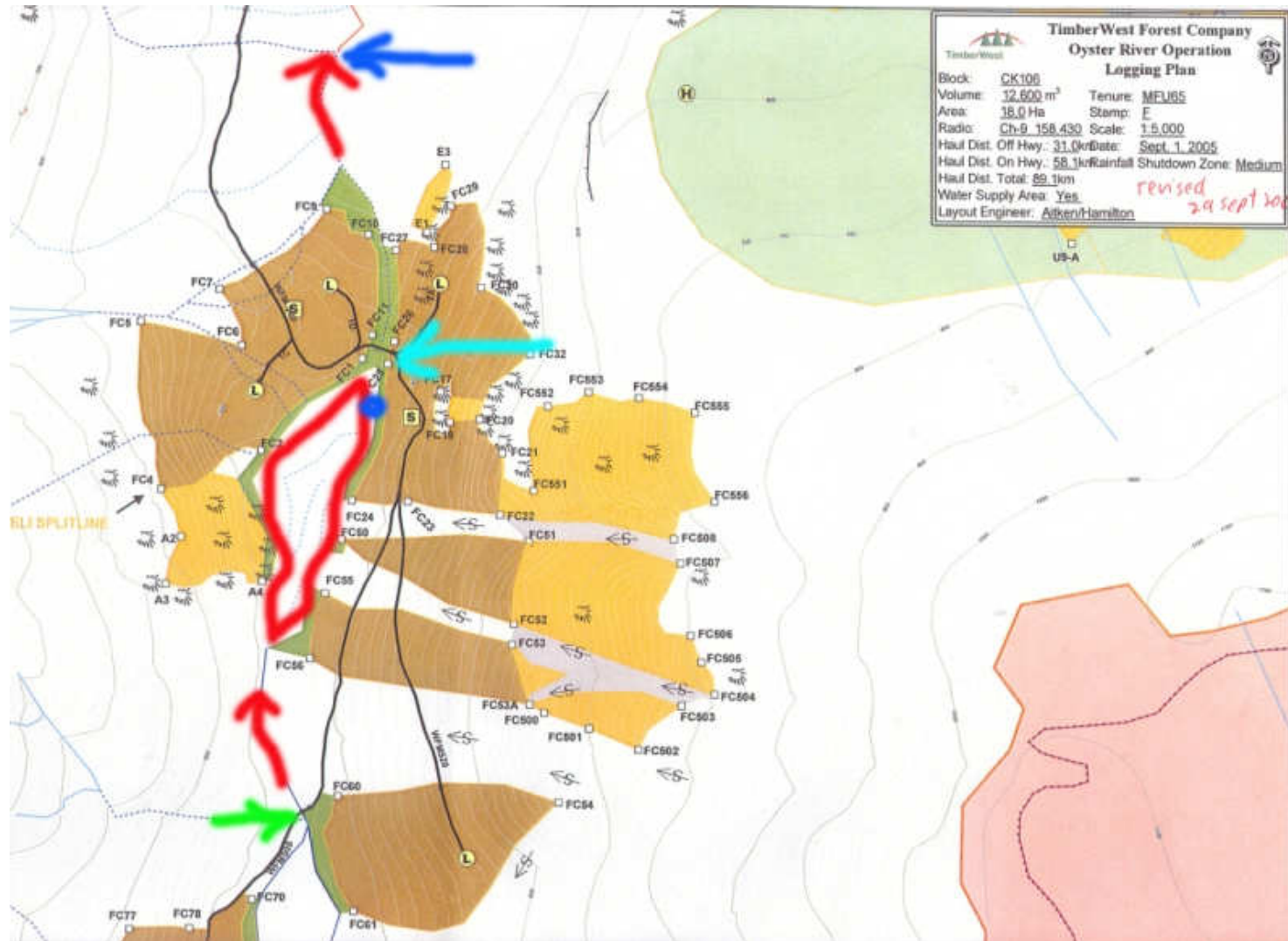




Photo 1 Looking downstream at the colluvial constriction, or dam, on Kweishun Creek. During extreme high flows, the Creek flows over this deposit where the truck is parked and then down to Rees Creek.

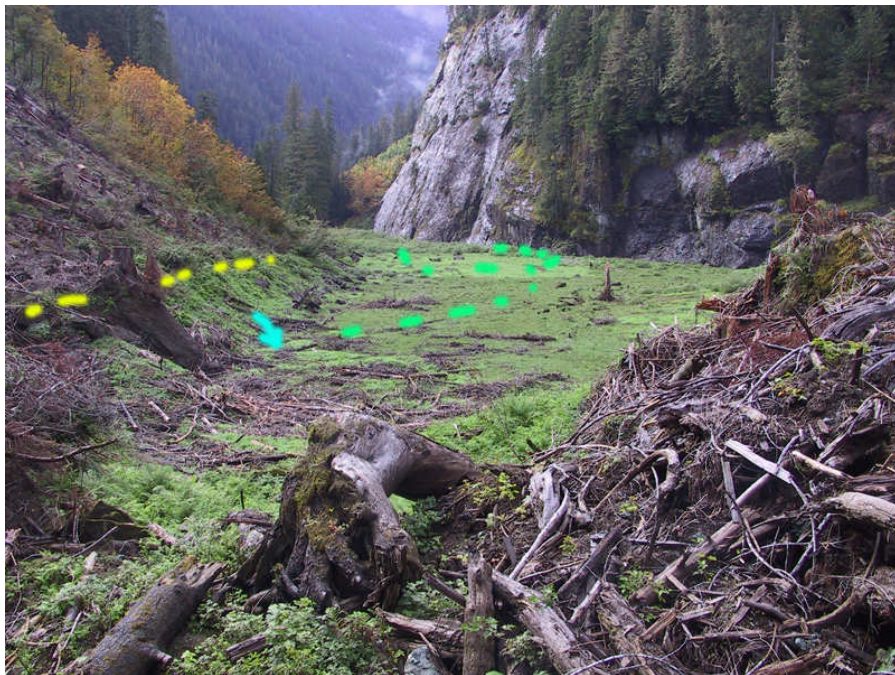


Photo 2 Looking upstream at Kweishun Creek from colluvial constriction. The green dashed line shows the approximate location of the stream channel. The blue arrow indicates where the stream goes sub-surface. The yellow dashed line indicates the approximate high water mark.

Naturally occurring slides, rock falls (colluvium), and debris flows (Photo 1) have formed a constriction, or “dam”, across the valley near FC 1 and FC 25 (Figure 1). This “dam” prevents alluvial (sediment moved and deposited by flowing water) sediment (i.e. sand, gravel, etc.) from being transported downstream by Kweishun Creek during peak flows. Over the years this sediment has been deposited upstream of the constriction and a relatively flat area of deposited sediment comprised mainly of gravel and sand has formed (Photo 2).

This flat area extends between the road crossing near FC 60 at the upstream end down to the constriction at FC 25. The flat area is vegetated with woody shrubs (willow), as well as herbaceous shrubs including fireweed (*Epilobium augustifolium*) and Sitka burnet (*Sanguisorba canadensis*), rushes, etc. For the purpose of this report, the portion of the flat area with little, or no woody shrubs is classified as a meadow.

Kweishun Creek flows into the meadow and becomes multi-channelled (Photo 3). The stream width was measured at six locations near FC55 to determine average channel width. The average channel width was 3.3 m. The stream flows through the meadow towards the colluvial constriction and then flows directly into the ground at a location south of FC 25 (Photos 2 and 4).

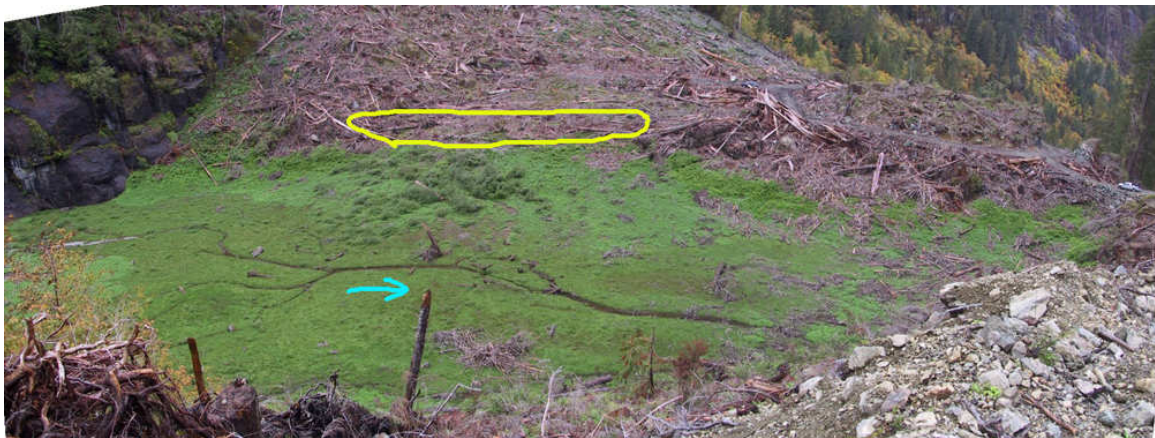


Photo 3 Kweishun meadow that is subject to periodic flooding. Blue arrow shows the direction of stream flow. Approximate location where cedar trees were felled into water circled in yellow between FC1 and FC2.

During high stream flows, however, the volume of water flowing into the meadow area exceeds the volume of water that can flow through the colluvium and the meadow becomes flooded. The length of time that the meadow is flooded is not exactly known. TimberWest employees have indicated that the meadow could be flooded for one or more months during the fall and then again in the spring when stream flows are highest.

4. Fisheries Resource

No fish sampling was conducted during the October 1, 2007 site assessment and no fish were observed. A fish inventory was conducted in Kweishun Creek downstream of the Block by D Tripp Biological Consultants Ltd. (1995). This work was done for TimberWest. The Tripp inventory report describes fish sampling that was conducted in Kweishun Creek approximately one kilometre below the Block and identifies a barrier to upstream fish movement at about 800 m upstream of the confluence with Rees Creek (approximately 600 m downstream of the Block). Coho salmon fry,

cutthroat trout and Dolly Varden char were observed downstream of the barrier (Tripp, 1995). Based on the Tripp inventory it is concluded that there is a barrier to the upstream migration of fish about 600 m downstream of the Block.



Photo 4 Location in the meadow where Kweishun Creek flows into the ground. This site is shown in Photo 2 with a blue arrow.

To my knowledge, TimberWest has not conducted fish sampling in Kweishun Creek in, or upstream, of the Block to determine if resident fish are present in the Block. TimberWest staff did, however, state that the stream dried up during the summer. Although it is unlikely that fish are present in Kweishun Creek, it is possible that resident fish could be present if there is perennially wetted habitat upstream of the barrier.

The Ministry of Environment Fisheries Information Summary System (FISS) contains very little information for Kweishun Creek (Watershed Code 920-553200-94200-50600-2680-2290). The database states only that the watershed supports coho salmon, and rainbow and cutthroat trout. Although not inspected, I suspect that fish habitat in the steeper portion of Kweishun Creek is marginal and the lower gradient stream reaches would contain habitat that is either moderately or highly productive.

5. Stream/Lake Classification within the Block

A stream is defined in the 2004 Private Managed Forest Land Council Matters Regulation (Council Matters Regulation) as:

- “**stream**” means a watercourse, including a watercourse that is obscured by overhanging or bridging vegetation or soil mats, that contains water on a perennial or seasonal basis, is scoured by water or contains observable deposits of mineral alluvium, and
- a. has a continuous channel bed that is 100 m or more in length, or

-
- b. flows directly into
 - i. a fish stream or a fish-bearing lake or wetland, or
 - ii. a licensed waterworks.

There is no definition of a lake in any of the Private Managed Forest Land Regulations, nor are there any regulations governing forest harvesting activities adjacent to lakes. However, lakes and wetlands are defined by British Columbia's Resources Information Standards Committee¹ (RISC). The RISC definition of a lake is "an open waterbody with a depth greater than two meters and with less than 25% of its surface area covered with wetland vegetation". A wetland is defined as "an area where the water table is at, near, or above the surface, or where soils are water saturated for a sufficient time so that the principle determinants of vegetation and soil development are excess water and low oxygen".

Kweishun Creek within the Block meets the Council Matters Regulation definition of a stream since there is a continuous channel bed more than 100 m in length, the stream flows seasonally, and there are deposits of mineral alluvium in the channel.

Although the section of Kweishun Creek within the Block looks like a small lake for some parts of the year, the flooding is temporary. It could be argued that once the water depth in the flooded portion of the stream exceeds two meters it technically becomes a lake. However, it is my understanding that the RISC definitions were intended to be applied to permanent features and that there will always be some circumstances that do not neatly fit into a simple definition (this is based on discussions with Provincial staff).

It is therefore my opinion that Kweishun Creek within the Block is a stream that is temporarily flooded during high flow periods and that it is not a true lake. The area adjacent to the stream that is flooded is best described as an ephemerally or seasonally flooded meadow². The stream itself is the approximately 3.3 m wide channel that has been scoured in the meadow by flowing water (located at green dotted line in photo 2). The annual high water mark, or edge of trees shown with a dotted yellow line in photo 2, delineates the extent of the floodplain and this is not considered the edge of the stream channel.

6. Regulatory Requirements Around Streams

The Private Managed Forest Land Council Regulation (Council Regulation) provides a number of regulations pertaining to streams. Section 17 specifies the constraints on activities in water supply areas and near fish habitat. Kweishun Creek is within a Water Supply Area.

¹ RISC is responsible for establishing Provincial standards for natural and cultural resources inventories.

² Even if the meadow was defined as a wetland, the same Regulations would apply.

6.1. Constraints on activities in water supply areas and near fish habitat (Council Regulation Section 17)

Section 17 of the Council Regulation states that:

- 1) An owner who, adjacent to a stream, carries out timber harvesting or related activities, silviculture activities or road construction or deactivation activities must ensure that those activities meet all the following requirements:
 - a. understory vegetation and non-commercial trees within 5 m of the edge of the stream channel are retained to the fullest extent possible unless the disturbance of the understory vegetation and non-commercial trees would not result in
 - i. harm to fish or fish habitat, or
 - ii. reduced water quality at water supply installations;
 - b. accumulations of woody debris or slash in the stream channels do not result in
 - i. harm to fish or fish habitat, or
 - ii. reduced water quality at water supply installations.
- 2) An owner who carries out timber harvesting or silviculture activities on an area must ensure that accumulations of woody debris on the site, or physical disturbance to the site, do not result in damage to
 - a. a pond,
 - b. a wetland, or
 - c. a seasonally flooded depression that is seasonally or permanently occupied by one or more of the species of fish referred to in the definition of “fish stream” in section 1 of the Private Managed Forest Land Council Matters Regulation.

7. Discussion and Conclusions

7.1. Retention of understory vegetation and non-commercial trees within 5 m of the edge of the stream channel (Section 17.1.a)

No harvesting was conducted within five meters of the stream channel since trees are not present in this area. The upstream road crossing was constructed over Kweishun Creek near FC60 (Photo 5) but understory and non-commercial vegetation appeared to have been retained as much as possible within five meters of the stream. I saw no evidence of either harm of fish (if present) or fish habitat. There was also no indication that water quality was or will be materially reduced as a result of these activities.

7.2. Accumulations of Woody Debris or Slash

There was numerous accumulation of woody debris in the meadow area, particularly near the alluvial constriction (Photo 6). Not all of this debris was from harvesting activities since pre-harvest photographs supplied by TimberWest show substantial natural accumulations. Although there is a substantial volume of small woody debris, it is my opinion that this material does not pose a significant risk to downstream water quality.

There was no indication that the woody debris was causing, or would cause, accelerated erosion of the stream channel or banks. Some woody debris may be transported to downstream reaches of Kweishun Creek during extreme high water but I do not anticipate that this would cause a measurable decrease in water quality or a negative impact to downstream fish habitat.



Photo 5 Looking at the upper road crossing of Kweishun Creek (channel location marked with blue arrows).

7.3. Impacts to Pond, Wetland, or Seasonally Flooded Depression.

Section 17 states that an Owner must not damage a pond, wetland, or seasonally flooded depression with accumulations of woody debris or by physical disturbance. A significant portion of Kweishun Creek within the Block was walked and the falling boundary between FC1 and FC2 was inspected. This is the area where large cedar trees were felled into the flooded meadow area of Kweishun Creek.



Photo 6 Accumulations of woody debris in the meadow area.

There was no evidence of ground disturbance resulting from falling and yarding other than an isolated area near FC2 (Photo 7). The ground disturbance near FC 2 was a shallow depression in an exposed area of gravel (this area is on an alluvial fan) and there was no evidence of soil erosion or the off-site movement of sediment. As stated in Section 7.2, the accumulations of woody debris also did not, in my opinion, constitute damage to the seasonally flooded area.



Photo 7 Area of exposed gravel between FC1 and FC2. No indication of sediment delivery to Kweishun Creek. Photo supplied by TimberWest.

7.4. Remediation

Any attempt to remove the accumulation of small woody debris from the meadow area would likely result in a significant amount of ground disturbance if done by machine. This ground disturbance could result in erosion and the delivery of suspended sediment to Kweishun Creek. Furthermore, it is my opinion that this debris does not pose a significant risk to the downstream fisheries resource. It is therefore recommended that debris removal from the meadow area is not undertaken.

The lower road crossing (engineered ford) of Kweishun Creek (Photo 1) was constructed by placing about one meter of rock fill on top of the overflow outlet area. It is therefore recommended that this fill be removed once harvesting activities have been completed in order to restore the natural drainage regime of the Creek. No other remediation is recommended.

8. Statement of Limitations

This report was prepared for the Private Managed Forest Land Council. The material in this report reflects Shawn Hamilton and Associates' best judgment in light of the information available to us at the time of preparing this report. Conclusions and recommendations in this report are based on an analysis of the best available information and professional judgement that is subject to a degree of scientific uncertainty, and therefore cannot be used as absolute fact. Shawn Hamilton and Associates has made the findings and conclusions set out in this report in a manner consistent with the level of care and skill normally exercised by members of the environmental science profession practicing under similar conditions at the time the work was performed.

The report author believes this report to be accurate. However, he cannot guarantee the completeness or accuracy of information supplied to him. Any use which a third party, other than the parties mentioned above, makes of this report, or any reliance on, or decisions to be made based on it, are the responsibility of such third parties. The author accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken.

