



PRIVATE  
MANAGED  
FOREST LAND  
COUNCIL

**Private Managed Forest Land Program  
Audit Report 2005**

## **Acknowledgements**

Bob Kopp, RPF and Shawn Hamilton, RPBio who were retained by the Private Managed Forest Land Council for the 2005 audit program completed this report. The auditors thank the participating landowners and their representatives for their cooperation during the field audit visits and in providing information needed for the evaluation. Their assistance facilitated completion of the audit on schedule.

## Executive Summary

In the summer of 2005, the Private Forest Land Council commissioned an audit of the Private Forest Land Program. Twelve private managed forest land properties were selected. A combination of large, mid-size and small properties on Vancouver Island/Sunshine Coast and the West Kootenay were selected. The audit was conducted between July 18 and September 16, 2005. The purpose of the audit was to assess compliance of forest practices with the Private Managed Forest Land legislation and to assess the effectiveness of the legislation in protecting key environmental values.

The *Private Managed Forest Land Act* establishes objectives for the key public environmental values, which are fish habitat, water quality, critical wildlife habitat, soil conservation, and reforestation. The minimum standards of practice for the protection of these key values are set out in related regulations.

This audit report presents the findings of the auditors and a description of the objectives, scope and methodology used.

The audit examined operational activities and obligations in the areas of harvesting, road construction, maintenance and deactivation, and reforestation for the period August 3, 2004 up to the day of each field audit. These activities were assessed for compliance with the Private Forest Land Council Regulation requirements for fish habitat, water quality, forest soils and reforestation.

The audit process involved on-site meetings with each selected owner. The owners were interviewed during the audit on issues specific to each field site and the management activity on their lands. For each property, audit findings were developed from an evaluation of information collected through interviews, map and document reviews and site-specific field observations, measurements and tree counts.

The audit findings for compliance and effectiveness were derived from an evaluation of the sites and activities audited, and the findings are presented separately for each of the key environmental values.

The auditors found that the forest management practices evaluated in the Managed Forests audited comply with the practice requirements of the Private Managed Forest Land Council Regulation for soil conservation, reforestation, water quality and fish habitat. Additionally, the auditors found that the harvesting, road construction/maintenance, and reforestation practices on all properties carrying out these activities during the audit period were effective in meeting the requirements.

The owners are implementing the legislation effectively. Operational practices on all properties are consistent with the intent of the legislation, and operations are protecting key environmental values. Overall, reforestation is being completed, there is conservation of the growing capacity of the soil and there are appropriate measures in place to protect fish, fish habitat and water quality. It is evident the owners are managing their land for growing timber and are protecting key environmental values.

The owners were found to have planning, implementation and monitoring systems in place to ensure compliance and effectiveness in meeting regulatory requirements. The level of detail in the plans tends to be guided by the size of the ownership, and the requirement for environmental protection based on risk management.

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### 1.0 Introduction

#### Mandate and Legislation

The Private Managed Forest Land Council (the Council) was established by the provincial government in 2004 as the agency responsible for administration of the private managed forest land program. Applicable legislation includes the *Private Managed Forest Land Act* (the Act); the Private Managed Forest Land Council Regulation; and the Private Managed Forest Land Regulation. The object of the Council is to encourage forest management on private managed forest land, taking into account the social, environmental and economic benefits of those practices.

The Act establishes objectives for the key public environmental values, which are fish habitat, water quality, critical wildlife habitat, soil conservation, and reforestation. The Private Managed Forest Land Council Regulation sets minimum standards of practice for the protection of water quality and fish habitat, soil conservation and reforestation. Additionally, provision is made in the Private Managed Forest Land Regulation for the wildlife minister to designate land as critical for the survival of one or more species at risk.

The legislation provides the Council with powers to set, monitor, investigate and enforce forest practice standards for land assessed under the *Assessment Act* as managed forest (MF). The Council conducts forest practices audits with respect to the legislated standards and requirements as part of their administrative role.

#### 2005 Audit

In July 2005 the Council engaged two independent consultants to form the audit team for the 2005 audit of 12 MF properties selected by the Council. The selected properties covered a sample of large, medium and small properties. The sample included eight active properties and four properties with no operations reported in their 2004 annual declaration. The intent was to assess owner compliance with the legislation and the effectiveness of these requirements in meeting objectives set in the legislation for key environmental values.

The forest practices audit took place in the summer of 2005. Seven properties in the Vancouver Island/Sunshine Coast region were audited between July 18 and August 15, and five properties in the West Kootenay region were audited between September 12 and 16.

This audit report presents the findings and a description of the objectives, scope and methodology used for the audit.

#### Audit Team

Bob Kopp – lead auditor. Mr. Kopp is a registered professional forester with over 33 years of experience in forest management planning and operations. He has undertaken forestry audits since 1998, and he has completed 18 environmental audits with the BC Forest Practices Board. His training and audit experience has encompassed environmental management systems, forestry certification standards and regulatory compliance. In addition to his experience in planning and conducting forestry audits, Mr. Kopp is able to provide expertise in the areas of silviculture, harvesting and forest engineering.

Shawn Hamilton – auditor. Mr. Hamilton is a registered professional biologist with over 30 years experience working in the field of fisheries/forestry interactions. From 1974 to 1992 Mr. Hamilton was employed by the Department of Fisheries and Oceans, and was Senior Fisheries/Forestry Interaction Biologist for the Pacific and Yukon Region in 1992. He has worked as a consultant serving government and private sector clients on fisheries/forestry issues since 1993. He has conducted numerous watershed assessment studies. His experience includes compliance auditing, investigations of contraventions and development of forest harvesting guidelines.

## Observers

The landowners and/or their representatives for each MF accompanied the audit team and witnessed the audit process. Rod Bealing, forestry manager for the Private Forest Landowners Association (PFLA) attended as an observer on eight of the 12 field audits. Mr. Bealing's responsibility as the PFLA forestry manager is to provide landowners support concerning regulatory issues, best management practices and forestry education and training for their members.

## 2.0 Objectives

The purpose of the audit was to assess both compliance of forest practices with the private managed forest legislation and the effectiveness of the legislation.

The audit objectives were to:

- Determine the degree to which forest practices on MF lands comply with the *Private Managed Forest Land Act* and the associated regulations (the legislation);
- Evaluate effectiveness of the legislation on MF lands;
- Evaluate approaches to planning and treatment execution in respect to obligations and requirements;
- Identify notable practices being implemented voluntarily.

## 3.0 Scope

The audit examined field activities and obligations in the areas of harvesting, road construction, maintenance and deactivation, and reforestation. These activities were assessed for compliance with the legislation practice requirements for the key environmental values. All activities and obligations for the period August 3, 2004 up to the day of each field audit visit were included in the scope of the audit.

## Properties

All properties audited are managed forests. The 12 MF properties are:

MF #	Owner	Location	MF Area (hectares)	Harvest in Audit Period
<b>Coast</b>				
7, 8, 65, 68	TimberWest Oyster River Operation	Campbell River	119,622	Yes
360	AJB Investments Ltd	Sechelt	1,357	Yes
22	Merrill & Ring Inc.	Campbell River	943	Yes
91	R.B. Gregson	Duncan	66	Yes
114	Green Fiord Lands Ltd.	Yellow Point	38	Yes
192	James Kinghorn	Victoria	93	No
221	Robert McMinn	Victoria	138	No
<b>Interior</b>				
40	Pluto Darkwoods Corporation	Nelson	56,565	Yes
53	Kelly Creek Timber Co. Ltd	Salmo	5,933	Yes
54	Wynndel Box and Lumber Co. Ltd.	Creston	9,505	Yes
170	Aspa Industries Ltd	Salmo	649	No
348	Ralph Moore	Creston	22	No

The TimberWest Oyster River Operation is responsible for activities on four separate MF properties, however the audit assessed the Operation as a single unit.

Each audited MF property has unique conditions and other factors that include difficulty of access, physical features and local climate among other issues specific to an ownership. There are also varying management approaches and reasons for ownership.

Six of the coastal properties are located on the east coast of Vancouver Island extending south from Campbell River to the Highlands District north of Victoria. One property is situated near Sechelt on the Sunshine Coast. Warm dry summers and mild wet winters are common at the low elevations in the region. TimberWest's properties extend over a large section of Vancouver Island that includes high elevation sites where winters are colder and longer. Fish streams are most abundant at lower elevations in the region. The varied terrain and climate support a range of commercial tree species including Douglas fir, western hemlock, western red cedar, balsam and white pine.

The Interior properties are all situated in the West Kootenay region of southeastern British Columbia and are located south of Nelson. Much of the land in this region consists of steep, rugged terrain dominated by mountains, narrow valleys and well-defined drainages. Fish are common in the low elevation streams of the region. MF 348 is located on the outskirts of Creston. All the other MF properties audited are located west of Kootenay Lake within the Interior Cedar-Hemlock and Engelmann Spruce-Subalpine Fir ecological zones. At low elevations in this region, summers are often hot and dry, but a slow melting snow pack helps keep soil moisture high in the summer. Snow conditions at higher elevations prevail for five to seven months each year. The climatic conditions are favourable for tree growth and produce stands of cedar, hemlock, spruce and balsam along with Douglas fir and lodgepole pine. The recent spread of mountain pine beetle into the region is a forest health concern to owners with susceptible pine stands.

### **Audit Process**

The Council notified each MF owner whose property was selected for the audit. Following the notification, the lead auditor contacted each owner to schedule the field assessment, assemble information and request a completed audit questionnaire. The completed questionnaires, copies of owner's management commitments and the most recent annual declarations provided the basis for preparing the audit plan.

An opening meeting involving the audit team, owners or their representatives and observers was held at the outset of the field visit to each property. The purpose of the audit and the process to be followed was explained. Each owner was given an opportunity to ask questions and inform the audit team of the management strategies and relevant background information about the property. The field sample was then finalized based on the level of activity at each property.

The owners were interviewed on issues specific to each field site and the management activity being sampled. For each property, audit findings were developed from an evaluation of information collected through interviews, map and document reviews and field observations, measurements and tree counts. Information assembled for each sample included checklists, site-specific maps, field notes, working papers, and photographs. These were all filed in an audit evidence binder.

Informal closing meetings were held on site with each owner upon completion of the field assessment phase. The auditors provided verbal feedback regarding the results of the assessment.

### **Audit Sample**

The audit examined a sample of harvesting, newly constructed roads and reforestation activities. The current road maintenance and deactivation status was also examined, as well as the restocking and regeneration status on sites where the timber was either previously harvested or destroyed by natural causes.

For the four properties with low levels of activity, all the sites with activity were selected for audit. For the three properties with higher levels of activity, samples were selected to obtain geographic coverage and to sample harvesting and road construction with, or in close proximity to riparian features. Four

properties had no activities reported during the audit period. Field assessment of these properties focused on general environmental and forest condition as well as resource features such as fish streams and access roads.

All field assessments were completed using on site observation, ground measurements and tree counts. Sites were accessed by road and no aerial observations were undertaken.

The number of samples audited by activity is:

- 39 harvest blocks (ground and cable systems)
- 10.2 kilometers of new road construction
- 308 kilometers of road maintenance and 3 maintained bridges
- 23 reforestation areas

### 4.0 Findings

The audit findings were developed from an evaluation of evidence collected through interviews, map and document reviews, field observations, measurements and tree counts.

The findings were derived from the sample of the activities audited. They reflect the audit team's assessment of the MFs evaluated and as such these findings do not necessarily represent forest practices on other MFs.

The findings presented are for all the properties sampled apart from where exceptions are noted.

For properties with activities during the audit period, the auditors evaluated to what degree the legislation is effective in protecting key public values. The four properties that had no activity reported were assessed to verify that no activity had occurred.

This report provides a qualitative opinion on the outcome of the audited forest practices. The findings for compliance and for effectiveness are presented separately for each of the key public values below.

### 4.1 Soil Conservation

#### Compliance

The auditors found forest management practices at all properties comply with the objective and practice requirements for soil conservation.

#### Effectiveness

Overall, the operations assessed were effective in protecting soil productivity and minimizing erosion and the likelihood of landslides. The amount of area occupied by access structures i.e. roads, pullouts, turnarounds, landings has been limited to levels necessary to safely and efficiently conduct harvesting. Road access to harvest areas is by branching off of existing road systems. Additionally, both new and existing roads are stable with surfaces generally less than 4.5 metres wide.

All of the owners have considerable local knowledge and operational experience with their properties. The owners' general approach to access development is to configure roads to suit the specific ground conditions, terrain and other factors such as the intended harvest method and equipment.

Road construction methods vary only slightly between the geographic regions even given differences in topography, climate and other factors. Common use was made of rolling grades, out-sloping of road surfaces, ditches and cross-drain culverts, sediment catches, vegetative seeding, road surface capping and other techniques to stabilize road structures and minimize erosion.

Most harvest operations used ground-based methods, but cable and helicopter systems are being used in steeper terrain. The harvest methods and logging equipment being used are appropriate for all the harvest areas assessed. While soil conditions and topography varied significantly within and between



properties, harvesting is being conducted with minimal effect on soil productivity at all properties. The number and size of landings and trails are being limited to a necessary level. Designated skid trails and low ground pressure machinery are being used to minimize soil disturbance and compaction, and there is no history of chronic terrain instability on the properties inspected.



**Active logging site near Salmo**



**Main access road to MF near Salmo**



**Excavator building a new road near Nelson**



**Stable, well built road near Sechelt**

## 4.2 Water Quality and Fish Habitat

### Compliance

The auditors found forest management practices at all properties comply with the objectives and practice requirements for water quality and fish habitat.

### Effectiveness

Overall, the operations assessed were effective in protecting water quality. Sufficient streamside trees are being retained to maintain channel structure and to minimize sediment transport into streams. Natural drainage patterns have been maintained, and operational activities have had minimal effect on stream channels and water quality. Although there is some variation in practices, the general approach has been to voluntarily avoid operating in close proximity to fish streams and water intakes where possible. Where operations occurred near streams, the owners have retained more than the required numbers and sizes of trees and other vegetation to meet their regulatory obligations.

Eleven of the twelve audited properties have fish habitat and/or water supply intakes within or downstream of their land. The Council has not received complaints of water quality problems from downstream water users during the audit period. No harvesting or road construction took place in close proximity (less than 100 meters) to any water supply intakes. All the owners and their representatives are well informed of both licensed and unlicensed water intakes on or downstream of their properties. Four owners of MF property within a water supply area have these areas identified on their maps, and these owners are all aware of local water supply interests.

The auditors noted that portions of some streamside tree retention areas were subject to wind damage after adjacent trees were harvested. Generally, only individual trees or small groups of trees were blowdown and they did not have a significant effect on water quality or fish habitat. However at one site, some channel disturbance resulted from uprooted trees along the stream bank. The channel disturbance resulted in minor sediment delivery to the stream. However, the amount of sediment was small and auditors judged that the windthrow had no material effect on water quality or habitat. This is not a finding of non-compliance because adequate numbers and sizes of trees had been retained. Since windthrow is a natural process and no sites are immune from storm winds, MF owners need to consider the potential effects of wind damage carefully.

Road systems on properties with recent harvest activity were being maintained to conditions that are appropriate for the level of use. The road systems on these properties were generally well maintained, and road prisms are stable. Access roads were commonly deactivated to a level that controls runoff when not in use.

Roads on properties with no recent activity have not been maintained to standards for use by logging trucks. However, they are environmentally stable and are being maintained to a two- or four-wheel drive level.



**Shawn Hamilton inspecting a corrugated metal stream culvert at coastal site**



**Next Creek is a fish stream near Creston**



**Stream channel unaffected by recent nearby logging at coastal site**

### 4.3 Critical Wildlife Habitat

The Private Managed Forest Land Regulation makes provision for the wildlife minister to establish an area on MF property as critical wildlife habitat for the survival of one or more species at risk. The intent of the legislation is to provide for critical habitat on MF land only in circumstances where insufficient habitat is available on Crown lands.

The wildlife minister has not identified any area within the MF properties as critical wildlife habitat. However the owners are aware of this potential regulatory requirement and process to protect critical wildlife.

Some of the properties provide habitat for a variety of general wildlife species. While circumstances and practices vary, the auditors found that the owners are aware of general wildlife values on their properties and take measures to maintain specific wildlife habitat. For example, at one harvest site the owner designed harvest boundaries and managed activities to protect a goshawk nest that had been identified. Another owner has participated in 12 wildlife research studies since 1989. These field research projects included nine studies of grizzly bear and one study each of cougar, wolf and mountain caribou.

### 4.4 Reforestation

#### Compliance

The auditors found reforested sites to be well established. They are growing free of brush competition and stocking exceeds the regulatory requirements.

There is no backlog of land to reforest on any of the properties evaluated. On those properties that have only had small scale selective harvesting in the past 15 years, the areas are well stocked with trees of mixed species, ages and sizes.

#### Effectiveness

The auditors found a range of reforestation treatments i.e. site preparation, planting and stand tending practices were being used. Overall, these practices were effective in reforesting harvested areas. Harvested sites at all properties are being promptly reforested with healthy, commercially valuable trees. The regeneration at the sites assessed was well established and not impeded by competition from other plants or shrubs

All of the owners have demonstrated a sound technical understanding of the reforestation regimes that are most suitable for the type of sites on their properties. The general approach to reforestation is to plant harvested areas with 1000 to 1700 healthy seedlings per hectare and carry out fill- planting and brush treatments where necessary. It is evident that more seedlings than the required minimums of 400 and 600 per hectare are being planted, and that most areas are restocked within two years after harvesting. Also seedling survival and growth is being monitored, and where necessary, seedlings are being protected from deer and elk browsing. These practices ensure the owners have a high likelihood of meeting restocking and regeneration obligations.



Well-established regeneration near Campbell River



Planted seedling near Salmo



Mixed conifer stands at various rotational stages near Nelson

## 4.5 General Effectiveness

The PMFL legislation is results-based, and allows MF landowners flexibility in forest management practices. While the audit did not focus on the owner's internal systems or controls, it is evident that owners must ensure that their internal processes continue to assure compliance with the legislation and produce effective results. One owner has an internal system of controls for environmental management that is certified to the international ISO EMS 14001 standard, while another owner applies this standard voluntarily to its MF. The other owners use a variety of management techniques to ensure their forest practices are satisfactory, and rely on the competence of their professional staff and contractors. The auditors found that the harvesting, road construction/maintenance, and reforestation practices for all properties with these activities were effective in meeting the legislation requirements.

It is noteworthy that six of the eight active properties employ professional staff for planning and regular oversight of operations. All of the owners have considerable experience and knowledge in managing their properties.

With the exception of MF 360, all the properties audited have been under the same ownership for at least 30 years. The general approach of the owners is to plan and conduct their activities based on the site-specific conditions and the resource values identified on each harvest area. The owners draw on their past success and experience to adapt their practices to the conditions at each harvest site to ensure environmental values and forest productivity is maintained.

### Improvement Opportunities for Future Operations

The results of this audit show that MF landowners are aware of resource values on their properties and manage their activities in a manner consistent with the Act.

However, as the legislation is results-based and not procedural, owners are encouraged to maintain adequate internal processes to ensure that regulatory obligations continue to be met. It is important to encourage owners to take care in identifying and classifying small streams, and to carefully consider the potential effects of wind damage in streamside tree retention areas.

Small streams with low gradient channels can be difficult to identify if stream flow is seasonal and the channel is not well defined. Owners are therefore encouraged to ensure those responsible for identifying and classifying small streams are well informed regarding what is, and what is not a stream.

Windthrow is an issue that affects forests throughout the province. The auditors noted that some trees retained in buffer zones were subject to blowdown after the adjacent trees were harvested. Since windthrow is a natural process and no sites are immune from winds, with respect to future harvesting, windthrow could potentially affect water quality or fish habitat if channel banks are disturbed drastically. Owners are therefore encouraged to keep abreast of windthrow management research currently underway in the province to reduce windthrow that may relate to issues in their areas of operation.



View of Chapman Creek Valley near Sechelt



Douglas fir logs piled at roadside near Campbell River

## 5.0 Conclusion

The auditors found the forest management practices evaluated in the MFs audited comply with the practice requirements of the Private Managed Forest Land Council Regulation for soil conservation, reforestation, and water quality and fish habitat. Additionally, the auditors found that the harvesting, road construction/maintenance, and reforestation practices for all properties carrying out these activities during the audit period were effective in meeting the requirements.

The owners are implementing the legislation effectively. Operational practices on all properties are consistent with the intent of the legislation, and operations are protecting key environmental values. Overall, reforestation is being completed, there is conservation of the growing capacity of the soil and there are appropriate measures in place to protect fish, fish habitat and water quality. It is evident the owners are managing their land for growing timber and are protecting environmental values.

It is notable that the owners have considerable knowledge and operational experience with their properties. They have demonstrated sound understanding of their obligations, and their practices are suitable for the type of sites and conditions on their properties. Overall, their approach to planning and treatment execution is consistent with the intent of the legislation and ensures a high likelihood that regulatory obligations will continue to be met.

Sections 2.0 to 4.5 of this report describe the basis of the audit work performed in reaching this conclusion.

## Appendices

**Appendix I Maps**



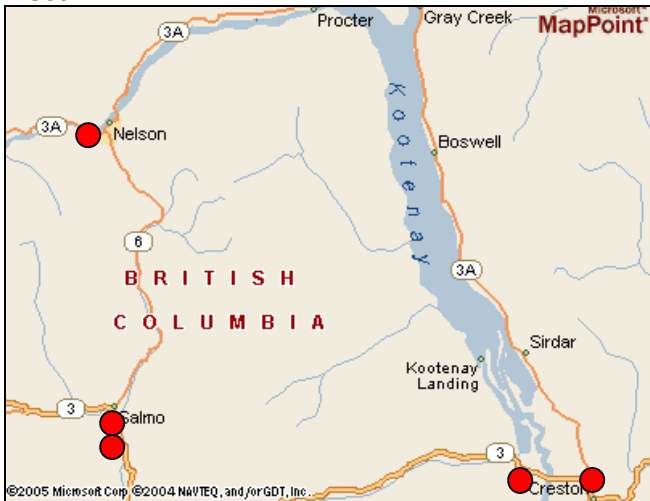
**Map of Southern BC**

**Inset #1**



**BC Coast Region**  
● = MF properties audited

**Inset #2**



**BC Interior Region**  
● = MF properties audited

## Appendix II Key Definitions and Terms

Note that regulations are from the Private Managed Forest Land legislation including the *Private Managed Forest Land Act*; the Private Managed Forest Land Council Regulation; the Private Managed Forest Land Regulation; and the Private Managed Forest Land Council Regulation.

**Act** means the *Private Managed Forest Land Act*

**Community Watershed** means a community watershed continued or established under the *Forest and Range Practices Act*

**Council** means the Private Managed Forest Land Council under section 4 of the *Act*

**Fish Habitat** means an area that is a fish stream or provides habitat for specified species of fish

**Fish Stream** means the portion of a stream that

1. is frequented by a specified fish species, or
2. has an average slope gradient of less than 20% for each 100 metres of slope distance, unless:
  - a. a fish inventory, carried out in accordance with methods acceptable to the wildlife minister, shows that it is not frequented by a specified species of fish, or
  - b. the portion of the stream is located upstream of a proven barrier to fish

**Licensed water supply intake** means a water intake that is in a water supply area or a community watershed contiguous to a water supply area; or is to provide water for human consumption and is licensed under the *Water Act* for a waterworks purpose or domestic purposes if the license is held by or subject to a water users community incorporated under the *Water Act*.

**Owner** means the person registered in the records under the *Land Title Act* as owner of the land for which there is a management commitment and that is classified as managed forest land under the *Assessment Act*.

**Private managed forest land** means private land for which there is a management commitment and is classified a managed forest land under the *Assessment Act*

**Regulation** means the Private Managed Forest Land Council Regulation (BC Reg. 336/2004)

**Specified species of fish** means one or more of the following species of fish:

anadromous salmonoids, rainbow trout, brook trout, kokanee, largemouth bass, smallmouth bass, mountain whitefish, lake whitefish, arctic grayling, burbot, white sturgeon, black crappie, yellow perch, walleye or northern pike

**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

1. has a continuous channel bed that is 100 metres or more in length
2. flows directly into a fish stream, fish-bearing lake or wetland, or a licensed waterworks

**Stream channel** means the area between the outermost opposing stream banks measured at the point where rooted terrestrial vegetation begins.

**Water supply area** means that portion of a community watershed that is on MF land.

**Wildlife minister** means the minister responsible for the administration of the *Wildlife Act* and includes a person authorized in writing by that minister.



## Appendix III Key Public Values, Objectives and Practice Requirements

The **Private Managed Forest Land Act** establishes forest management objectives, and the **Private Forest Land Council Regulation** (BC Reg. 336/2004) sets minimum standards of practice, for the protection of soils, water quality and fish habitat, and reforestation.

The Private Managed Forest Land Regulation (BC Reg. 341/2004) makes provision for the wildlife minister to establish an area on MF property as critical wildlife habitat for the survival of one or more species at risk.

The objectives and practice requirements are summarized below.

### Soils

The soil conservation objective for areas where harvesting is carried out is to protect soil productivity on those sites by minimizing the amount of area occupied by permanent roads, landings, and excavated trails.

The regulations require an owner who carries out timber harvesting to:

- Restrict the amount of area occupied by unproductive soil as a result of access structures to the minimum necessary to safely and efficiently conduct harvesting.
- Adequately rehabilitate and reforest temporary access structures.
- Minimize soil erosion and minimize any increase of landslide hazard.
- Take reasonable measures to minimize impact of erosion events.

### Water Quality and Fish Habitat

The water quality objective is to protect human drinking water both during and after harvesting. The objective for fish habitat during and after harvesting is to retain sufficient streamside trees and understory vegetation to protect the natural variation in stream temperature and to provide:

- sufficient cover and in-stream habitat for fish,
- a continuous source of nutrients and large woody debris,
- a vigorous mass of roots capable of controlling stream bank erosion; and
- a filter to prevent transport of sediment into stream channels

The regulation requires an owner who carries out timber harvesting in water supply areas and near fish habitat to:

- Retain understory vegetation and non-commercial trees within 5 metres of the edge of a stream channel to the fullest extent possible without damaging water supply installations, reducing water quality at supply installations or causing harm to fish or fish habitat.
- Ensure that woody debris or physical disturbance at a site do not result in damage to riparian areas that are seasonally occupied by one or more species of fish.
- Retain the minimum required number and size of trees on each side of every 100 metres of a stream channel as specified in the legislation for streams for two classes of streams channels; e.g.: 1.5 to 3 metres wide & 3 metres and wider.
- Ensure that roads constructed with running surfaces wider than 5.5 metres are at least 30 metres from the edge of a stream channel (with a width of at least 1.5 metres) except at a stream crossing.
- Ensure that if yarding timber across a stream with a channel of at least 1.5 metres that the timber is suspended over the stream and that damage does not occur to the stream banks, streambed, retained trees, fish, fish habitat or a licensed water supply intake.

- Ensure that if broadcasting fertilizer in a water supply area, the fertilizer is not applied within 100 metres upslope of a licensed water supply intake or within 10 metres of a flowing stream that is observable from the air, and to ensure the application does not cause nitrate levels in a stream to exceed 10 ppm downstream or cause water quality to fail to meet established water quality objectives.
- Notify the Council within 24 hours of becoming aware of a landslide or debris flow if the event has deposited debris into a stream on the owner's land after August 1, 2004.

General requirements for streams in the regulation requires that an owner who constructs or deactivates roads, trails, quarries or disposal sites or carries out timber harvesting must:

- Ensure that access structures are stable and streams are maintained in their existing courses.
- Ensure the amount of soil erosion that enters a stream is minimized.
- Ensure that machine tracks within 5 metres do not result in exposed mineral soil that leads to sedimentation.

### **Critical Wildlife Habitat**

The objective for critical wildlife is to facilitate long-term protection of habitat by enabling government to assess whether critical wildlife habitat is present and to foster efforts to protect critical wildlife habitat when present on private managed forest land.

When an area of critical wildlife habitat is established on a private managed forest, an owner must carry out any timber harvesting and related activities, and any road construction, in accordance with the requirements of the notice given or amended by the wildlife minister.

### **Reforestation**

The reforestation objective where timber has been harvested or destroyed is to promptly regenerate the areas with a healthy, commercially valuable stand of trees that is not impeded by competition from other plants or shrubs.

The regulation requires an owner of an area that is harvested or destroyed after the area became the owner's managed forest to:

- Restock the area within 5 years of completion of harvesting or the date the timber was destroyed with a minimum of 400 well distributed crop trees per hectare on the Coast and 600 trees per hectare in the Interior
- Regenerate the area within 15 years of completion of harvesting or date the timber was destroyed with a set minimum number of well distributed trees that exceed the height of competing vegetation by 50% on the Coast and 25% in the Interior.