

**ENVIRONMENTAL PREVIEW REPORT  
ON THE PROPOSED  
AMENDMENT TO THE CURRENT FIVE YEAR  
OPERATING PLAN (1997 – 2001) FOR DISTRICT 16  
MAIN RIVER AND SHEFFIELD LAKE AREAS**

**Submitted to:**

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TF07102**

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## EXECUTIVE SUMMARY

Corner Brook Pulp and Paper Ltd. (CBPP) has applied for an Amendment to its Five Year Operating Plan for Forest Management District 16, a large area which includes the watershed of the Upper Humber River and Main River. The Minister of Environment and Labour, in accordance with the Newfoundland Environmental Assessment Act has directed that an Environmental Preview Report be prepared. This document is submitted in fulfillment of the requirement, and is intended to comply with Guidelines released by the Minister on February 10, 2000.

The proposed Undertaking involves the relocation of operations within FMD 16, mainly to allow wood harvesting and delivery to the mill to continue throughout the 2000 and 2001 Spring periods. The undertaking does not involve any increase in the quantity of wood to be harvested. It does not affect other Forest Management Districts, and it does not extend beyond 2001, ie the period covered by the current Five-Year Operating Plan for FMD 16.

The existing system for forest management flows from a twenty-year plan (1996 – 2015) which has been developed for the Province by the Department of Forest Resources and Agrifoods (DFRA). Five year operating plans for each Forest Management District (FMD) are developed within the context of this twenty year plan, as are the annual wood harvest allocations which are set by DFRA for each FMD. Each proposed Five-Year Operating Plan is required to undergo examination in accordance with the requirements of the Newfoundland Environmental Assessment Act (NEAA). As well, any proposed amendments to the Plan must be registered in accordance with the Act. The current Five-Year Operating Plan for FMD 16 includes harvesting in the Main River watershed, as well as in other areas throughout the FMD. The plan covers the period up to the end of 2001.

DFRA manages the timber resources of the Province, and this includes focusing on recovery of material in an efficient manner, and with optimal use of wood fibre. Therefore emphasis is placed, for example on harvesting over-mature and mature trees (i.e. take the oldest wood first), and on recovering trees which have been damaged by blowdown, fires or insect infestation. The response to such unanticipated events can result in changes to the operating plans. The industry operates within an effective planning framework – a 20 year overall plan as developed by Forestry, individual five year plans for forest management districts, and annual plans with assignment of annual cut limits to ensure against over-exploitation of the resource.

The industry also recognizes that forests represent valuable ecosystems that need to be protected. In order to address key challenges of achieving sustainability with respect to economic as well as environmental integrity, CBPP subscribes to sustainable forest management practices. Consistent with the principles of sustainability, CBPP is an active participant in research and environmental protection measures which address issues such as protection of rare and endangered species (eg Pine Marten), support for wilderness preservation (eg designation of Main River Protected Corridor), integrated resource management principles (ecotourism, recreation, outfitting/hunting), landscape design planning (e.g. for Main River Lodge) and protection of ecosystem integrity (Model Forest).

The key challenge for achieving sustainability is not to make either-or choices, but rather to find the means to balance economic and environmental imperatives.

The current proposal is straight forward. CBPP is requesting approval to change location of its wood harvesting activities, not to increase the allowable volume of harvest. This requirement is to enable wood harvesting to continue through the Spring period when many woods roads are not suitable for traffic. The mill has an inventory shortfall as a consequence of the labour dispute which occurred last year. Normally, the inventory can sustain the mill through the Spring period when the flow of supply is reduced due to thaw conditions. The proposed amendment area in the Main River watershed has an existing network of high quality roads which can sustain Spring traffic, in part because the subgrade is not sensitive to frost heave.

The proposed wood harvesting of the Main River/Upper Humber area was subject to a comprehensive Environmental Impact Assessment Process, which resulted in a number of important mitigation decisions, all of which generally remain in effect. These measures included the designation of a protected corridor along the Main River, comprising approximately 7,600ha. The expressed intent of Government has been to declare this area (with some additions of Crown Land), as a Waterway Park, and to develop a management plan for the watershed which would enable the area to be designated as a Canadian Heritage River. CBPP, following its release from the EA process, then commenced building of woods roads in the area. Harvesting was interrupted with the discovery elsewhere of a large volume of blow-down timber which needed to be recovered before rot set in. This is an example of the adaptive approach which is required in order to implement efficient wood harvesting programs.

It should be emphasized that the proposed wood harvest program in the Main River watershed has been previously approved, and it will not compromise the nomination process for designation of the River as a Canadian Heritage River. In fact, the attention which this proposed undertaking has drawn may serve to expedite a nomination process which has been ongoing for over a decade.

Similarly, the concern about Pine Marten may result from a lack of knowledge about the measures in place to protect this species, and to develop a better understanding of critical limiting factors. CBPP is a participant in an MOU which supports a research program in the Main River area. A large scale monitoring program using tagged animals is attempting to understand the habitat requirements of the species. Defined areas will be subject to wood harvesting so as to provide information on the suitability of various habitat types, and successional stages of vegetation.

Most of the forest areas in Newfoundland (less so in Labrador) have been subjected to periodic incidents of wide spread losses of the canopy trees, usually as a consequence of forest fires or insect infestation, and more recently through wood harvesting. The maximum age of trees within most forest stands reflects the frequency of this cycle. The forests along the eastern side of the Northern Peninsula include some very old trees, in part because of the absence of these phenomena. Such a forest type is not common on the Island of Newfoundland, and there is little information on the overall distribution of "Gap Replacement" forest, as it is known. The available information, however confirms that this forest type is present over at least a major proportion of the Northern Peninsula, extending along the eastern side of the peninsula from Cloud River in the north, to Main River in the south, an area of approximately 4,800km<sup>2</sup>.

Using conservative figures, this forest type can be placed in context. The total coverage by this forest type in insular Newfoundland is at least 60 000 ha (based only on estimates for the Northern Peninsula). The Main River Protected Corridor (and adjacent buffer zones) contains an estimated 3,500ha, or 6 % of this total. The proposed undertaking will harvest from an estimated 1 500 ha, or 2.5 % of the total. While research would be required to gain a better quantification of the extent of this forest type, it is clear that the proposed undertaking does not threaten the viability of the Gap Replacement forest.

In planning this work, CBPPL has reviewed and revised the project so that mitigation has been “built in” rather than “added on”. For example, through consultation with the only outfitting operation in the harvest area, the road routing has been adjusted so as to protect the wilderness aspect of that operation. In fact it is expected that, as is the case with the existing road network, the modest extent of new woods roads (5 km total in Main River; 8 km total in Sheffield Lake) will be complementary to ongoing recreational and tourist activities in the area, including snowmobiling, canoing/kayaking, angling, and hunting. .

The EPR provides a discussion of eight issues identified in the Guidelines, as well as a number of others which emerged from the public consultation program conducted by the company. Each issue has been subjected to an evaluation of the available information. While some information gaps occur, these are not of such a magnitude as to prevent the prediction of impacts, but rather relate to the type of information which would be collected in support of the applications for permits and authorizations which follow after the release of the undertaking from NEAA. Mitigation measures have been identified where appropriate, and a prediction made of the residual impact of the undertaking. In no case is the predicted impact significant.

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## PREFACE

Corner Brook Pulp and Paper Limited carries out wood harvesting across its timber limits to supply wood fibre to its paper mill in Corner Brook. Five-Year Operating Plans are developed for each Forest Management District, and these go through registration under the Newfoundland Environmental Assessment Act. Thus, the current (1997-2001) Five-Year Operating Plan for Forest Management District 16 was approved by the Minister of Environment in 1996. Proposed amendments to the plan are also required to be registered under the Newfoundland Environmental Assessment Act. In December 1999 such a proposed amendment was registered under the Act, and the Minister subsequently determined that an Environmental Preview Report (EPR) would be required.

Following public notice, a set of Guidelines were issued (February 10, 2000) for the preparation of the EPR (Appendix A). This document has been prepared to meet the requirements of the Act, and to address these Guidelines. To assist in the review, pertinent sections of the Guidelines are repeated (*in bold italicized text*) throughout the document.

***“These Guidelines are intended to assist the proponent, Corner Brook Pulp and Paper Limited, in the preparation of an environmental preview report (EPR) for the proposed amendment to the current Five Year Operating Plan (1997-2001) for the Main River and Sheffield Lake areas (the Undertaking) located within Forest Management District 16.***

***The purpose of the EPR is to identify and address key environmental issues associated with the harvesting of timber, particularly in Main River region, and to address deficiencies in the registration document. The report is expected to contain a review of all readily available pertinent information. It is recognized that the report may be deficient in information resulting from data gaps in current databases. However, data gaps should be identified in the EPR. The EPR will be reviewed by the Minister to determine conformance with the guidelines and acceptability.***

***These guidelines have been prepared in accordance with the provincial environmental assessment legislation. The proponent should be aware that the Canadian Environmental Assessment Act may also apply.”***

Thus, the focus of the EPR has been on providing the required pertinent information so as to identify and address key environmental issues associated with the proposed undertaking. Most of these issues are identified in the Guidelines, however a public consultation program has also been carried out by CBPP in order to identify any further relevant issues, and these are also addressed within this document.

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## 1.0 INTRODUCTION

Corner Brook Pulp and Paper Limited (CBPP) in 1986, as part of its long term wood procurement program, proposed long term forest management of the Upper Humber/Main River area of Forest Management District (FMD) 16. This undertaking was subject to extensive environmental assessment and in August of 1986 the Environmental Impact Statement (EIS) was approved by the Minister of Environment. Subsequently, operations began in the Main River area in 1987, with the construction of approximately 20 kilometres of access roads and a bridge across the Main River. However, harvesting activities were interrupted when it was decided, in conjunction with the Newfoundland Forest Service, to temporarily relocate harvesting operations to the Upper Humber Region where a large area of blowdown timber had occurred. The rationale for this change in plans was to salvage this merchantable blowdown timber before it was lost to rot and decay.

Determining the areas of the Province which are suitable for timber harvesting, and establishing the quantities of timber to be harvested, are the management responsibility of the provincial Department of Forest Resources and Agrifoods (DFRA). In this role DFRA has developed a twenty year (1996 – 2015) forestry development plan (DFRA 1995).

Pursuant to this plan, CBPP filed a Five Year Operating Plan in 1996 (i.e. from 1997 until 2001) for FMD 16 with the Department of Forestry pursuant to the Forestry Act, and registered the undertaking with the Department of Environment and Labour pursuant to the Newfoundland Environmental Assessment Act. During the design of this harvesting plan input was sought from various government departments, community groups and the general public. A series of public meetings were held in April 1995 to outline and discuss proposed harvesting, silviculture and road construction activities within District 16. The intent of those meetings was to provide a forum for local user groups such as domestic cutters, outfitters, cabin owners and the general public to present their concerns and to gather information on the proposed work. The Five-Year Operating Plan was approved by the Minister of Environment and Labour in 1996 and CBPP was required to adhere to the conditions/commitments made in original Upper Humber/Main River EIS.

Since the implementation of the current five-year plan, CBPP has on two separate occasions, proposed amendments. In May 1997 an amendment was registered pursuant to the Newfoundland Environmental Assessment Act (NEAA) to harvest timber in the area of Voyins Brook, Silver Mountain and Hinds Brook. This amendment was approved by the Minister of Environment and Labour on June 23, 1997. In March of 1998, CBPP registered an amendment with DOEL pursuant to NEAA to harvest timber in the Hinds Lake area. This amendment was approved on June 24, 1998. In both instances, amendments to the current plan were sought to harvest in different locations within FMD 16 and not for additional volume.

CBPP are applying for a third amendment to the current Five-Year Operating Plan. This proposed amendment is within the existing allowable cut allocated for FMD 16, and includes the Main River area which was previously approved for harvesting in 1986.

**1.1 PROPONENT INFORMATION**

As per the Guidelines:

***“The EPR should contain:***

***the name of the corporate body and the mailing address.***

***the name of the chief executive officer, official title, telephone number, fax number and e-mail address.***

***the name of the principal contact person for purposes of environmental assessment, official title, telephone number, fax number and e-mail address.”***

**Corporate Body:** Corner Brook Pulp and Paper Limited  
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**Chief Executive Officer:** Allan Vatcher  
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Planning and Development Superintendent  
709-637-3469 (fax)  
E-mail: mchurchill@cb.kruger.com

## 2.0 PROJECT DESCRIPTION

As per the Guidelines: *“The proponent must include a written description of the geographical setting/location of the proposed undertaking. The undertaking area must be delineated on maps of a scale which will allow reviewers, including the general public, to accurately determine the location of the project and associated features.”*

### 2.1 PROJECT LOCATION

This proposed amendment to the current Five Year Operating Plan for Main River and Sheffield Lake Areas is located within Forest Management District (FMD) 16. This district consists primarily of the lower portion of the Great Northern Peninsula, bounded to the east by White Bay, to the south by the Gaff Topsails, to the west by Gros Morne National Park, and to the north by Forest Management District 17 (Figure 2.1). The nearest communities to the Amendment Areas within the district include Jackson’s Arm, Sops Arm and Pollard’s Point. Main River, a scheduled salmon river and a proposed National Heritage River flows from the Long Range Mountains in the west to White Bay in the east through FMD 16 (Figure 2.2). More detailed information on the aquatic resources of the Main River and its heritage status is presented in Section 4.0 (Existing Environment).

### 2.2 PROJECT DESCRIPTION

The construction, operation and rehabilitation associated with the proposed undertaking are described within this section.

#### 2.2.1 Capital Cost

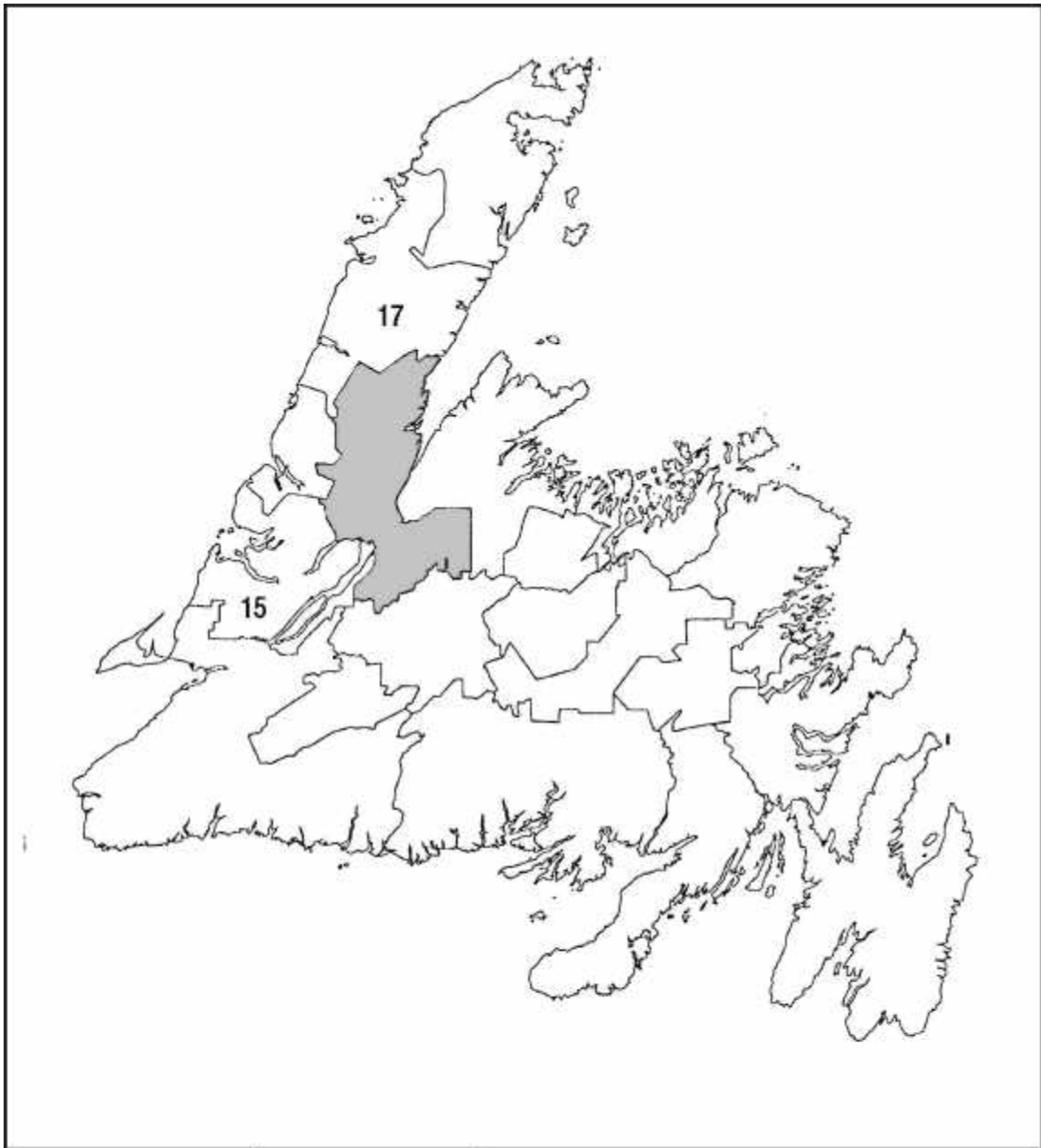
As per the Guidelines: *“The description should include an estimate of the capital costs of the project”.*

The new infrastructure associated with the project includes 13 km of new road construction, including ten stream crossings. The total capital cost of the project is estimated at approximately \$0.5 million (Table 2.1).

Table 2.1 Amendment to the Current Five-Year Operating Plan – Main River and Sheffield Lake Areas Capital Cost

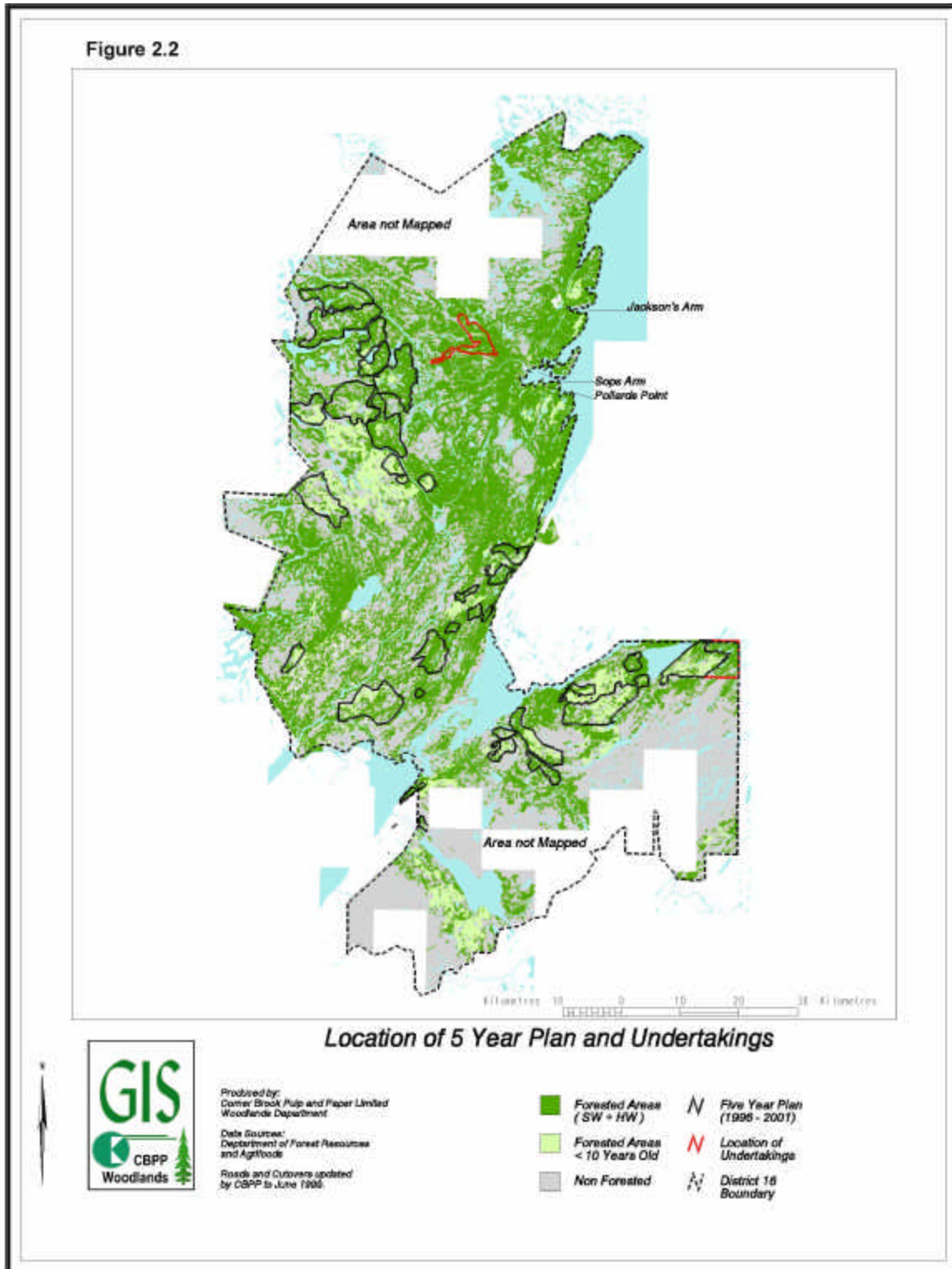
INFRASTRUCTURE	STATUS	CAPITAL COST (\$)
<b>Main River</b>		
5 km of new access road	Proposed for 2000	280,000
<b>East Sheffield</b>		
8 km of Forest Access Roads	Proposed for 2000 and 2001	200,000
<b>Total Capital Cost</b>		<b>480,000</b>

Figure 2.1 Map of Newfoundland showing FM Districts with #16 shaded.



		<b>CBPP</b>			
		 <b>AGRA</b> Earth & Environmental			
DRAWN	LWM	PROJECT	Main River/East Sheffield Lake Amendment EPR		
CHECKED	JHM	DRAWING	Forest Management District (FMD) 16		
FILENO.	TF07102	SCALE	DATE	DWG. NO.	REV.
			00/03/30	FIGURE 2.1	

Figure 2.2 Preview of FMD 16 relative to FMD 15 and 17 and showing communities. No age structure.





### 2.2.2 Harvesting Plan

As per the Guidelines: ***“The description should include an outline of the specific areas designated for harvest on maps including the age class structures and volumes of the proposed harvest areas.”***

Utilizing existing forest access roads originally constructed in the Main River Area in 1986, CBPP plans to harvest 60,000 m<sup>3</sup> of over-mature (i.e. greater than 81 years of age) Balsam Fir/Black Spruce in the Spring of 2000 (Figure 2.3). Construction of roads to be used in the Spring of 2001 will occur in the Summer and Fall of 2000. In the Spring of 2001, 60,000 m<sup>3</sup> of over-mature Balsam Fir/Black Spruce will be harvested in the Main River area (Table 2.2).

Harvesting operations in East Sheffield Lake Amendment Area are scheduled for 2001 and include harvesting 35,000 m<sup>3</sup> of over-mature Black Spruce/Balsam Fir timber (Figure 2.4; Table 2.2). Forest access roads will be constructed in both the Summer of 2000 and 2001. While the forest age class structure for the Main River and Sheffield Lake areas is outlined in Figures 2.3 and 2.4, a more detailed inventory and description of the forest resources in the region is provided in Section 4.0 (Existing Environment).

Figure 2.3 Proposed Watercourse Crossings, Main River Area. Include age class structure and indicate 2000 cut boundary and 2001 cut boundary.

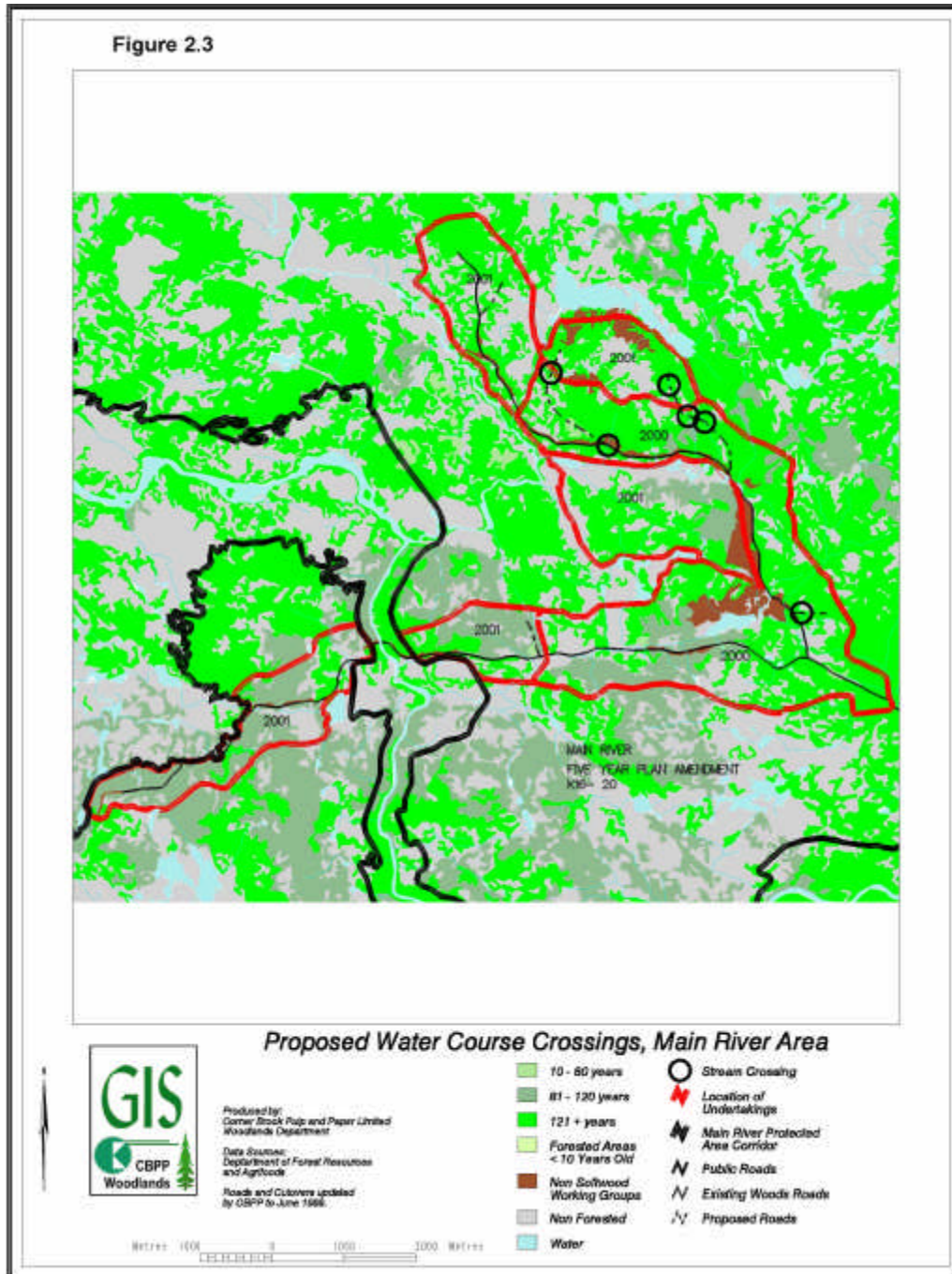


Figure 2.4 Proposed Watercourse Crossings – Sheffield Lake Area – include age class struc

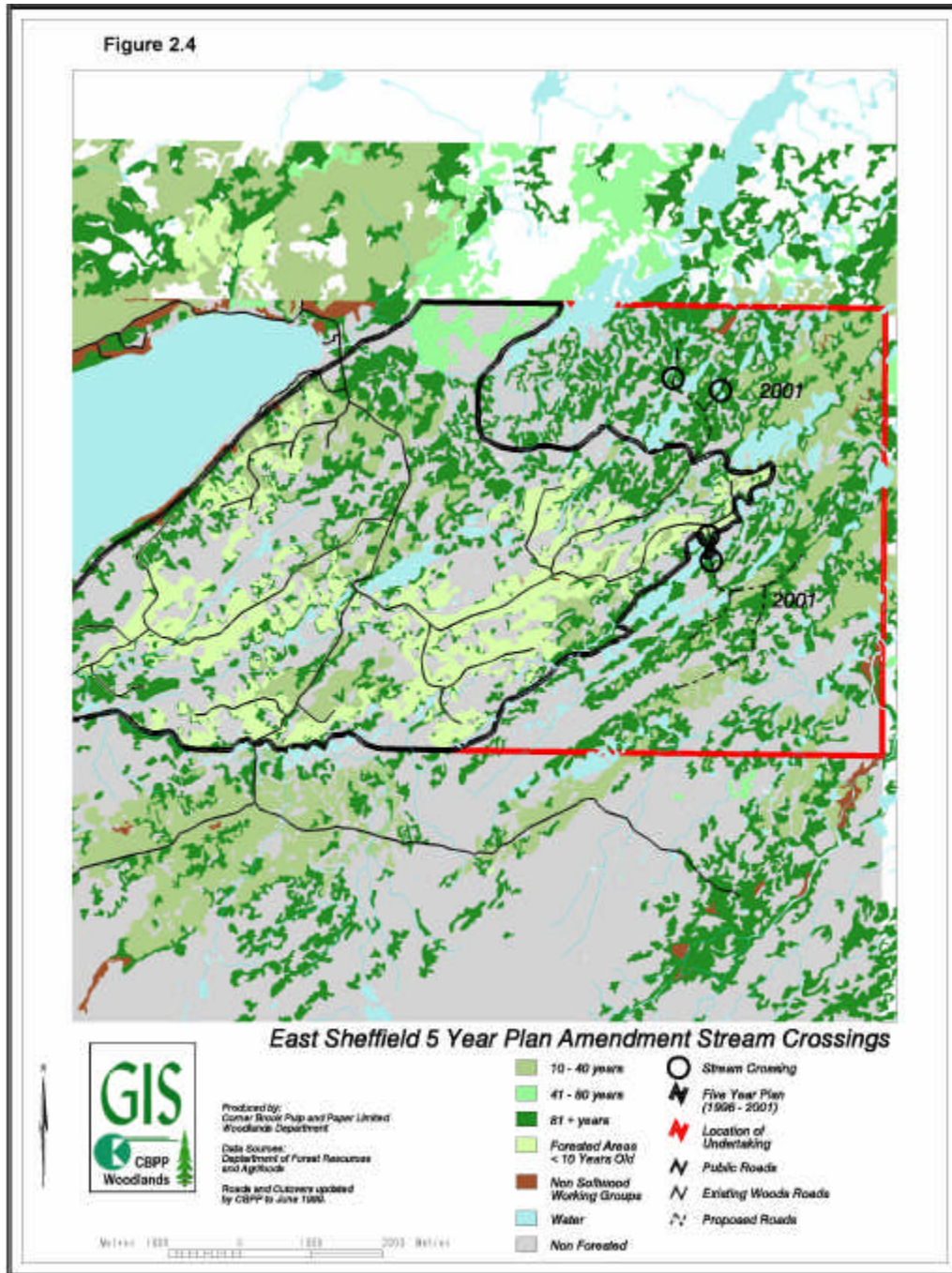


Table 2.2 Annual and Total Harvesting Volumes for Amendment Areas.

Operating Area	Harvesting Volumes/Year		
	2000	2001	Total
Main River	60,000 m <sup>3</sup>	60,000 m <sup>3</sup>	120,000 m <sup>3</sup>
East Sheffield	0	35,000 m <sup>3</sup>	35,000 m <sup>3</sup>
Total for Amendment Areas	60,000 m <sup>3</sup>	95,000 m <sup>3</sup>	155,000 m <sup>3</sup>

### 2.2.3 Residual Areas to Remain Unharvested

As per the Guidelines: ***“The description should include the residual areas to remain unharvested in areas previously approved.”***

Harvesting activities completed to date as part of the current five year operating plan for FMD 16 have focused on the Upper Humber – Main River, Voyins Brook and the Hinds Lake – Deer Lake areas. Other areas where Summer harvesting has occurred or is planned include White River Ridge, Eastern Ridge, Eagle Mountain and Wigwam Brook. Areas where Winter harvesting has occurred or is planned include Burnt Hill Lakes, Humber North Branch/Eastern Ridge, Junction Brook and Kitty’s Brook areas Figure 2.2 outlines these previously approved areas.

This proposed amendment involves replacing timber from an area approved within the current operating plan, with an equal volume of timber from an area that was approved in a previous plan. The areas that, as a result of this amendment, will not be harvested in the current Five-Year Operating Plan for FMD 16 include portions of several operating blocks in the southern part of the Main River watershed, and in the Upper Humber River area (Figure 2.2). The net effect will be that no additional volume will be harvested as a result of this proposed Amendment.

### 2.2.4 Harvesting Methods

As per the Guidelines: ***“The description should include the proposed method of harvesting.”***

Timber harvesting is to be conducted using a combination of conventional and mechanical logging methods. The harvest system chosen for a specific operating area is based on stand and terrain conditions and other site-specific concerns identified for the area.

There are two methods of harvesting to be used in both the Main River and East Sheffield areas. The First is known as Manual Shortwood harvesting and involves manual felling, delimiting and cutting the wood into 2.5 meter lengths at the stump. The wood is then picked up and transported to the roadside by a mechanical forwarder. The second method involves using a mechanical harvester for tree felling, delimiting and cutting the wood into lengths. The wood is then picked up at the stump and transported to the roadside by a mechanical forwarder.

### 2.2.5 Silviculture and Reforestation

As per the Guidelines: ***“The description should include proposed silviculture or reforestation plans.”***

Silviculture strategies are important elements of forest management, serving to maximize the quality and quantity of the future wood supply. Silviculture operations practiced by CBPP in FMD 16 involve pre-commercial thinning (PCT) and planting.

For the proposed Amendment Areas, CBPP plans to continue its silviculture strategy as is currently applied to other areas of harvest in FMD 16 and elsewhere. This involves monitoring the quantity and quality of natural re-growth that occurs in the First 1 to 10 years following harvesting. Planting of seedlings will occur as deemed necessary to supplement natural re-growth. PCT activities would then be applied to thin any overly dense young natural regeneration. By thinning the forest, growth is concentrated on fewer trees and the time that is required for these trees to reach merchantable volume is reduced.

The use of silviculture techniques enable significant volumes of wood to be available for harvesting more quickly, thereby reducing the amount of harvesting required in new areas. CBPP works in association with DFRA to define silviculture operational needs and also to conduct silviculture research and development into new techniques. CBPP's total silviculture expenditures are in the order of \$3,000,000 annually. As part of the current five-year operating plan for FMD 16, CBPP has started and will be completing 330 ha of PCT and 350 ha of planting.

### 2.2.6 Access Roads and Watercourse Crossings

As per the Guidelines: ***“The description should include the location of existing and proposed resource road corridors including the rationale for the proposed access roads outside the boundaries of the amendment as depicted in the registration document.”***

CBPP plans to construct a total of 13 kilometers of access roads in the Amendment Areas (Table 2.3). The undertaking as proposed will include no access roads outside the boundaries of the Amendment Areas. All roads will be built to CBPP Class II and Class III standards. This road construction is the minimum required to harvest the merchantable timber within FMD 16 for the years 2000 and 2001.

The five kilometers of roads to be constructed in the Main River area are extensions to existing roads and are intended to provide access for Spring harvesting requirements. Construction of these sections of road will occur in the Summer and Fall of the year 2000. The locations of six watercourse crossings associated with the Main River area access road construction are shown in Figure 2.3.

Table 2.3 Road Construction Schedule

Operating Area	Road Construction in Kilometers/Year		
	2000	2001	Total
Main River	5	0	5
East Sheffield	5	3	8

The eight kilometers of roads to be constructed in the East Sheffield area are extensions to existing roads and will provide access to merchantable timber in the area. The four watercourse crossings associated with access road construction in the East Sheffield Amendment Area are shown in Figure 2.4.

### 2.2.7 Current Five Year Operating Plan (1997 – 2001)

As per the Guidelines: “**The description should include an estimate of the annual allowable cut (AAC) for the current 5 year forest operating plan and a statement of how this amendment affects the AAC.**”

While the current Five-Year Operating Plan for FMD 16 covers the period 1997-2001, the current Annual Allowable Cut (AAC) for the Province is allocated by the Newfoundland Forest Service (NFS) for each Forest Management District for the period 1996-2000. Table 2.4 compares AAC with actual and proposed/anticipated wood harvest for FMD 16 over the period 1996-2001. Note that the Province is currently reviewing the provincial AAC and new harvest levels will be allocated for the period 2001-2005. It is assumed that the AAC for FMD 16 will not change significantly. As shown, the proposed amendment is within the allocated AAC available to Corner Brook Pulp and Paper Ltd. for FMD 16 and no additional harvest over the sustainable level allocated by the NFS is proposed.

Table 2.4. Actual and Projected Harvesting Volumes versus Annual Allowable Cut for Forest Management District 16.

	1996	1997	1998	1999	2000	Total 5 Year Harvest	2001*
Five Year Average Annual Allowable Cut	225,000	225,000	225,000	225,000	225,000	1,125,000	225,000
Actual Harvesting Volumes	317,042	270,380	223,015	123,733			
Approved/proposed Volumes for Near future Harvesting					190,830	1,125,000	225,000

\* - Estimate only: AAC for 2001 is currently under review by NFS.



### **2.2.8 Next Five Year Operating Plan for Forest Management District 16 (2002 – 2006)**

As per the Guidelines: ***“The description should include the relationship of the proposed amendment to the anticipated next 5 year forest operating plan for District 16 (2002 – 2006) including a statement of whether the future operating plans will propose forest harvesting activities in the Main River watershed or region.”***

This proposed amendment is part of the current plan that will expire at the end of 2001. The proposed amendment is separate from the next five year operating plan for FMD 16 (2002 – 2006).

CBPP intends to submit its next five year operating plan in the Fall of 2001. This new plan outlining harvesting volumes and locations for the period 2002 – 2006 will be prepared pursuant to DFRA’s 20 year Forestry Development Plan (1996-2015) which promotes the use of sustainable development principles, ecologically based management philosophy and sound environmental practices. CBPP will also design its next five-year plan with extensive public and government input; hence, it is premature to make any definitive statement as to the operating area to be covered by this plan. Nevertheless, it is likely that future operating plans will include forest harvesting activities in the Main River watershed region. Such activities will take place within the context of any applicable legislation and policies, especially with respect to management of the Main River, and protection of Pine Marten. On that basis, it can be stated that the next five year plan will not intrude into the Main River protected corridor and will not interfere with the Pine Marten study (as per the existing draft Memorandum of Understanding between CBPP and DFRA).

### **2.2.9 Regulatory Framework**

As per the Guidelines: ***“The description should include a discussion of federal, provincial and municipal government legislation and policies which apply to the project. The EPR should provide a list of regulatory approvals which are required for the undertaking.”***

The proposed amendment to the current Five Year Operating Plan for Main River and Sheffield Lake Areas will undergo environmental assessment as part of two processes: the provincial environmental assessment process and the federal environmental assessment process. This document has been submitted in compliance with the requirement for an “Environmental Preview Report” level of assessment under the Newfoundland Environmental Assessment Act (NEAA). The federal process will involve screening by various federal agencies and that level of assessment may well be adequate to address requirements of the Canadian Environmental Assessment Act (CEAA).

The purpose of these processes is to identify project and environmental interactions, and to assess the environmental effects from the proposed project. Following approval, a series of federal/provincial regulatory permits/authorizations are required prior to start of construction or during project implementation.



A list of anticipated federal, provincial and municipal permits/licenses/authorizations that may be required for this undertaking are presented in Table 2.5. Applications for these approvals will be submitted by CBPP or its contractors as required, and in a timely manner once the undertaking has been released from the Environmental Assessment Process.

Table 2.5 Permits/Licenses/ Authorizations that may be required for the Amendment to the Current Five-Year Operating Plan for Main River and Sheffield Lake Areas.

PERMIT, AUTHORIZATION, APPROVAL	AGENCY
<b>FEDERAL</b>	
Release under the CEAA	Relevant Federal Department
Transportation of Dangerous Goods	Transport Canada
Authorization for Works or Undertakings Affecting Fish and Fish Habitat	Department of Fisheries and Oceans
Permit for Construction Within Navigable Waters	Canadian Coast Guard, DFO
Notification to Handle or Transport Dangerous Goods	Transport Canada
<b>PROVINCIAL</b>	
Release from the Environmental Assessment Process	Government of Newfoundland and Labrador Department of Environment and Labour Environmental Assessment Division
Certificate of Environmental Approval for any alteration to a body of water	Government of Newfoundland and Labrador Department of Environment and Labour Water Resources Division
Water Use Authorization	Government of Newfoundland and Labrador Department of Environment and Labour Water Resources Division
Permit for Access off any Highway	Government of Newfoundland and Labrador Department of Works, Services and Transportation Transportation Regulation Enforcement
Authorization to Handle or Transport Dangerous Goods	Government of Newfoundland and Labrador Department of Works, Services and Transportation Transportation Regulation Enforcement

PERMIT, AUTHORIZATION, APPROVAL	AGENCY
Borrow and Quarry Permit	Government of Newfoundland and Labrador Department of Mines and Energy Mineral Lands Division
Authorization to Control Nuisance Animals	Government of Newfoundland and Labrador Department of Forest Resources and Agrifoods Wildlife Division
Permit to Burn	Government of Newfoundland and Labrador Department of Forest, Resources and Agrifoods Forest Fire Protection
Commercial Cutting Permit	Government of Newfoundland and Labrador Department of Forest, Resources and Agrifoods Newfoundland Forest Services
Operating Permit	Government of Newfoundland and Labrador Department of Forest, Resources and Agrifoods Newfoundland Forest Service
Certificate of Approval for Storage and Handling of Gasoline and Associated Products as per Fire Protection Act and GAP Regulations.	Government of Newfoundland and Labrador Department of Government Services and Lands Operations Division
Certificate of Environmental Approval to establish, alter, enlarge or extend a waste management or a waste disposal site or incinerate as per Waste Material Disposal Act.	Government of Newfoundland and Labrador Department of Government Services and Lands Operations Division
Permit in accordance with Urban and Rural Planning Act for access onto a Protected Road.	Government of Newfoundland and Labrador Department of Government Services and Lands Operations Division
Permit for Flammable and Combustible Liquid Storage and Dispensing and for Bulk Storage	Government of Newfoundland and Labrador Department of Government Services and Lands Engineering Services
License of Occupation to Occupy Crown Land	Government of Newfoundland and Labrador Department of Government Services and Lands Customer Services

PERMIT, AUTHORIZATION, APPROVAL	AGENCY
<b>MUNICIPAL</b>	
Approval for Waste Disposal	Town/Community Council

### 2.2.10 Navigable Waters Protection Act

As per the Guidelines: ***“The description should include:***

***The proponent should be aware that there was insufficient information provided on watercourse crossings which may require approval under the Navigable Water Protection Act (NWPA). Therefore, the EPR should provide information on the location of each proposed watercourse crossing and the associated infrastructure (e.g., bridge or culvert). The same information should be provided regarding the existing bridge across Main River for approvals pursuant to NWPA and the Canadian Environmental Assessment Act.”***

Detailed engineering surveys will be conducted at each stream crossing prior to road construction to assess ground profile and the expected stream flows in a given return period. This information will be used to design appropriate watercourse crossings using either a bridge or culvert. The survey information, bridge or culvert design will be incorporated into permit applications to be submitted to the Water Resources Division of the Department of Environment and Labour (DOEL), the Department of Fisheries and Oceans (DFO) for fish and fish habitat considerations, and to the Canadian Coast Guard (CCG) to determine any requirements with respect to the Navigable Waters Protection Act.

The existing bridge that was constructed by CBPP in 1987 as part of its approved forest harvesting operations in the Main River area will be utilized for this proposed undertaking. The bridge location is shown on Figure 2.3. The steel and concrete bridge is approximately 65 m in length from the banks of the river and has a height above the mean water level of approximately 13 meters (height above high water level is approximately 10 m). The bridge is a single span, hence there are no piers in the river. A copy of the Certificate of Approval and application (includes sketches of bridge) are included in Appendix B.

### 3.0 RATIONALE AND ALTERNATIVES

As per the Guidelines: ***“The proponent must provide a statement of the need for the proposed amendment. In particular, the proponent should address the apparent immediate need to address the potential wood supply deficit anticipated during Spring season of 2000. Justification for proposing an extra year (2002) in this amendment outside the approved 5 year plan (1997 - 2001) must be addressed.”***

#### East Sheffield Lake

The East Sheffield Lake Amendment Area is proposed in order to maintain operation efficiencies, as harvesting in the Sheffield Lake area is ongoing. The Amendment Area will allow operations to continue, rather than moving to another harvesting location.

#### Main River

The mill has a current wood inventory shortfall as a result of a labour dispute at the mill (strike by outside workers) that occurred from July to August, 1999. The mill operated during the first half of the strike and consumed all the pulpwood inventory in the mill yard prior to halting operations. Once the strike was over and operations resumed, all efforts were required in the Fall and Winter to supply the mill with its immediate wood requirements and to keep it operational. The strike also affected the forest access road construction such that the roads constructed following the strike are not suitable for use in the Spring of 2000.

During the Fall of 1999 and the Winter of 2000, woods operations were not able to build up enough inventory to sustain the mill through the Spring period. Typically, the mill maintains in excess of 150,000 m<sup>3</sup> in inventory at roadside or in the mill yard by the end of December. In the past that inventory, along with normal Winter harvesting operations, would have been sufficient to sustain the mill through the Spring when trucking is virtually halted due to soft, muddy roads. In 1999, the year-end inventory of pulpwood was down by approximately 50,000 m<sup>3</sup>. This shortfall demanded that actions be taken to identify any harvesting sites which would be accessible for the transport of pulpwood during Spring conditions and capable of delivering full capacity to the mill, something CBPP has never before had to do.

The shortfall for Spring wood as a direct result of the strike can be eliminated by the end of 2001, one year earlier than had been first calculated. Consequently, the project has been redesigned since it was registered to eliminate the need for Spring harvesting in 2002. All activities for 2002 within FMD 16 will be proposed as part of the next five year operating plan (2002- 2007).

### 3.1 ALTERNATIVES

As per the Guidelines: ***“An analysis of alternatives within the undertaking (methods of carrying out the same action) and alternatives to the undertaking must be presented. The proponent must present an analysis of alternatives to meet the need for the project including justification for the preferred alternative. This should include a discussion of possible alternatives that could address the potential wood supply deficit for the Spring season of 2000.”***

An assessment of alternatives is an important mechanism by which engineering, environmental and socio-economic factors are incorporated into the process of selecting the most appropriate site and/or project design. This process included an analysis of alternatives to and within the project, and has resulted in the selection of a preferred alternative for wood supply.

### **3.1.1 Alternatives to the Project**

Alternatives to the project include other alternative sources of wood to support mill operations. Other sources of wood supply to meet the Spring operational requirements of the mill include the importation of wood via barge. The importation of wood to the mill was considered as an alternative, but is deemed not to be feasible for economic and technical reasons, including:

- **Ice Conditions:** The waters of the Gulf of St. Lawrence as far south as Port aux Basques are often affected by ice cover, mainly pack ice formed in the Gulf. This ice cover can hamper marine transportation, especially of a barge under tow. For this reason, the importation of wood to the mill during the Winter or Spring has not been attempted to date.
- **Negative Economic Effect:** CBPP is a Newfoundland-based company employing local people with forestry operations of sufficient magnitude designed to support its operations. Importing wood from outside the Province would mean the loss of local economic benefits from local forestry operations.
- **Availability:** The likely source for wood importation is the province of Quebec. That province supports a large forestry industry and is involved in defining its sustainable harvesting limits. It is not likely that an application to have an alternative wood supply from Quebec would be approved in time to support Spring operations for 2000.
- **Cost:** The importation of wood is cost-prohibitive compared to other alternatives.

Another alternative to the project is the “no action” alternative whereby no Spring wood is harvested. This would result in mill shut-down with significant layoffs at the mill and considerable indirect negative effects to contractors and suppliers to mill and woodland operations. The Corner Brook mill is a year-round operation. The market supplied by CBPP has particular demands during each season of the year. This is reflected in the way that the mill is designed and operated based on continuous operations. To shut the mill for two months in the Spring would jeopardize market access and long term market stability, and hence is not a viable alternative.

### **3.1.2 Alternatives within the Project**

Alternatives within the project include the various sites which may be viable for harvesting and transporting wood during the Spring of 2000 and 2001.

### 3.1.2.1 Site Selection Criteria

The criteria used to determine site suitability for Spring harvesting activities include:

- Presence of existing roads ;
- Suitability of access roads to support traffic during Spring conditions;
- Suitable forest structure for harvesting, including age and proportion of Black Spruce;
- Environmental considerations for transporting wood in the Spring; and
- Cost and schedule.

### 3.1.2.2 Site Descriptions

Other potential sites exist within Forest Management District 16 and within certain other districts that have annual allowable cut (AAC) allocated to CBPP. Merchantable timber stands exist within Forest Management Districts 15 and 17 that are considered as possible alternative sites. District 15 is located directly west and southwest of FMD 16 and has been subject to previous harvesting activities. District 17 is located north of FMD 16 and has AAC for this year.

#### Forest Management District 15

There are two sites within FMD 15 that are alternatives for Spring 2000 and 2001: Whitewash Road and North Lake Road. Whitewash Road is located near the northern boundary of the district, while North Lake Road is located approximately 15 km southeast of Whitewash Road. The volume of timber in both of these areas is sufficient to meet a portion of the need, however as can be seen from Figure 3.1, the age class structure includes maturing trees between 41 and 80 years which is less suitable for harvesting than over-mature tree stands. Both roads are of similar construction, being composed of silty material with a topping of gravel. Such a roadbed is not suitable for supporting traffic during the Spring period. The roads are also being plowed all Winter, therefore the frost will be coming out of the road during the Spring period leading to potential problems with mud and siltation.

#### Forest Management District 17

This district is located north of FMD 16 and contains one alternative site: East River (Figure 3.2). The East River Road includes a subgrade comprised of very silty material and no gravel topping, so that the roadbed would not be suitable for traffic during Spring conditions, with damage to the road and the vehicles the likely consequences of its use. It is located in proximity to a waterbody containing fish and fish habitat, making the potential for siltation and muddy conditions a negative environmental effect. The forest resources in the area are 81 + years Balsam Fir representing over-mature forest stands suitable for harvest.

Figure 3.1 FMD 15 showing existing access roads and harvesting areas with age structure

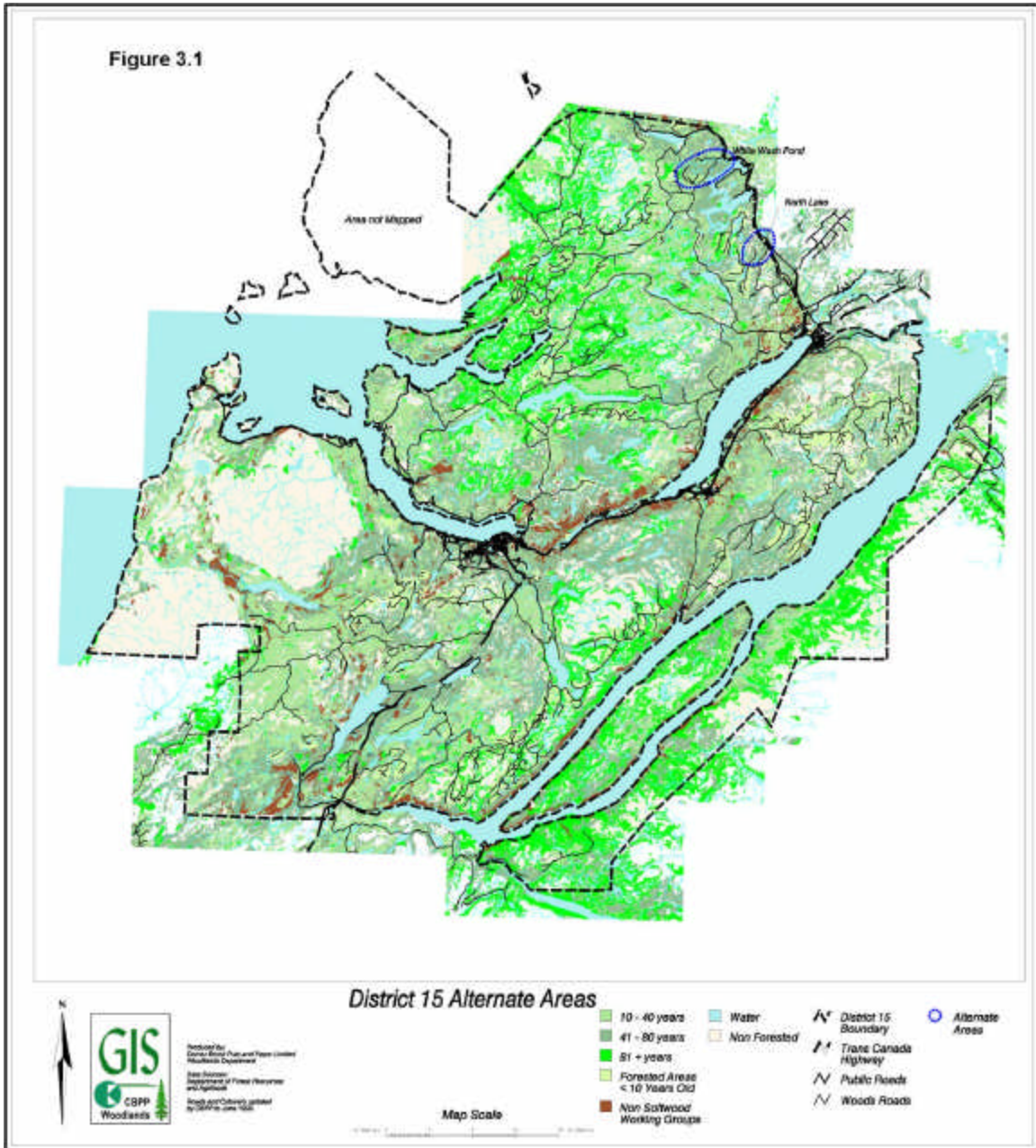
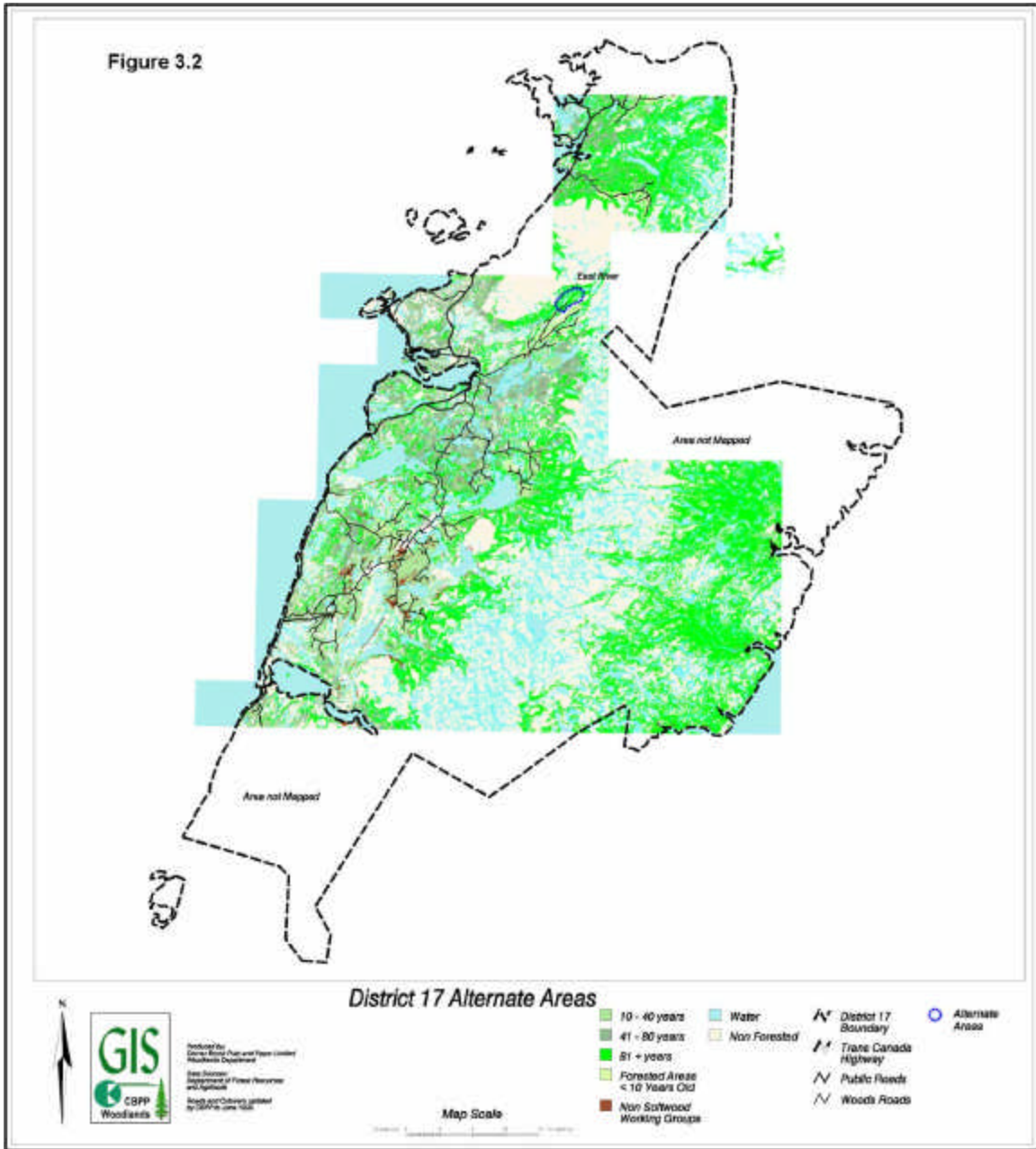


Figure 3.2 FMD 17 showing existing access roads and harvesting areas with age structures





### Forest Management District 16

The alternative sites within FMD 16 are: Burnt Hill Lakes Branch/Eastern Ridge; Canoe Pond Road; and the Main River Amendment Area (Figure 3.3). The Burnt Hill Lakes Branch/Eastern Ridge roads have been plowed all Winter, making them unusable in the Spring as the frost is coming out of the ground. These roads have been used in the past during the Spring, however with poor results. During most years the roads were rendered unusable for a period of one to two weeks due to wet and muddy conditions. There is also a salmon river in proximity to this road leading to the potential for environmental effects from runoff and siltation. The Canoe Pond Road is located in the southern end of the district. This road contains a questionable subgrade comprised of silty material and lacks a gravel topping. The timber resources in this area include a combination of maturing 41 – 80 and 81+ over-mature stands.

The terrain in the Main River Amendment Area is rocky and well suited for Spring harvesting. The roads as constructed in 1986 have a rocky foundation and a heavy gravel topping. The forest structure within the Main River area contains over-mature stands of Balsam Fir and Spruce which is required to supply a balanced species mix for mill operations.

#### **3.1.3 Analysis of Alternatives**

The various alternatives were compared with respect to technical, environmental and economic criteria (Table 3.1). The Main River Amendment Area was identified as the preferred alternative. Forest harvesting in these areas would involve less physical disturbance and a lower potential for siltation of any nearby waterbodies. The existing roads in the Main River Amendment Area have been ideally constructed for Spring harvesting and have not been plowed or used this Winter. No other alternative site can give the same degree of dependability to ensure that the wood harvested may be transported to the mill. The forest age structure contains a good mix of over-mature Balsam Fir and Spruce which meets the requirements of mill operations.

Figure 3.3 FMD 16 with existing access roads, approved harvest areas and age structure.

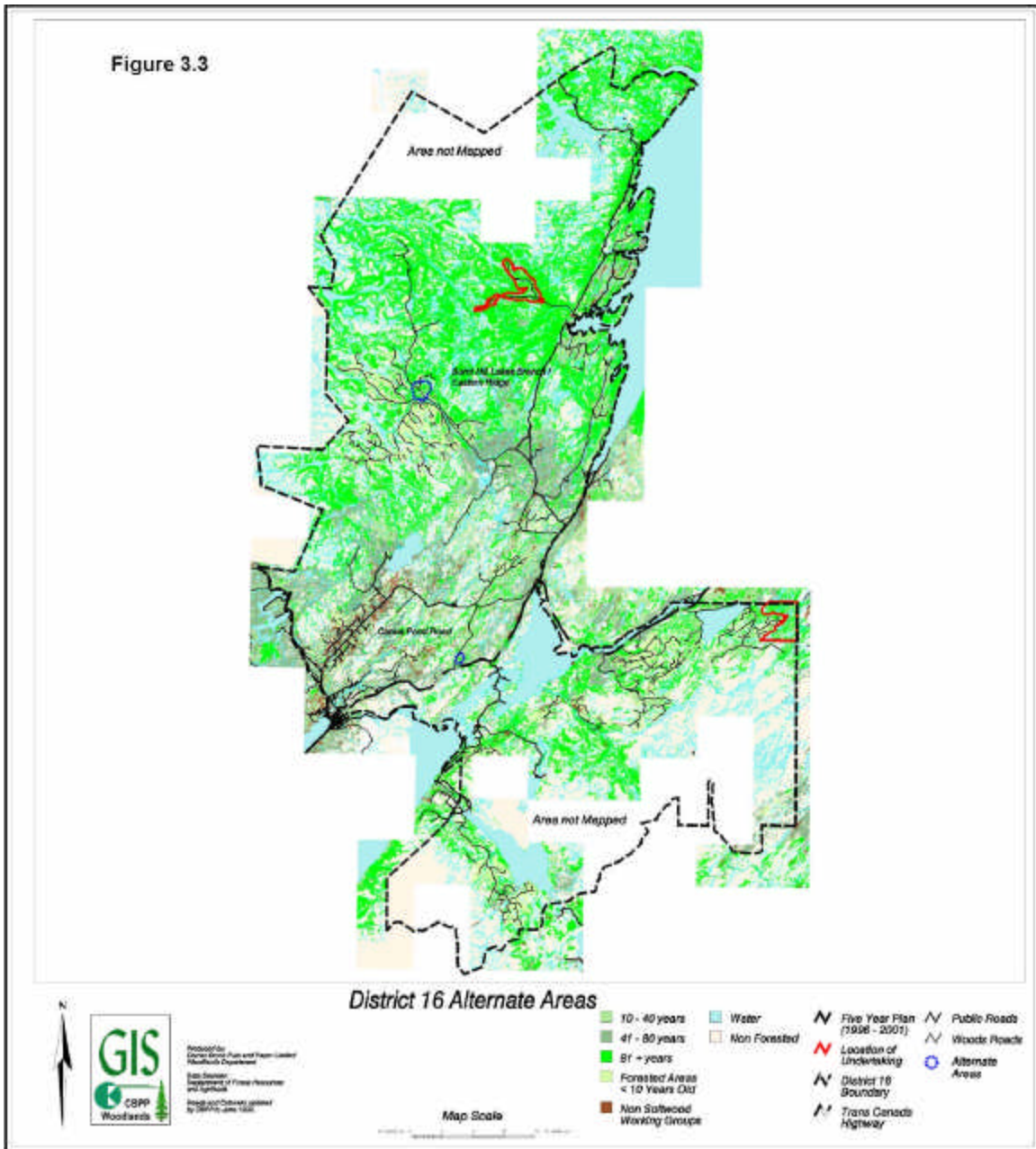


TABLE 3.1 SUMMARY OF ANALYSIS OF ALTERNATIVES

Alternative	Advantages	Disadvantages
Whitewash Road	<ul style="list-style-type: none"> <li>-Available AAC</li> <li>-Mix of Balsam Fir and Spruce</li> </ul>	<ul style="list-style-type: none"> <li>-Silty road construction with gravel topping and plowed – less dependable for transport</li> <li>-Proximity to waterbody</li> <li>-Not harvesting over-mature trees.</li> </ul>
North Lake Road	<ul style="list-style-type: none"> <li>-Available AAC</li> </ul>	<ul style="list-style-type: none"> <li>-Silty road construction with gravel topping and plowed – poor dependability for transport</li> <li>-Proximity to waterbody</li> <li>-Not harvesting over-mature trees.</li> <li>-Low percentage of Spruce</li> </ul>
East River	<ul style="list-style-type: none"> <li>-Over-mature forest 81+ years</li> <li>-Available AAC</li> </ul>	<ul style="list-style-type: none"> <li>-Silty road construction with no topping – less dependable for transport</li> <li>-Proximity to waterbody</li> <li>-Low percentage of Spruce</li> </ul>
Burnt Hill Lakes Branch / Eastern Ridge	<ul style="list-style-type: none"> <li>-Available AAC</li> <li>-Over-mature forest 81+ years</li> </ul>	<ul style="list-style-type: none"> <li>-Silty road construction with gravel topping and plowed – poor dependability for transport</li> <li>-Proximity to waterbody</li> <li>-History of poor road dependability during Spring period</li> </ul>
Canoe Pond Road	<ul style="list-style-type: none"> <li>-Available AAC</li> <li>-Contains a mix of Balsam Fir and Spruce</li> </ul>	<ul style="list-style-type: none"> <li>-Silty road construction with poor subgrade and no topping – poor dependability for transport</li> <li>-Some harvesting of maturing trees</li> </ul>
Main River And Sheffield Lake areas	<ul style="list-style-type: none"> <li>-Available AAC</li> <li>-Contains a mix of Balsam Fir and Spruce</li> <li>-Over-mature forest 81 + years</li> <li>-Good subgrade and topping</li> <li>-Has not been plowed this Winter</li> </ul>	<ul style="list-style-type: none"> <li>-Proximity to waterbodies</li> </ul>

## 4.0 EXISTING ENVIRONMENT

As per the Guidelines:

***“The proponent is not required to collect baseline information through field studies. However, readily available information should be used to describe the biophysical and socioeconomic environment and the resources that will or may be affected directly or indirectly by the undertaking.”***

### 4.1 BIOPHYSICAL DESCRIPTION

There is a useful collection of survey and study material available for the Main River watershed. Much of this information is directly applicable to the proposed Amendment Area and provides an adequate basis for the identification of potential environmental effects (see especially the Upper Humber/Main River Wood Harvesting Operation Environmental Impact Statement (Northland Associates, 1986) and the draft Management Plan for Main River as a Canadian Heritage River (Parks and Natural Areas Division, 1998).

The Sheffield Lake area has a smaller quantity of available information, however it is adequate to provide a basis for the relatively few environmental issues associated with this portion of the proposed Amendment Area.

#### 4.1.1 Main River Amendment Area

Most of the Main River watershed lies within the Northern Peninsula Ecoregion, with only the upper headwaters extending into the Long-Range Barrens Ecoregion. Figure 4.1 illustrates the Ecoregions and subregions of Insular Newfoundland. The Amendment Area near Main River is located in the Eastern Long-Range Subregion of the Northern Peninsula Ecoregion.

##### 4.1.1.1 Climate

Meades and Moores (1994) state that the Northern Peninsula Ecoregion differs from most other forested parts of the island by the shortness of the vegetation season; 110-150 days compared to 145-170 days for other areas. The frost-free period is comparable to most other areas and somewhat better than in central Newfoundland.

The Environment Canada Digital Database of Canadian Climate Normals (1961-1990) contains climate information compiled from long-term weather stations on the Northern Peninsula. The monthly and annual means of those parameters recorded are presented in Table 4.1. The 1992 Department of Environment and Labour Water Resource Atlas of Newfoundland also provides summaries of mean yearly air temperature, mean annual precipitation, mean annual snowfall, and mean annual days between first ice and last ice for the Island of Newfoundland.

Figure 4.1. Ecoregions and Subregions of Insular Newfoundland (after Damman 1983).

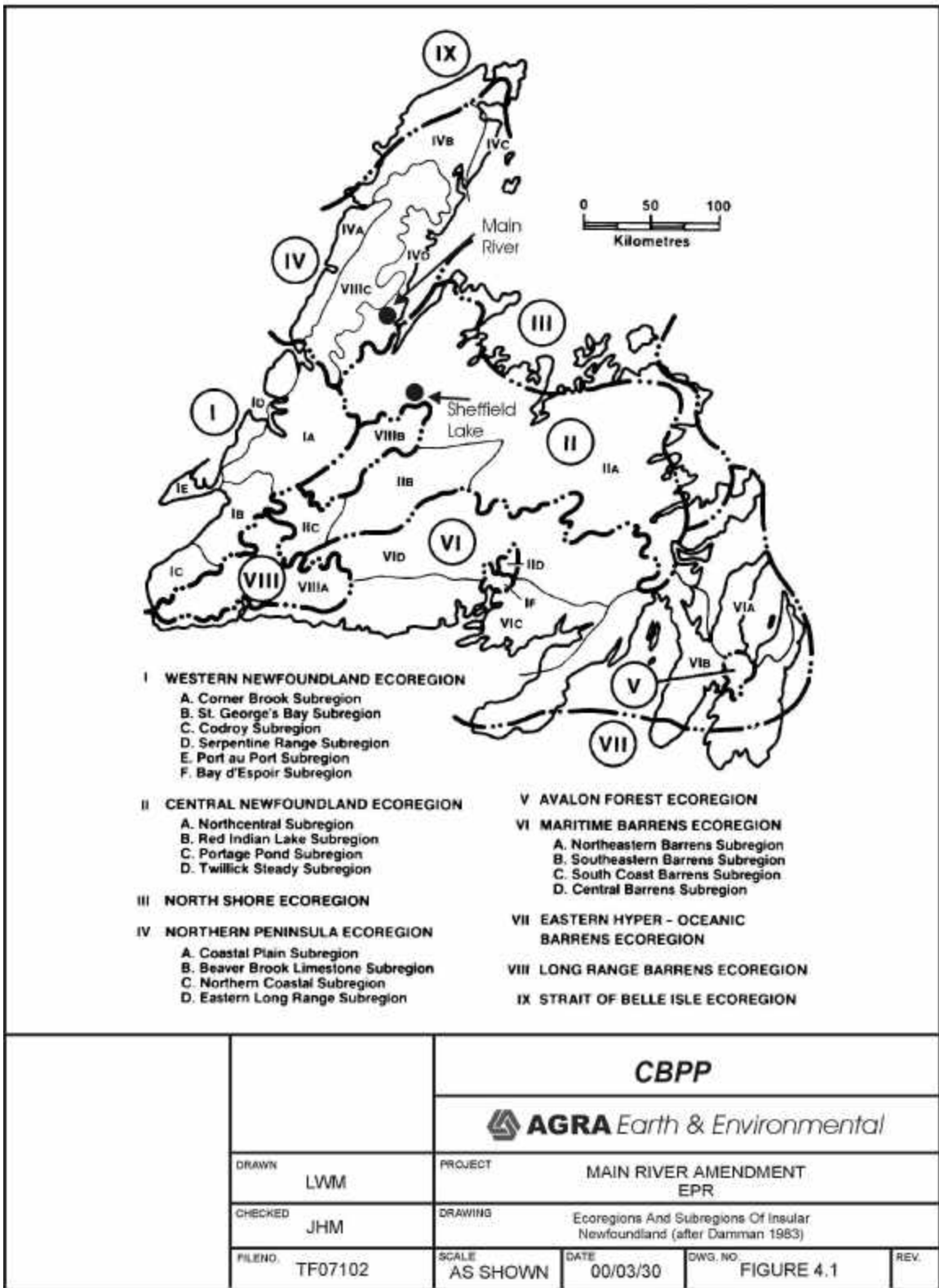


Table 4.1. Monthly and annual mean climate data recorded on the Northern Peninsula.

From the above data sources, the mean yearly temperature in the Main River area is estimated to be between 3 and 4°C. This compares with an Island-wide range of from 5°C (on the Avalon and Burin Peninsulas) to 1°C (on the northern portion of the Northern Peninsula). Mean annual precipitation in the Main River area ranges from 1000mm near its mouth to 1150mm at its headwaters. Mean annual snowfall for most of the Northern Peninsula is 350 cm and the mean number of days between first ice and last ice is approximately 115.

During the Summer months, the Northern Peninsula is significantly cooler than the interior of Newfoundland because of its higher latitude. Precipitation is lower, but, because of low Summer temperatures and shorter vegetation season, soil moisture supply is probably adequate at most times (Meades and Moores 1994).

#### 4.1.1.2 Geology

Limestone underlies most of the region, with acidic rocks more common on the eastern side of the peninsula (Meades and Moores 1994). The bedrock within the area is composed of leucocratic to melanocratic gneiss, quartz-rich gneiss, and subordinate amphibolite and granitic to gabbroic gneiss (Northland Associates 1986).

#### 4.1.1.3 Soils

The soils in the Northern Peninsula Ecoregion are comparable to those of western Newfoundland (Meades and Moores 1994). The Main River area has been typified by high hills (up to 657 m ASL) with steep slopes (Northland Associates 1986). The hilltops are either exposed bedrock or contain a thin mantle of organic solids (10-30 cm deep) over bedrock. Farther down the slopes are relatively shallow podzolic soils which have formed on a thin till overburden. Iron pans are abundant and common on mid- and upper-slopes throughout the entire Main River area. Seepage gleysolic soils are present near the toe of most slopes. Slope fens, basin bogs and organic complexes are present in most depressions.

#### 4.1.1.4 Vegetation

Balsam Fir is described as the dominant forest cover in the Northern Peninsula Ecoregion except at high elevations (300-400 m) on the eastern side of the peninsula, where black Spruce appears to be a natural component of the stands (Meades and Moores 1994). The Eastern Long-Range Subregion includes the productive but inaccessible forest on the eastern slopes of the Long Range Mountains up to the 450m elevation. The forests tend to be somewhat open Balsam Fir-Black Spruce mixtures (Meades and Moores 1994).

On the upper slopes of the steep hills in the Main River watershed, where vegetation is supported, softwood scrub grows. As the slopes are descended, better quality stands of mature and over-mature balsam Fir and Black Spruce occupy relatively shallow podzolic soils (Northland Associates 1986). The lower slopes usually support good quality balsam Fir and Black Spruce stands.

The dominant forest-type in the Main River watershed (which includes the Amendment Area) was identified as *Pleurozium*-Balsam Fir (Northland Associates 1986). This forest

type is characterized by Meades and Moores (1994) as having dry to well drained soil. The litter and humus layers are generally 10-20cm deep with a rooting zone at 30-40cm. The expected pH for this forest type is 3.8-4.2. Further detail on the forest structure, including age structure, is presented in the Section 4.7 (Forest Structure).

#### 4.1.2 Sheffield Lake Amendment Area

The Sheffield Lake Amendment Area is located in the Northcentral Subregion of the Central Newfoundland Ecoregion (Figure 4.1).

##### 4.1.2.1 Climate

Central Newfoundland has the most continental climate of any part of insular Newfoundland. Meades and Moores (1994) describe the Northcentral Subregion as having higher Summer maximum temperatures, lower rainfall and higher fire frequency than anywhere else in Newfoundland. The provincial Water Resource Atlas (DOEL 1992) indicates that the East Sheffield Lake area has a mean annual air temperature range of 3 to 4 °C. Mean annual precipitation is estimated at 1000mm with a mean annual snowfall of 250cm. The mean number of days between first ice and last ice is approximately 110 days.

##### 4.1.2.2 Geology/Soils

The Sheffield Lake area is composed of intrusive and cover rocks. Intrusive rocks are granitic and gabbroic (DOEL 1992). Most of the igneous intrusions in Insular Newfoundland are granite. The cover rocks are mostly shallow marine and subaerial clastic sedimentary rocks (DOEL 1992).

The Northcentral Subregion extends from Clarendville in the east to Deer Lake in the west and for the most part has a rolling topography below 200 m (Meades and Moores 1994). The rolling to undulating topography is characterized by shallow, medium quality till with a soil texture range from sandy loam to loam. There are also local areas covered by poor sandy till over glacio-fluvial deposits and outwash deposits along some of the major river systems such as the Terra Nova, Exploits and Indian River. The Sheffield Lake area is described as a mixture of Veneer and Blanket surficial geology (DOEL 1992). Veneer consists of till, usually less than 1.5m depth, over bedrock. The till is a mixture of grain sizes from clay to boulders, and has been deposited by glacial action. Blanket surficial geology consists of till greater than 1.5m.

##### 4.1.2.3 Vegetation

Pure Black Spruce forests and Aspen stands dominate this area because of the prevalence of fire in the natural history of the Subregion (Meades and Moores 1994). Mid-slopes are dominated by the *Hylocomium*-Balsam Fir forest type, or the Black Spruce-Feathermoss forest type on seepage gleysols after fire. Relatively low moisture, coarse soils and the prevalence of Black Spruce cover types make this Subregion particularly susceptible to regeneration failure. Specific forest structure of the East Sheffield Lake Amendment Area is provided in Section 4.7.



## 4.2 NEWFOUNDLAND PINE MARTEN

As per the Guidelines: ***“the description should include:***

***a description of the Newfoundland Marten resource with a description of the current study on the effects of forest harvesting on the Newfoundland marten.”***

The Newfoundland Pine Marten (*Martes americana atrata*) has been listed as endangered since 1996 by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).

Historically, Pine Marten were distributed throughout the boreal forests of North America (Hagmeier 1956). On the Island of Newfoundland, Pine Marten were once found in most forested areas, although never in great numbers (Bergerud 1969; Snyder and Hancock 1985). Historical densities on the island appear to have been highest in the Grand Falls and Corner Brook sections of the boreal forest (Bergerud 1969). By the early 1900s, Pine Marten populations had begun to decline (Snyder 1984).

Trapping is thought to have been extensive in the early 1900s (Bissonette et al. 1988) and was perhaps one of the major causes of the initial decline of the island population. Habitat disturbance may also have played some role in the initial decline. Forest Fires and insect damage destroyed extensive portions of the Island's suitable Pine Marten habitat in the late 1890s and early 1900s (Northland Associates 1990). The practice of clear cutting for pulp wood began about 1920 for the Grand Falls mill, while the Corner Brook mill did not open until 1925. Commercial wood harvesting is therefore considered to have had a minor role in the initial decline (Northland Associates 1990).

While trapping of Pine Marten on the island has been closed since 1934, the population appears to have continued its decline so that, by 1960, the species' range was no longer contiguous. At that time, it was estimated that there was one remnant population in north-central Newfoundland in the vicinity of Gander Lake, Northwest Gander River, and Gambo Pond, and a second population in the western part of the island, concentrated in and south of the Grand Lake-Little Grand Lake area (Bergerud 1969). By 1994 the island population was estimated to be approximately 300. In 1985, Pine Marten were thought to be primarily restricted to a few isolated areas of mature and over-mature forests in western and central Newfoundland (Snyder and Hancock 1985). By 1995, they were considered to be restricted to a few areas of mostly mature forest in western Newfoundland (Forsey et al. 1995).

Pine Marten on the Northern Peninsula do not appear to have ever been present at high densities. Bergerud (1969) stated that Pine Marten north of Parson's Pond were probably never common. A live-trap survey of the valley around St. Paul's Big Pond in 1975 revealed no Pine Marten (or scat) in the area despite the fact that it was considered good habitat (Mayo 1975). It was concluded that if a population existed, it was small and scattered. In 1997, a Pine Marten baiting program was initiated in the Silver Mountain/Burnt Hill Lakes area as part of the Silver Mountain Hydroelectric Project's baseline data collection (AGRA 1997a). In this study, no Pine Marten were baited within the Silver Mountain/Burnt Hill Lakes area however, one Marten was baited

just north of Birchy Flats in a forest area which had been previously harvested (approximately 60 years ago).

Sightings and accidental trappings have been recorded near Main River and the north side of Deer Lake during the late 1960s and early 1970s (Skinner 1974). Pruitt (1970) recorded a single Pine Marten sighting in the Silver Mountain area and there are trapping records from the 1920's of Pine Marten in the area that is now Gros Morne National Park (Mayo 1975). There have also been unconfirmed Pine Marten sightings near White's River (south of Silver Mountain) and an animal snared near Taylor's Brook (AGRA 1997a).

In an attempt to establish populations outside the known concentration areas, Pine Marten were introduced into the headwaters of the La Poile River (Mayo 1976a), the Main River area (1976b), Siviars Island (Porter 1976), and Terra Nova National Park (Bateman 1985). It appears that the introductions to Siviars Island and La Poile River have been unsuccessful (Bissonette *et al.* 1988). In the Main River area, Pine Marten were released by the Provincial Wildlife Division at the upper end of Big Steady. In total, eleven animals were released; six in 1976 and five in 1978 (Northland Associates 1986).

As part of a current study on the response of Pine Marten to a modified harvesting strategy, live trapping and tagging in the Main River watershed has been ongoing since 1998. The harvesting regime within the Pine Marten study area will have areas of unmodified harvesting, modified harvesting, and no-harvesting. Figure 4.2 outlines the study area. The first two years of the study involved the monitoring of Pine Marten presence or absence on systematically distributed live-trapping sites throughout the study area prior to the initiation of logging in the area. Overall, 31 Pine Marten have been captured; 18 individuals were captured in 1998 (7 males and 11 females) and 20 individuals (10 males and 10 females) in 1999. Of those captured in 1999, 7 animals (4 males and 3 females) were recaptures. Results from this year are not yet available. Preliminary comparisons (of the number of captures per 100 trap nights) with the results reported in the Little Grand Lake/Red Indian Lake areas confirms that the Main River Study Area is currently a relatively high density area for Newfoundland Marten. This current study is to continue until March 2005.

Figure 4.2. Pine Marten Study Area Boundary, Main River.



### 4.3 MAIN RIVER AND THE CANADIAN HERITAGE RIVER SYSTEM

As per the Guidelines: ***“The description should include:***

***a description of the current status of the nomination of the Main River to the Canadian Heritage River System.”***

The Main River has been studied and identified since the early 1970s as an area deserving of protection because of its high quality natural features and relatively pristine condition. Areas of the river such as Big Steady have a high value with respect to their natural features which facilitate low impact recreational activities. Progress towards achieving special designation of the area has been slow, and usually associated with the environmental impact assessment of a proposed intrusive development such as the Lower Churchill HVDC Transmission Line (1979-80).

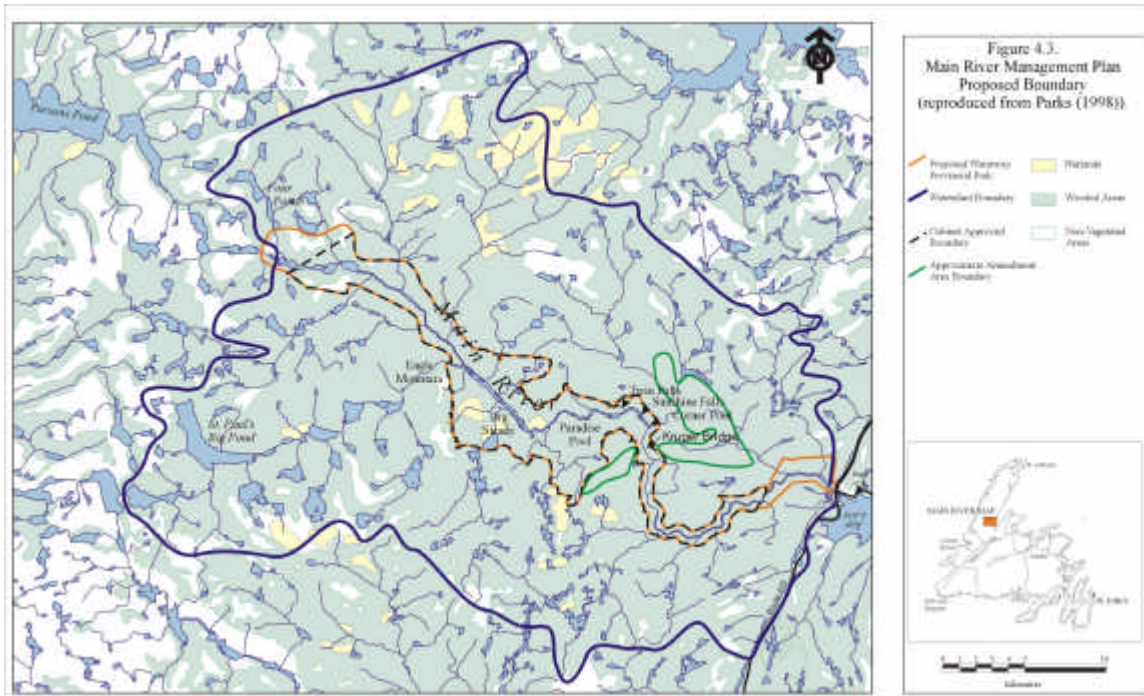
In 1985–86 the province’s Wilderness and Ecological Reserves Advisory Council (WERAC) became an active intervenor with respect to the Environmental Impact Assessment completed on the proposed wood harvesting program for the Upper Humber/Main River area. In developing a set of mitigation measures, the Proponent (Corner Brook Pulp and Paper Ltd.) defined a proposed corridor along the river valley within which wood harvesting activities were to be restricted. It was proposed that 5,234 ha of land around the Big Steady area be set aside as a “reserve”, and that a buffer zone comprising an additional 2,382 ha of land along the river corridor be set aside to reduce the impact of development along the entire river (Figure 4.3). Corner Brook Pulp and Paper Ltd. agreed to suspend logging activity within this zone, and to return timber rights to the Province. In accepting the Upper Humber/Main River EIS, the Province (through Minute of Council 949-87) approved this boundary, which has since been identified as a “Protected area Corridor”.

Since 1987, efforts have been made by officials in the Parks Division (now Parks and Natural Areas Division, Newfoundland Department of Tourism, Culture and Recreation) to achieve some level of special status for the river in order to preserve it as an area with outstanding natural and recreational features. These efforts have focused on the designation of Main River as a Canadian Heritage River.

The objectives of the Canadian Heritage River System are to give national recognition to the important rivers of Canada and to make sure that they are managed such that:

- The natural and human heritage which they represent is protected and understood; and
- The opportunities they offer for recreation and learning are available for residents of and visitors to Canada.

Figure 4.3. Main River Protected Area Corridor.



Thus, selected rivers should have outstanding value with respect to at least one of three features: natural heritage; recreational features; or human heritage

The selection process for a Canadian Heritage River requires the submission of a formal Nomination, which can result in the acceptance of the river as a Candidate. The next step is the development of a Management Plan, which includes consideration of stakeholder input, and which provides a mechanism to protect those values for which the river was nominated. Thus, as part of the selection process, the applicable government (in this case, the Province) must commit to the implementation of protection measures which can include special designation of the river. Only once a final approved Management Plan is in place will a candidate receive formal recognition as a Canadian Heritage River.

In 1989, a Background Study was completed (LeDrew, Fudge and Associates, 1989) to determine whether the Main River merited designation as a Canadian Heritage River. This study confirmed that the watershed contained valuable natural and recreational features, along with potential for human heritage features, and that these features made the system a suitable candidate for nomination.

As a result of the recommendation of the Background Study, the Main River was formally nominated as a Canadian Heritage River (Department of Environment and Lands, 1990). The Nomination was accepted by the CHRS Board, and the process of developing a Management Plan initiated.

In July 1992, Parks Division staff held Public Open Houses in Sop's Arm and in Corner Brook on concept alternatives for a management plan and to receive comments on the concept of managing the Main River as a Canadian Heritage River. A second round of Public Open Houses were held in June, 1995 to discuss contents of the draft Management Plan. Key concerns expressed were with respect to achieving the required level of protection without impeding local patterns of resource utilization.

In its identification of Concept Alternatives, the Province considered legislative mechanisms which could be applied to the Main River area, and replace the temporary measures put in place by the 1987 Cabinet directive. The choices included designation (under the Wilderness and Ecological Reserves Act) as a Wilderness Reserve or an Ecological Reserve, or designation (under the Provincial Parks Act) as a type of Waterway Park. The latter choice was identified as most appropriate to meeting the management objectives for the area (but could affect some resource uses, e.g hunting). In 1997, amendments were made to the Provincial Parks Act with respect to Waterways Parks. These amendments were directed towards accommodating the proposed management objectives for Main River, and its designation as a Canadian Heritage River.

The present intent is to designate an area of 105km<sup>2</sup> as a Waterway Park. This area comprises 15% of the Main River watershed and encompasses the designated "Protected Area Corridor", plus Crown Land in the headwaters and near the mouth of the river. The draft Management Plan for the Main River has been revised (Parks and Natural Areas Division, 1998), and is still under review.

The current approach is to first achieve designation of a Waterway Park, and then submit a final Management Plan to the CHRS Board. In the meantime, annual

extensions to the nomination process are requested by the Province (L. Daley, pers. com.).

While there has been no change in the preservation status of the Main River since 1992, it is worth noting that at the time of the original nomination, the CHRS Board was apparently satisfied that the Main River Protected Area Corridor would provide a level of protection which would be adequate to support its designation as a Canadian Heritage River.

#### 4.4 HISTORICAL AND CURRENT NAVIGATION OF PROPOSED WATERCOURSE CROSSINGS

As per the Guidelines require: ***“The description should include:***

***historical and current utilization of proposed watercourse crossings for navigational purposes (eg. recreational, commercial, subsistence, etc.).”***

There is no direct information available on utilization of the proposed Amendment Area watercourses, however the indications are that neither current nor historical utilization for recreational, commercial or subsistence activities occur.

No recreational (canoe/kayak) routes have been indicated within either the Main River or Sheffield Lake Amendment Areas (Murphy *et al.* 1995). Further, the proposed road crossing locations are in stream sections that have periodic low flow regimes. Commercial and subsistence navigational activities do not occur in either Amendment Area.



#### 4.5 FISH, FISH HABITAT AND FISHERIES

As per the Guidelines require: ***“The description should include:***

***a description of Fish, Fish Habitat and Fisheries (eg. recreational, commercial, subsistence, etc.) associated with the proposed stream crossings.”***

Fish species found within the Main River Amendment Area are brook trout (*Salvelinus fontinalis*) and sea-run and/or landlocked Atlantic Salmon (*Salmo salar*). There is no direct information available regarding the proposed stream crossings. This information is required as part of the applications for Instream Works Affecting Fish and Fish Habitat. Fisheries within the Amendment Area may include trout fishing, however, most Atlantic salmon angling would occur in the main stem of Main River and possibly Big Brook.

Fish species found within the Sheffield Lake Amendment Area have not been documented, however, it is reasonable to assume that brook trout and ouananiche are present. Site specific information regarding the proposed stream crossings is not available. This information is required as part of the applications for Instream Works Affecting Fish and Fish Habitat. Fisheries within the Amendment Area are probably restricted due to the lack of access, however, recreational angling is possible.

Detailed baseline information regarding the fish, fish habitat and fishing within the Main River Amendment Area is provided below.

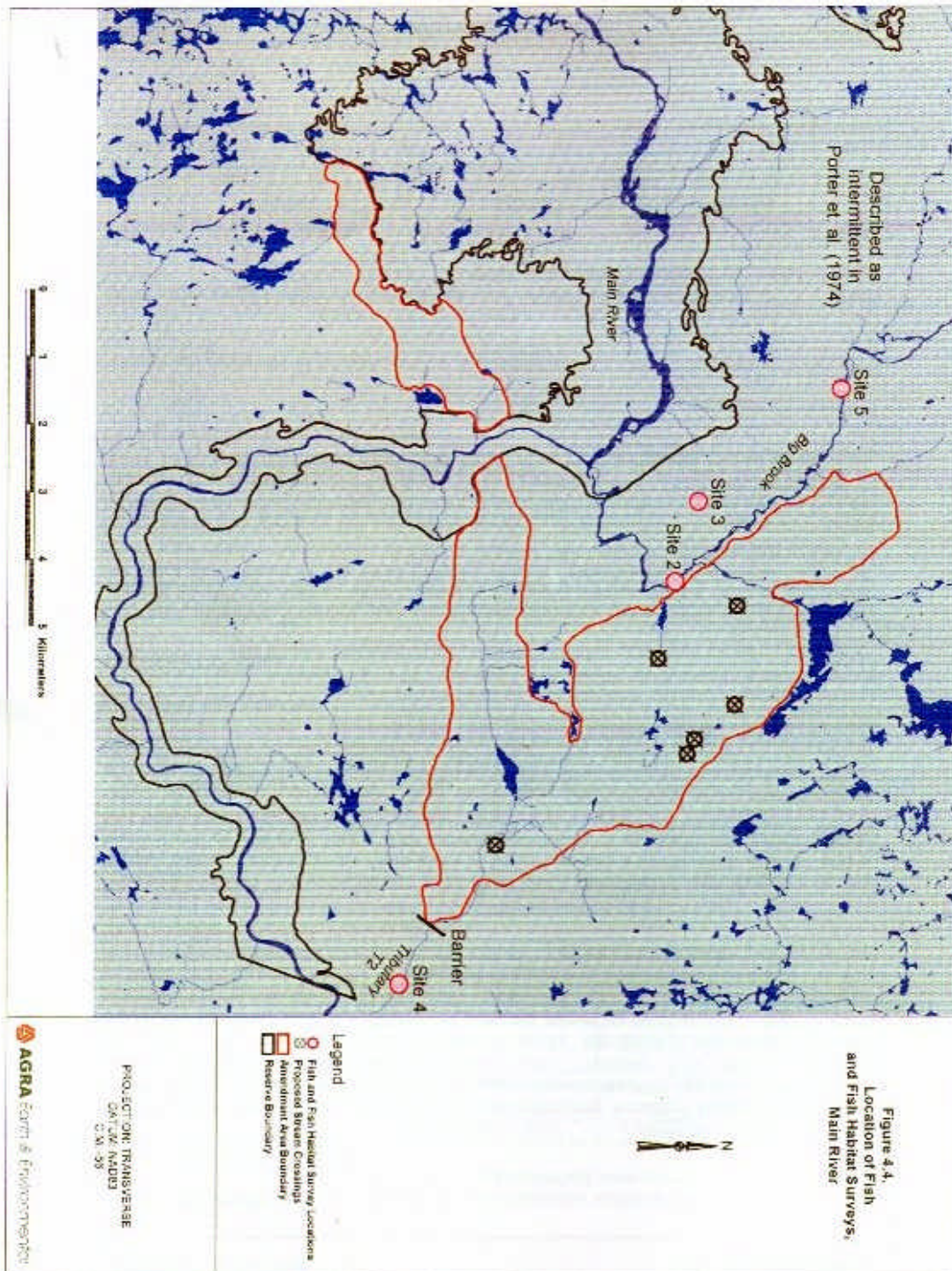
##### 4.5.1 Fish and Fish Habitat

In the Upper Humber/Main River Wood Harvesting Operations Environmental Impact Statement, fish and fish habitat surveys were conducted in the area of the proposed Main River Amendment (Northland Associates 1986). A review of those tributaries surveyed identified two tributaries within, or in very close proximity to, the proposed Amendment Area; Big Brook and Tributary T2 (Figure 4.4).

Field investigations were conducted in the Main River area between August 23 and August 28, 1985. During this time period, fish habitat was mapped in Big Brook and Tributary T2. Mapping was conducted using visual assessment procedures and helicopter support. Visual assessments of the main stem and other tributaries were also conducted by DFO and reported in Riche and Traverse (1971) and Porter *et al.* (1974).

Concurrent with habitat mapping, fish density estimates were also performed within representative stream reaches. A selected stream site was enclosed with barrier nets and electrofished in order to get a population estimate. The densities of salmon fry, salmon parr, and brook trout were computed separately and the mean biomass of the catch of each of these groups at each site was used to provide an indication of the relative importance of small stream habitat within the study area.

Figure 4.4. Locations of Fish and Fish Habitat Surveys. Estimated of proposed new stream crossings are also indicated.



#### 4.5.1.1 Big Brook

##### Habitat Survey Information

Habitat surveys on Big Brook concluded that it provides excellent rearing habitat and some spawning substrate. There was an impassible obstruction identified in the upper section of Big Brook (Northland Associates 1986) however, it appears to be well upstream of the Amendment Area (Porter *et al.* 1974). Big Brook is estimated to contain a total of 400 units (1 unit = 100m<sup>2</sup>) of potential spawning habitat and 1,600 units of potential rearing habitat. Based on results of the 1985 surveys and information provided in Riche and Traverse (1971), the estimated spawning and rearing habitat in the Big Brook system accessible to anadromous salmon is approximately seven percent of the total available in the Main River watershed.

Figure 4.4 shows the approximate location of each quantitative sampling site in Big Brook. Site 2, located on the main stem of Big Brook had a mean width of 9.4m and a mean depth of less than 15cm. The substrate consisted of predominately cobble-gravel and there was negligible riparian habitat. Site 3 was located on a tributary of Big Brook with a width of 4.1m and a mean depth of 16.7cm. The substrate at the site consisted primarily of boulder-bedrock and riparian vegetation was recorded as extensive. Site 5 was also located on the main stem of Big Brook. The site had a width of 18m and a mean depth of 23cm. The substrate was primarily boulder-cobble and no riparian vegetation was recorded.

##### Salmonid Densities

Salmonid densities recorded from quantitative electrofishing surveys are presented in Table 4.2. Atlantic salmon were present in the main stem sampling sites of Big Brook but were not present in the small tributary (Site 3). Site 3 supported a low density of brook trout despite the absence of Atlantic salmon. No reason for this low fish density in the tributary was given by the surveyors, however, an aerial reconnaissance performed by the Department of Fisheries and Oceans circa 1970 reported that this stream had no apparent flow at that time (Porter *et al.* 1974). Therefore, this habitat may be subject to intermittent flows (Northland Associates 1986) even though it is not shown as such on the current 1:50,000 topographic map.

Table 4.2. Salmonid densities recorded from quantitative electrofishing surveys, Big Brook, 1985 (data adapted from Northland Associates 1986).

Site	Density (#/100m <sup>2</sup> )			Mean Biomass (g)			Standing Stock (g/100m <sup>2</sup> )		
	salmon		Trout	salmon		trout	salmon		trout
	Fry	parr		fry	parr		fry	parr	
2	52.3	33.9	2.8	0.6	4.8	30.2	31.4	162.7	84.6
3	0.0	0.0	11.1	--	--	9.4	--	--	104.3
5	0.0	25.6	5.6	--	11.0	1.9	--	281.6	10.6

#### 4.5.1.2 Tributary T2

##### Habitat Survey Information

Tributary T2 is located in the southeastern section of the proposed Main River Amendment Area (Figure 4.4). This tributary also provides excellent rearing habitat and some spawning habitat. There was an impassible barrier identified on T2, however, its exact location is not given (Northland Associates 1986). From a review of Porter *et al.* (1974), it appears that the obstruction is located on the tributary just before it enters the proposed Amendment Area (Figure 4.4). Tributary T2 is estimated to contain a total of 75 units of potential spawning habitat and 450 units of potential rearing habitat.

The total estimated spawning and rearing habitat accessible to anadromous salmon represented by T2 is 1.3% and 2.1% respectively (based on results of the 1985 surveys and information provided in Riche and Traverse 1971).

Figure 4.4 shows the approximate location of the quantitative sampling site in Tributary T2 (Site 4). The site was located on the tributary's main stem. Its width was 14.3m and its mean depth was 14cm. The substrate consisted of cobble-boulder and riparian vegetation was recorded as extensive.

##### Salmonid Densities

Tributary T2 had both Atlantic salmon and brook trout present at its sampling site (Table 4.3).

Table 4.3. Salmonid densities recorded from quantitative electrofishing surveys, 1985 (data adapted from Northland Associates 1986).

Site	Density (#/100m <sup>2</sup> )			Mean Biomass (g)			Standing Stock (g/100m <sup>2</sup> )		
	salmon		trout	salmon		trout	salmon		trout
	fry	parr		fry	parr		fry	parr	
4	73.2	45.0	4.3	0.6	3.3	7.8	41.7	148.5	33.5

In summary, fish species likely present at proposed stream crossings include brook trout and Atlantic salmon; Fish Habitat includes spawning and rearing, but is likely intermittent/reduced seasonally. There is no direct fishing likely in the immediate area of stream crossings, but the affected areas probably contribute to downstream fish stocks in the watershed.

#### 4.5.2 Fisheries

Both Atlantic salmon (*Salmo salar*) and brook trout (*Salvelinus fontinalis*) are found in the Main River system. The majority of fishing activity in the area is for Atlantic salmon in the first few kilometres of Main River. However, angling also occurs on the upper “fly in” sections of the river and, since the construction of the existing logging road, at the Paradise Pool area of the main stem. Historical and current angling effort on Main River are presented below in Table 4.4. No information was found with respect to recreational, subsistence, or commercial fishing near the areas of the proposed stream crossings.

Angling effort in Main River has generally been increasing since the early 1950’s with a likewise increase in total salmon caught (retained and released). The catch per unit effort has not changed significantly over the same time period ( $p < 0.01$ ), i.e., the increase in salmon caught is likely a result of increased angling effort as opposed to increased efficiency in capture.

Table 4.4. Angling records for the Main River, 1953-1999 (adapted from Porter *et al.* 1974 and information provided by Department of Fisheries and Oceans).

Year	Rod Days	Total Salmon Caught	CPUE
1953	17	11	0.65
1954	48	25	0.52
1957	4	2	0.50
1958	10	3	0.30
1959	40	5	0.13
1960	5	2	0.40
1961	110	24	0.22
1962	112	60	0.54
1963	164	89	0.54
1964 <sup>a</sup>	465	284	0.61
1965 <sup>a</sup>	666	542	0.81
1966 <sup>a</sup>	1350	931	0.69
1967 <sup>a</sup>	891	129	0.14
1968 <sup>a</sup>	771	644	0.84
1969 <sup>a</sup>	1585	726	0.46
1970 <sup>a</sup>	832	473	0.57
1971 <sup>a</sup>	713	414	0.58
1972 <sup>a</sup>	703	281	0.40
1973 <sup>a</sup>	669	692	1.03
1974	797	464	0.58
1975	1231	782	0.64
1976	1082	501	0.46
1977	1041	693	0.67
1978	616	252	0.41
1979	830	983	1.18
1980	916	1011	1.10
1981	1098	1277	1.16
1982	1848	1707	0.92
1983	1812	483	0.27
1984	723	302	0.42
1985	1051	599	0.57
1986	979	489	0.5
1987 <sup>b</sup>	438	230	0.53
1988	1204	988	0.82
1989	540	285	0.53
1990	1639	776	0.47
1991	1841	537	0.29
1992	1570	1032	0.66
1993	2150	2460	1.14
1994	3329	2759	0.83
1995	2246	1024	0.46
1996	1609	933	0.58
1997	N/a	1046	N/a
1998	N/a	1467	N/a
1999	N/a	1019	N/a

<sup>a</sup> angling data estimated to be 80% accurate

<sup>b</sup> bridge across Main River was constructed

## 4.6 TOURISM AND RECREATIONAL ACTIVITIES

As per the Guidelines require: ***“The description should include:***

***a description of the Tourism activities and recreational activities present in the area including the outfitter at Leslie Lake.”***

The following descriptive material is largely based on informal interviews with Tourism officials, commercial operations, and area residents. Where applicable, literature citations are noted.

### 4.6.1 FISHING

The Main River is a scheduled salmon river. Between 1953 and 1999, the number of salmon caught on the Main River steadily increased, reaching a peak in 1994 of 2,759 salmon. Since then, the number has fluctuated around the 1,000 mark. Brook trout are also found in the river, but since it is not a licensed activity, the number caught in any one season is difficult to determine.

As a result of woods roads and the bridge built across the river in 1987, access to the river has increased. One result has been a 50% increase in angling effort, from a 10 year average of 1,091 rod-days per year before 1986, to 1,657 rod-days since that date. Approximately 80% of the fishing effort occurs within the First 10-km of the river. The outfitter at Leslie Lake reports little recreational trout fishing in that lake. Recreational fishing is more likely to occur south of the Main River in the area known as Burnt Hill Lakes. Recreational fishing does occur at Sheffield Lake, but it is difficult to determine the number of fishers and the amount taken.

Many snowmobilers ice fish. However, the regulatory region does not provide a record of the numbers of ice fishers or the amount of fish caught.

### 4.6.2 HUNTING

Woods roads are commonly used as access points for hunting.

The Main River and Sheffield Lake Amendment Areas are located in Moose Management Areas 4 and 41 respectively. The number of licenses issued for these two areas have remained constant for moose and have slightly increased for caribou from 1999 to 2000. Outfitters on Leslie Lake report minimal big game hunting in that area other than what their clients hunt.

Ruffed grouse, Spruce grouse, willow ptarmigan, wood and black ducks and some Canadian geese, teal, and merganser are found near both the Main River and Sheffield Lake. The waterfowl-hunting season generally extends from the second week in September to the second week in December. Snowshoe hare are found throughout the area. Outfitters on Leslie Lake report minimal recreational small game hunting in their area other than what they hunt for themselves.

### 4.6.3 TRAPPING

Currently, a no-trapping (dry-land) policy exists in the Main River area. A submerged or drowning trap-set can be used, but given the current low market value of fur, and limited use of trap licenses, it is doubtful that anyone traps in the area.

### 4.6.4 TOURISM

To date, neither the Main River nor Sheffield Lake Amendment Area has been a tourist destination. Discussions with the staff at the Deer Lake tourist chalet (December 1997) indicated that their clients had not expressed any interest in visiting either area.

One operator has offered wilderness canoeing/kayaking trips on the Main River for twelve years, and rafting for five years. The majority of trips are one day between the Kruger Bridge, (which is two kilometres into the canyon section) and the mouth of the river at Sop's Arm. Occasionally, small groups are taken on a four to five day trip from the headwaters at Four Ponds Lake to the mouth at Sop's Arm. Although the river is not long, it contains a diversity of wilderness and canoeing experience from tundra-like barrens, through expanses of softwood forests, and through an unusual area of grass land called Big Steady. The river completes its journey through a spectacular 23km (14 mi.) canyon (Murphy et al. 1996).

One outfitter operates in the Main River Amendment Area. Roger Keough, owner of Parsons Pond Outfitters, has operated a hunting lodge on the southwestern corner of Leslie Lake since 1987. He has 22 moose licenses and 15 caribou licenses, and services an American (mid-Atlantic) clientele of between 20-25 hunters each year, about half of whom are repeat customers. He can accommodate four-six hunters at a time. His season runs from early September to late October with each customer participating in a seven-day hunt.

Since approximately 1995, snowmobiling has grown in popularity, especially on the Northern Peninsula. In 1996, the Department of Tourism, Recreation and Culture published a provincial snowmobile strategy. This strategy indicates that the most attractive part of the island for tourists is the Northern Peninsula and Gros Morne National Park area where snow conditions, as well as season length and uniqueness of natural scenery, are most appealing. Since then, the sport has been increasingly promoted, clubs have been formed, tours have become established and significant amounts of public funding have been directed towards this activity. As a result, in just four years, snowmobiling activity (both tourist and recreational) has tripled.

Several recently established snowmobile tourism companies (Extreme Back Country Adventures, Long Range Adventures, Frontier Cottages, Driftwood Inn, EDM, Sugar Hill Inn and Main River Lodge) operate out of the Sop's Arm/Deer Lake/ Gros Morne area. Some hunting and fishing outfitters have expanded their previous operations into snowmobiling, thereby achieving a longer operating season and, consequently, a more profitable operation. Tourists come primarily from Newfoundland, although out-of-province numbers are increasing steadily. Many tourists are employees or clients of oil



related or information technology companies who are participating in incentive travel packages.

The Main River is used as one of the primary access routes to the high country of Gros Morne National Park and vicinity. Snowmobilers come up through Leslie Lake, into the proposed Amendment Area, into Lynn's Brook down to the Big Steady on the Main River; travel up to Caribou Lake; on to Taylor's Book and subsequently into the high country of Gros Morne National Park. The woods roads also provide access to the backcountry and snowmobilers forecast that groomed trails will soon be operating throughout the area.

Although the snowmobiling season is from December until April, most activity occurs in March and April, when the days are warm, sunny and relatively windless. Weekends are the busiest times for snowmobiling when upwards of 200 machines travel between the high country of Gros Morne National Park to the West, Sop's Arm to the East and Deer Lake to the south.

#### **4.6.5 Recreation**

There are no cabins in the proposed Main River Amendment Area with the exception of the one owned by Parsons Pond Outfitters. The nearest cabins are located on the Eagle Mountain and Silver Mountain roads. Fifty-four cabins are located on Crown Land on the eastern portion of Sheffield Lake and another 46 lots are available from Crown Lands. Several cabins are also located on the western portion of the Lake.

Canoeing and Kayaking are popular recreational activities on Main River. Canoeing occurs during June, July and August between the Kruger Bridge and the mouth of the river at Sop's Arm. During June of each year, when the water is high, approximately 10-12 individuals kayak between the Kruger Bridge and the mouth of the Main River at Sop's Arm. Some canoeing occurs on Sheffield Lake by cabin owners.

Little hiking occurs in either Amendment Area, except that which relates to hunting, fishing and canoeing/kayaking.

#### **4.6.6 Parks**

The nearest park in the vicinity of the proposed Main River Amendment Area is a private park located in Sop's Arm. Consisting of a small picturesque campground with 25 campsites and a day use/picnic area, it is adjacent to the mouth of the Main River. The nearest provincial park to the proposed Main River Amendment Area is Sir Richard Squires Memorial Park located 47km northeast of Deer Lake. Gros Morne National Park is located approximately 30km to the west of the Main River Amendment Area. There are no municipal, provincial or national parks near Sheffield Lake.

Section 4.3 addresses the Main River Protected Area Corridor and the plans to have the area designated as a Waterways Park and a Canadian Heritage River.

## 4.7 FOREST STRUCTURE

As per the Guidelines: ***“The description should include:***

***a description of the forest structure of the area within the undertaking with special emphasis on the undisturbed, old growth forest of the Main River region. The description should include:***

- ***the area of contiguous undisturbed, old growth forest remaining in District 16; and***
- ***an estimate of the proportion of the remaining undisturbed, old growth forest that this might represent for the island of Newfoundland.”***

### 4.7.1 Main River Amendment Area

Based on forest inventory data supplied by the Department of Forest Resources and Agrifoods, the forest structure of the Main River Amendment Area is characterized in Table 4.5. In general, approximately 1,441 hectares (~61%) of the Amendment Area is softwood. Of that, 1,429 hectares (over 99%) is of an age class to be considered merchantable (greater than 80 years old).

While the majority of the softwood in the Main River Amendment Area is classified as greater than 120 years old in the forest inventory database, the forest structure in the Main River watershed and surrounding area does not appear to be typical of most of the Island. Insular Newfoundland's forests are generally regenerated due to an insect/fire cycle whereby large-scale disturbances occur which create very large openings and allow large forested areas of relatively even-age to develop (J. McCarthy pers. comm.). The frequency of these disturbances varies but based on the forest inventory age classes, is probably less than 120 years. The frequency of disturbance in the Main River area is unknown (J. McCarthy pers. comm.).

The forest structure in the Main River area is best described as a 'Gap Replacement' forest, hence this more accurate term (rather than "old growth") is used in discussing the forest structure of the Main River region. This term "Gap Replacement" refers to a process whereby the death of an individual tree or of a very small number of trees, creates small openings (gaps) in the forest canopy. One theory is that such trees are killed by wood-rotting fungi (J. McCarthy pers. comm.). These gaps allow smaller trees, which may already be over 100 years old, to grow up into the openings. Once released, the trees assume good growth rates with the result being an uneven-aged forest but relatively even-sized canopy over a fairly large area.

The time between large-scale disturbances in areas of the Northern Peninsula appears to be much longer than for other regions of the Island. As a result, some Balsam Fir trees on the Northern Peninsula have been aged at greater than 200 years old (J. McCarthy pers. comm.). The oldest live Balsam Fir tree recorded so far in Mr. McCarthy's work is 252 years.

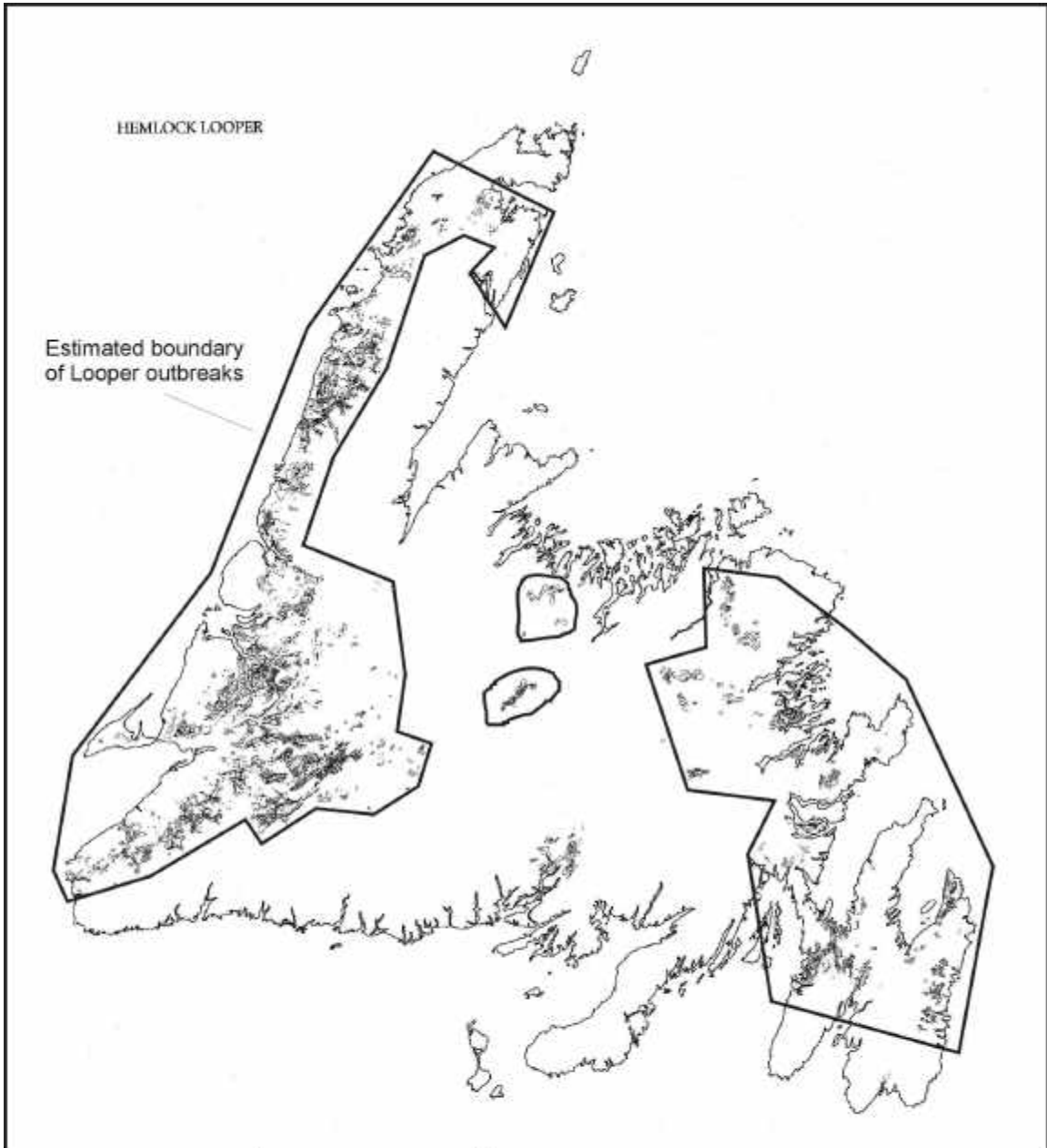
Table 4.5. Total area of each forest classification of the Main River Amendment Area (based on forest inventory data).

<b>Stand Type/Feature</b>	<b>Age Class (years)</b>	<b>Area (Hectares)</b>
Balsam Fir (bF)	0-20	12.2
Balsam Fir (bF)	81-100	16.6
Balsam Fir (bF)	101-120	342.3
Balsam Fir (bF)	121+	704.3
Black Spruce (bS)	101-120	40.1
Black Spruce (bS)	121+	269.5
Hardwood Dominated with some Softwood (sH)	101-120	5.2
Hardwood Dominated with some Softwood (sH)	121+	50.1
All Hardwoods	N/A	28.5
Disturbed (cut-over, insect, Fire, blowdown)	N/A	115.7
Softwood Scrub	N/A	663.8
Hardwood Scrub	N/A	2.9
Bog	N/A	65
Treed Bog	N/A	23.8
Cleared Land (gravel pits, agriculture)	N/A	0.6
Lakes and Ponds	N/A	23.3
Rivers	N/A	1.9
Total area	N/A	2,366.8

The gap replacement process occurs in all forests to some degree (G. VanDusen pers. comm.). Provincial Forest Resource and Agrifoods staff have observed a similar forest structure in Labrador in areas where fire disturbance is absent (D. Harris pers. comm.).

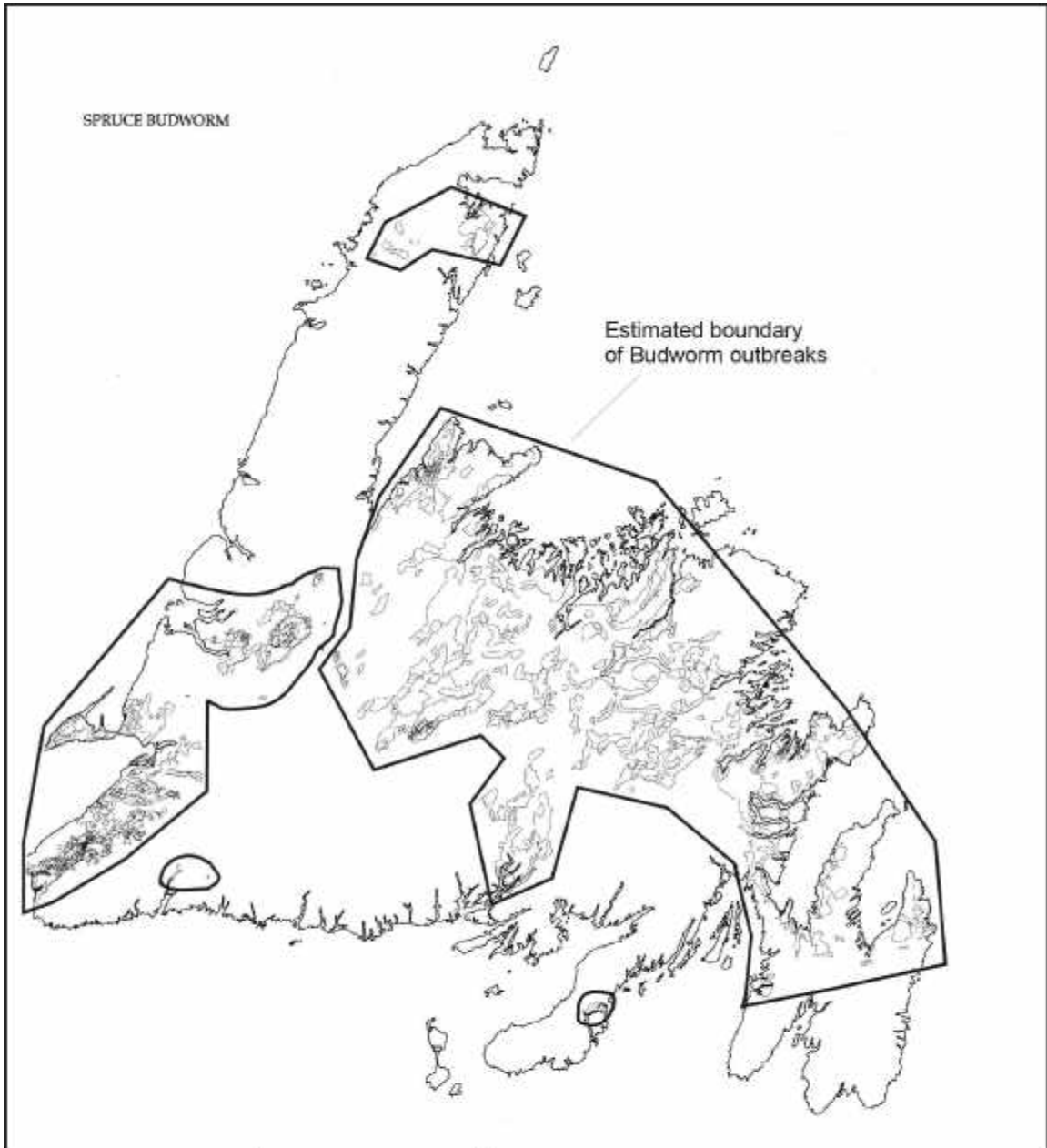
Figures 4.5 and 4.6 show the historical insect damage for Insular Newfoundland. While the forests on the western and northern portions of the Northern Peninsula are susceptible to insect disturbance, a large portion of the eastern side of the Peninsula (approximately from Cloud River to Main River) has been free of large scale insect damage.

Figure 4.5. Historical Hemlock Looper Outbreak Locations in Newfoundland (1983-1999).



Reproduced from maps produced by DFRA.		<b>CBPP</b>			
DRAWN LWM	PROJECT Main River/east Sheffield Lake Amendment EPR				
CHECKED JHM	DRAWING Historical Hemlock Looper Outbreak Locations Newfoundland (1983-1999)				
FILE NO. TF07102	SCALE	DATE 00/03/30	DWG. NO. FIGURE 4.5	REV.	

Figure 4.6. Historical Spruce Budworm Outbreak Locations in Newfoundland (1980-1992)



Reproduced from maps produced by DFRA.		<b>CBPP</b>			
		<b>AGRA Earth &amp; Environmental</b>			
DRAWN	LWM	PROJECT	Main River/east Sheffield Lake Amendment EPR		
CHECKED	JHM	DRAWING	Historical Spruce Budworm Outbreak Locations Newfoundland (1980-1992)		
FILENO.	TF07102	SCALE	DATE	DWG. NO.	REV.
			00/03/30	FIGURE 4.6	

In addition, there is very little fire history within this Ecoregion (Meades and Moores 1994). Within the island of Newfoundland there are few areas which have experienced a long time lapse between large-scale disturbances, and hence had the opportunity to develop into mature Gap Replacement forests. While there is insufficient data available to quantify such areas for the entire province, a minimal estimate is that a boundary of approximately 4,800km<sup>2</sup> has the capacity to support Gap Replacement forest on the eastern side of the Northern Peninsula.

Timber cruising by the provincial Department of Forest Resources and Agrifoods occurs at pre-determined (Permanent Sampling Plot) and random (Temporary Sampling Plot) sites throughout the entire Island. The aging of a sample of trees within each plot is included in the information collected. The information from the temporary sampling plots has been used to estimate the extent of Gap Replacement forest in FMD 16. Since Permanent Sampling Plots age only two trees per plot, they were not used. Figure 4.7 shows map sections in FMD 16 used by Forest Resources and Agrifoods along the Northern Peninsula where tree age data was collected from Temporary Sampling Plots (TSPs). It also indicates the locations where trees have been sampled which were determined to be greater than 150 years old. This age was used since it is older than the oldest stand age identified by the forest inventory database, i.e.120 years, and hence a possible area of low natural disturbance. Figure 4.7 indicates where sampled trees were greater than 150 years old in FMD 16. Table 4.6 summarizes the age data for each map section sampled.

From the above available data, a conservative estimate of the boundary of the Gap Replacement forest structure in FMD 16 is an area of approximately 1,500km<sup>2</sup> which includes the entire District north of the Main River Protected Area Corridor inclusively (Figure 4.8). A more detailed consideration of the forest ecosystem is discussed in Section 5.4.3.

The Department of Forest Resource and Agrifoods has been reviewing their available data in order to determine the extent of this forest structure and its relationship to the environment of the Northern Peninsula. To date, the results are preliminary, however, conversations with Forest Resources and Agrifoods personnel indicate that the forest structure extends well beyond the boundary of the Main River watershed and includes the eastern side of the Northern Peninsula (D. Harris pers. comm.).

The portion of FMD 16 identified as containing the Gap Replacement forest structure is approximately 30-35% of that area of the eastern Northern Peninsula identified above. The Amendment Area contains approximately 7% of the Gap Replacement forest structure in FMD 16.

Figure 4.7. Map Sections where TSPs have been conducted by DFRA. Also shows these sections broken down by 150+ trees or not.

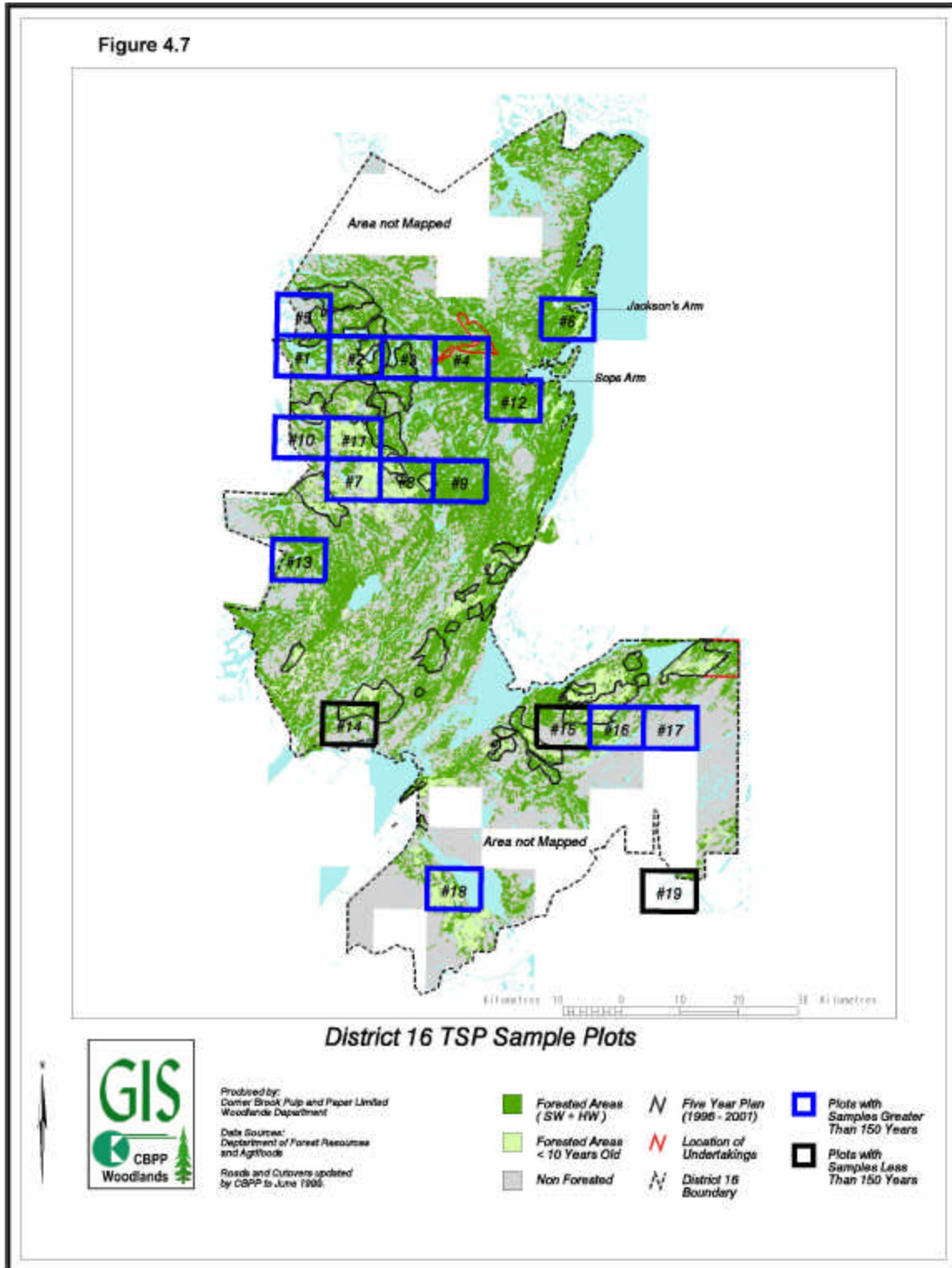


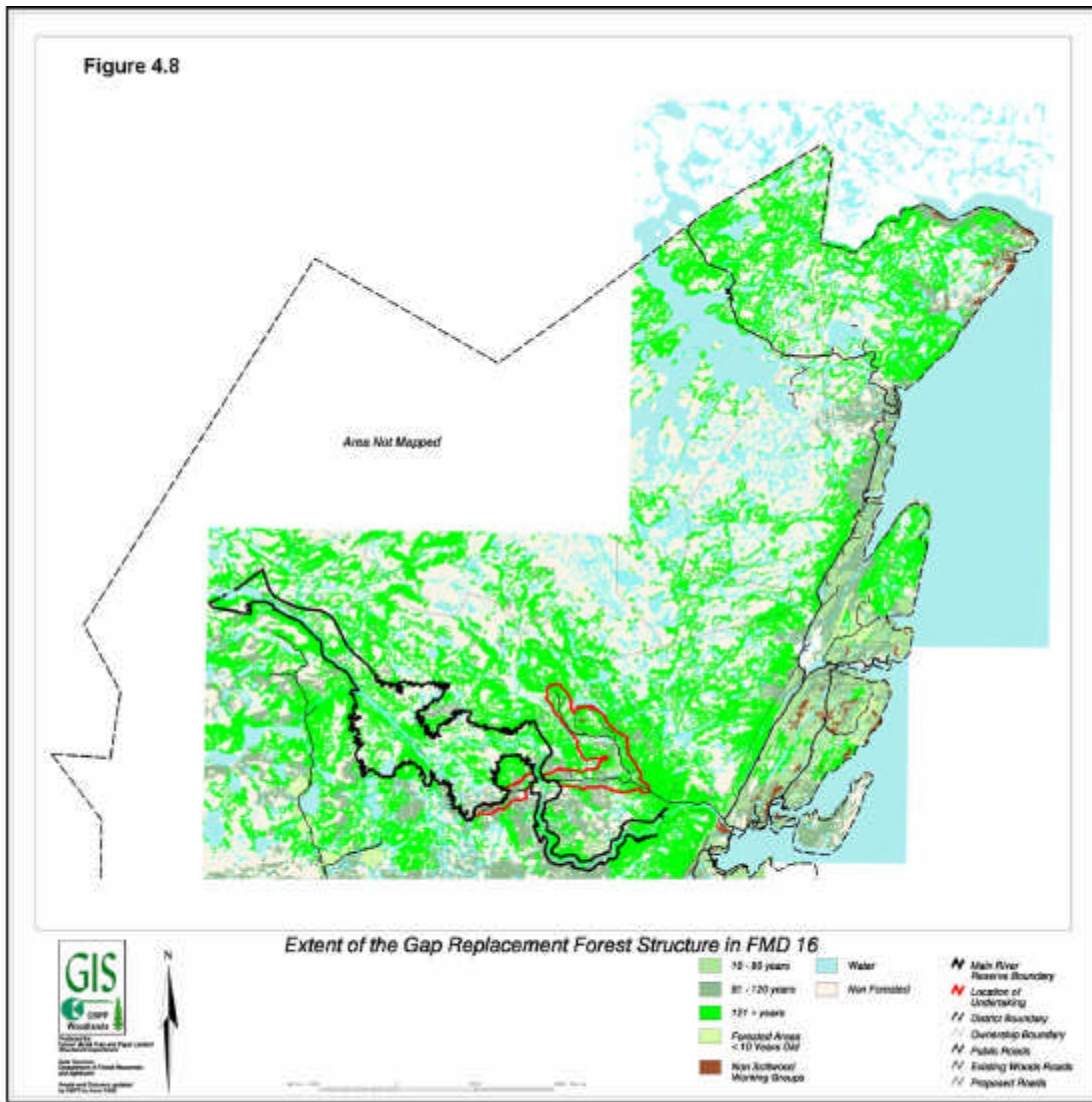
Table 4.6. Summary age data for TSPs in FMD 16. The First column corresponds to the block numbers in Figure 4.7.

Figure 4.7 ID number	Map ID Number	Total Trees Sampled	Trees over 150 years old	Maximum age in Map Section
1	03211	96	29	218
2	03212	65	15	232
3	03213	98	11	177
4	03214	16	1	150
5	03221	95	10	200
6	03322	27	4	171
7	04022	80	26	180
8	04023	76	25	192
9	04024	76	28	206
10	04031	58	8	217
11	04032	112	23	198
12	04141	6	4	184
13	05041	113	17	184
14	06042	3	0	120
15	06142	3	0	106
16	06143	48	7	171
17	06144	20	6	169
18	07244	9	1	165
19	07344	11	0	114

While there is no research currently published on the Gap Replacement forest structure found on the eastern side of the Peninsula, a doctoral research project is ongoing on the structure and disturbance dynamics of these forests (J. McCarthy, pers. comm.). Sampling by Mr. McCarthy to date has been in the Main River watershed around the northwest area, along the forest access road built by CBPP.



Figure 4.8. Map of northern portion of FMD 16 (potential gap replacement forest).



### 4.7.2 East Sheffield Lake Amendment Area

The East Sheffield Lake Amendment Area is not considered within the boundary of the Gap Replacement forest. Table 4.7 presents the forest structure of this Amendment Area. In general, approximately 1,206 hectares (~47%) of the Amendment Area is softwood. Of that, 797 hectares (~66%) is of an age class to be considered merchantable (greater than 80 years old).

Table 4.7. Total area of each forest classification of the East Sheffield Lake Amendment Area (based on forest inventory data).

<b>Stand Type/Feature</b>	<b>Age Class (years)</b>	<b>Area (Hectares)</b>
Balsam Fir (bF)	0-20	243.5
Balsam Fir (bF)	21-40	125.5
Balsam Fir (bF)	81-100	4.5
Balsam Fir (bF)	101-120	7.3
Black Spruce (bS)	0-20	28.5
Black Spruce (bS)	21-40	7.2
Black Spruce (bS)	41-60	1.0
Black Spruce (bS)	61-80	3.6
Black Spruce (bS)	81-100	545.5
Black Spruce (bS)	101-120	238.8
Hardwood Dominated with some Softwood (sH)	81-100	1.5
All Hardwoods	N/A	0.0
Disturbed (cut-over, insect, Fire, blowdown)	N/A	3.5
Not Stocked	N/A	10.9
Softwood Scrub	N/A	815.1
Hardwood Scrub	N/A	3.0
Bog	N/A	255.8
Wet Bog	N/A	10.6
Treed Bog	N/A	1.5
Soil Barren	N/A	14.4
Lakes and Ponds	N/A	244.1
Rivers	N/A	2.9
Total area	N/A	2568.7

## 4.8 MIGRATORY BIRDS

As per the Guidelines: ***“The description should include:***

***a description of the migratory bird species which occur within the area of the undertaking.”***

While specific information regarding the migratory bird species that occur within the undertaking is not available, waterfowl studies have been conducted on the main stem of the Main River (Northland Associates 1986). The information provided by this document and others, such as the Management Plan for Main River as a Canadian Heritage River (Parks and Natural Areas 1998) and the Harlequin Duck/waterfowl Technical Report for the Upper Humber River (AGRA 1997b), suggest that Canada Goose, Black Duck, Green-winged Teal, Scaup and possibly Ring-necked Ducks would be most likely to utilize the habitat available in the proposed Main River Amendment Area.

While specific information and/or survey results are not available for the proposed East Sheffield Lake Amendment Area, similar migratory bird habitat exists. Therefore, the same species identified above would be expected to occur there.

Detailed information on surveys of migratory birds within the Main River/Upper Humber area is presented below.

### 4.8.1 Main River

As part of the Upper Humber/Main River Wood Harvesting Operations Environmental Impact Statement, waterfowl studies were conducted on the main stem of the Main River (Northland Associates 1986). A review of literature, Helicopter surveys, and ground field trips were conducted to gather information regarding the species and numbers present within the study area. Helicopter surveys were conducted on May 31, June 5-9, June 25-28, and September 10-13, 1985. Ground surveys were conducted on the above dates except May 31. The proposed Amendment Area was not specifically surveyed however, general species presence can be inferred from a comparison of the survey results and the habitat located within the Amendment Area. It should be cautioned, however, that due to the recognized importance of Big Steady as waterfowl habitat, the specific data related to this area (i.e., densities of waterfowl, breeding success, and sensitivity of the habitat) cannot be extrapolated to describe the general area (Northland Associates 1986).

Big Steady contains approximately 200ha of suitable waterfowl habitat including waterways, riparian meadowland, peat land, and wet fir forest which has been identified as very good waterfowl habitat by Newfoundland standards (Northland Associates 1986). The species identified along the main stem of the river were: Canada Goose (*Branta canadensis*), Black duck (*Anas rubripes*), Green-winged teal (*Anas crecca*), Blue-winged teal (*Anas discors*), Ring-necked duck (*Aythya collaris*), Common Goldeneye (*Bucephala clangula*), Red-Breasted Merganser (*Mergus serrator*), and Common Merganser (*Mergus merganser*). All of the species identified above, except Blue-winged teal, were also identified in the area during the Summer months by a

Canadian Wildlife Service researcher (Northland Associates 1986). The species composition described above is comparable to the species identified during surveys conducted in the Silver Mountain area during the Spring and Summer of 1997 (AGRA 1997b). The exception being Scaup (*Aythya marilla*) which were identified using a small pond in the Silver Mountain area. This species was identified in 1986 as one that was thought to be expanding its range in the western portion of the Island (Northland Associates 1986). It will therefore be included in the list of species potentially using the proposed Amendment Area.

Within the Main River Amendment Area, there are approximately sixteen small ponds (shown on the 1:50,000 topographic map). Table 4.5 shows that there are approximately 25ha of lakes, ponds, and flowing water within the Amendment Area. Big Steady on Main River is approximately 10 km west of the Amendment Area. The grasslands at Big Steady are major concentration areas for waterfowl and it would therefore be reasonable to assume that waterfowl which can utilize small ponds and marshes may be attracted to this general area and would likely be present to some degree within the Amendment Area.

Of the species identified above, Canada Goose, Black Duck, Green-winged Teal, Scaup and possibly Ring-necked Ducks would be most likely to utilize the habitat available in the Amendment Area.

#### **4.8.2 East Sheffield Lake Amendment Area**

The East Sheffield Lake Amendment Area contains at least 75 waterbodies of various size. Table 4.7 shows that the East Sheffield Lake Amendment Area contains approximately 259ha of wet bog, lakes, ponds, and flowing water.

Similarly to the Main River Amendment Area, of the species identified above, Canada Goose, Black Duck, Green-winged Teal, Scaup and possibly Ring-necked Ducks would be most likely to utilize the habitat available in this Amendment Area.

## 4.9 OTHER WILDLIFE

As per the Guidelines: ***“The description should include:***

***a description of other wildlife, such as owls, caribou, and forest birds.”***

For the purposes of this EPR, raptors (owls), caribou, non-consumptive avifauna (forest birds), moose, upland game, and furbearers have been described as the wildlife potentially within the Amendment Areas.

### 4.9.1 Raptors (Owls)

Raptors identified during previous surveys in the Main River area have been Bald Eagles (*Haliaeetus leucocephalus*) and Osprey (*Pandion haliaetus*). In addition to these species, Northern Goshawk (*Accipiter gentilis*), American Kestrel (*Falco sparverius*), Merlin (*Falco columbarius*), Rough-legged Hawk (*Buteo lagopus*), Northern Harrier (*Circus cyaneus*), and Northern Hawk Owl (*Surnia ulula*) have been identified in the Upper Humber area (AGRA 1997b). These raptors and owls could be expected to utilize the Amendment Areas.

### 4.9.2 Caribou

Several studies have been conducted over the years on the caribou (*Rangifer tarandus*) herds on the Northern Peninsula. The results of available reports are compiled here in order to give a consolidation of known, accessible information and a large-scale picture of caribou population changes and movement patterns/habitat use on the Northern Peninsula and in the area of the proposed amendments.

#### 4.9.2.1 Populations

The caribou on the Northern Peninsula were investigated in 1966-67 as part of a report to inventory the wildlife within the proposed boundaries of Gros Morne National Park (Pruitt 1967). Pruitt described three, apparently separate, caribou herds: the Gregory Plateau, the Humber River, and the Northern Peninsula.

Bergerud (1971) estimated the number of caribou in insular Newfoundland during the period 1900-1910 to have been approximately 40,000 animals. From 1915-1925, caribou numbers apparently declined rapidly and only 1,000 to 2,000 animals persisted on the island during this time. There were probably fewer than 100 animals remaining in each of the Northern Peninsula and Humber River herds in 1930 (Bergerud 1971). The herds began to increase again by 1932-35, however, Bergerud determined that the Humber River herd showed no change in numbers between 1956-64 and that it averaged only 111 animals throughout this time. Likewise, there was no detectable increase in numbers for the Northern Peninsula herd in the two aerial censuses made in 1958 (450 animals) and 1966 (400 animals). By 1986, the Humber Herd was estimated to contain between 300 and 400 animals and the Northern Peninsula Herd was estimated between 1,000 and 2,000 animals (Northland Associates 1986). In 1993, a

complete census of caribou within the Park boundary during the post-calving period produced an estimate of 1,500 adults (C. McCarthy, pers. comm.).

Recent population counts conducted by the Wildlife Division of the provincial Department of Forest Resources and Agri-foods have been based on Management Areas rather than specific herds. Management Areas near the proposed Main River Amendment Area are 69 (Northern Peninsula) and 79 (Adies Lake). Management Areas near the proposed Sheffield Lake Amendment Area are 78 (Hampden Downs) and 66 (Gaff Topsails). The last date that these Areas were flown, the caribou estimates in each Area, and the latest number of hunting licenses issued for each Area are provided in Table 4.8. Conversations with Wildlife personnel indicate that surveys conducted by them have not been completed in any particular season or at any standard date between years, therefore an estimate of individual herd size is not possible (C. Doucette pers. comm.). Conversations also indicate that caribou numbers in the area have been increasing but are starting to level off. License increases in the Management Areas reflect a general increase in population density (C. Doucette pers. comm.).

Table 4.8. Summary information of Caribou Management Areas near the proposed Amendments.

Management Area	Date Last Surveyed	Estimated Caribou in Area	1999 Licenses Issued	2000 Licenses to be Issued
66	1989	4,500	350	370
79	1998	4,000	250	250
69	1996	8,500 <sup>a</sup>	450	490
78	1989	600	100	100
Gros Morne	1993	1,500	N/A	N/A

<sup>a</sup> This survey may have been of the entire Peninsula.

#### 4.9.2.2 Ranges and Movements

The Summer range of the Humber River herd pre-1967 was described by Pruitt as that area of the Long Range and Eastern Hills regions between Western Brook Pond, Silver Mountain and north to include the watershed of Main River (Pruitt 1967). Pruitt went on to describe the Winter range of this herd as the Humber Valley between Aides River, Sandy Lake and the CN railway tracks. The calving grounds were unknown at that time. He also indicated that the Humber River herd moved predominantly north and south while the Northern Peninsula herd moved predominantly east-west along the eastern slopes of the Long Range and the Cat Arm River and its watershed (Pruitt 1967).

The Upper Humber Valley was also described by Pruitt as an area of exceptional snow fall, with snow up to 3 m (10 ft) deep. He also stated that the Humber River herd would have a low chance of over-wintering west of a line boundary drawn from Bonne Bay Big Pond in the south to Eagle Mountain in the north (Pruitt referred to this line as the St. Barbe Boundary). Caribou wintering west of this line would be confined to alpine domes or windswept bogs, with occasional forays into intervening forests. Winter snow cover

was described as well beyond the caribou's tolerance for digging feeding craters in the forest (Pruitt 1967).

In 1986, the Humber Herd was described as occupying a restricted range at the base of the Peninsula. The Northern Peninsula Herd was said to range from Roddickton Road in the north to Adies Pond in the south, and from White Bay to the western edge of the Long Range Mountains (Northland Associates 1986; MacLaren Plansearch 1982). It was also stated that these herds intermingled to an unknown extent in Gros Morne National Park and in the Adies Pond area.

In the Upper Humber/Main River Wood Harvesting Operations Environmental Impact Statement, it was stated that the Humber Herd calved in Gros Morne National Park and over-wintered to the north-east of Adies Pond (Northland 1980; Bateman 1980), however, in 1980 an expansion eastward across Highway 420 (Hampden Highway) was identified. The seasonal movement from Gros Morne to Adies Pond and back was in an east-west direction, with little divergence to the north or south. Animals were found in their wintering range between November and late April.

The major Winter concentrations of the Northern Peninsula Herd were located on the barrens on the western edge of the Long Range Mountains (Northland 1980). Small groups of animals from this herd were also found over-wintering in the central, eastern, and northern parts of the Peninsula (Slaney 1979; Shawmont 1980).

Animals of the Northern Peninsula Herd begin moving from their over-wintering range to their calving areas in May. Two major calving areas were identified in 1980 (Northland 1980); one on the high barrens north of Parsons Pond and another approximately 20km east of Portland Creek Pond. The Big Level area of Gros Morne National Park has since been identified by park biologists as the main calving ground for the majority of caribou on the Northern Peninsula, and the peak calving period is between May 20 and the First of June (C. McCarthy pers. comm.).

By June, and continuing through the Summer, caribou move from the calving grounds onto the bogs and fens in the centre of the peninsula to take advantage of the new vegetation growth. During this period, some animals moved into the lowlands near the southern end of Big Steady, perhaps using the cooler timber stands to escape the heat and biting flies (Northland Associates 1986). By late October, most of these caribou are again heading toward their Winter range at the western edge of the mountains. A radio-telemetry tracking study of 15 caribou carried out in 1981 (MacLaren Plansearch 1982) found similar patterns of seasonal movement. Recent radio-collaring of caribou which had calved in Gros Morne has indicated that after calving, a portion of the animals migrate out of the Park and some move out on to the coastal plains within the Park boundary (B. MacLaren pers. comm.). Mr. MacLaren also indicated that most caribou that move east of the park generally utilize the habitat west of Main River.

### **4.9.3 Moose**

Recent population counts conducted by the Wildlife Division of the provincial Department of Forest Resources and Agrifoods have been conducted on Management Areas near the proposed Amendment Areas. The Main River Amendment Area is within Area 4 (Taylor's Brook) and the East Sheffield Lake Amendment Area is within Area 41

(Sheffield Lake). The last date that these Areas were flown, the moose estimates in each Area, and the number of hunting licenses issued for each is provided in Table 4.9. Conversations with Wildlife personnel indicate that moose numbers in the area have generally been increasing but are starting to level off. License numbers in the Moose Management Areas reflect a general leveling-off in population density (C. Doucette pers. comm.).

Table 4.9. Summary information of Moose Management Areas near the proposed Amendments.

Management Area	Date Last Surveyed	Estimated Moose in Area	1999 Licenses Issued	2000 Licenses to be Issued
4	1997	5,000	1,200	1,200
41	1997	2,000	500	500

Moose Management Area 4 is considered to be a relatively good area for moose production with a population that is stable or increasing in number (B. MacLaren pers. comm.). There were a total of 121 survey blocks flown in 1997. Of those blocks, five were located within the proposed Main River Amendment Area. The total number of moose seen in these five blocks was one. The 1997 surveys indicated that the majority of the moose seen were in the southern and western parts of the Management Area (B. MacLaren pers. comm.).

Overall, low moose counts were observed in 1997. The total number of moose seen for all 121 blocks in Area 4 was 348. These low counts may have been the result of many factors; some of which may have been weather and observer experience (B. MacLaren pers. comm.). However, the relatively low number of moose seen in and around the proposed Main River Amendment Area compared to other locations in Moose Management Area 4 is a reflection of the animals positive response to wood harvesting (B. MacLaren pers. comm.).

#### 4.9.4 Upland Game

Upland game considered important around the proposed Amendment Areas from a socio-economic and prey-base viewpoint are Snowshoe Hare (*Lepus americanus*), Arctic Hare (*Lepus arcticus*), Willow ptarmigan (*Lagopus lagopus*), Ruffed Grouse (*Bonasa umbellus*), and Spruce Grouse (*Dendragapus canadensis*).

Ruffed Grouse were successfully introduced into the Hawkes Bay area in the 1960's. Both ruffed and Spruce grouse inhabit conifer forests in various stages of successional growth. Therefore, both species are probably present within the proposed Amendment Areas.

Willow ptarmigan (*Lagopus lagopus*) are fairly common in cut-over areas. Like the Snowshoe Hare, it prefers areas of early successional growth. Ptarmigan will move to slopes of mountains, particularly in Spring and Summer, such as those along the



western slopes of the Long Range Mountains. These species, if located within the proposed Amendment Areas, would be expected to be in low densities.

Arctic Hare (*Lepus arcticus*) occur on the barren upland regions along the eastern boundary of Gros Morne Park (Pruitt 1967). The species is not expected to be present within either of the proposed Amendment Areas.

During periods of cyclic abundance, populations of upland game can build to very high numbers. The early successional stages of vegetation resulting from clear-cutting or road right-of-way clearing are favoured feeding areas for hares, ptarmigan and ruffed grouse. Ptarmigan are especially capable of forming considerable winter concentrations in such habitats, particularly if willow (*Salix* spp.) is present (Northland Associates 1986).

#### 4.9.5 Furbearers

All species of furbearers present on the Island may occur within the proposed Amendment Areas.

These include:

- Red Squirrel (*Tamiasciurus hudsonicus*)
- Beaver (*Castor canadensis*)
- Muskrat (*Onychomys leucogaster*)
- Red Fox (*Vulpes vulpes*)
- Ermine (*Mustela erminea*)
- Mink (*Mustela vison*)
- Otter (*Lontra canadensis*)
- Lynx (*Lynx canadensis*)
- Black Bear (*Ursus americanus*)

River and stream banks, forests and forest edges represent the preferred habitat for most furbearers (Northland Associates 1986), and such habitat exists within both proposed Amendment Areas. Also, small and medium-sized mammals and game birds (mice, hares, ptarmigan and grouse) represent a basic part of the diet of predatory furbearers, and some of these prey species probably occur within the proposed Amendment Areas. Data on the population levels of furbearer species within the proposed Amendment Areas are unavailable.

#### 4.9.6 Non-Consumptive Avifauna (Forest Birds)

In addition to upland game, various riparian and inland songbirds have been identified in the Upper Main River Forest Landscape Design Report (CBPP 1998) as being in the Main River area. These are:

##### Riparian songbirds

- Common snipe (*Gallinago gallinago*)
- Waterthrush (*Seiurus noveboracensis*)
- Sandpiper (*Actitis macularia*)
- Greater Yellowlegs (*Tringa melanoleuca*)
- Kingfisher (*Ceryle alcyon*)

- Lincoln Sparrow (*Melospiza lincolni*)
- Tree Swallow (*Tachycineta bicolor*)

#### Inland Songbirds

- Myrtle warbler (*Dendroica coronata*)
- Goldfinch (*Carduelis tristis*)
- Kinglet (*Regulus satrapa*)
- Pine Siskin (*Carduelis pinus*)
- Chickadees (*Parus atricapillus* and *Parus hudsonicus*)
- Downy Woodpecker (*Picoides pubescens*)
- Evening Grosbeak (*Coccothraustes vespertinus*)
- Pine Grosbeak (*Pinicola enucleator*)
- Purple Finch (*Cardodacus purpureus*)
- Redpoll (*Carduelis flammea*)
- Hermit Thrush (*Catharus guttatus*)
- Redstart (*Setophaga ruticilla*)
- Junco (*Junco hyemalis*)
- Ovenbird (*Seiurus aurocapillus*)

It is reasonable to assume that these species are common in the boreal forests in and around the proposed Amendment Areas.

#### 4.10 PRESENT AND KNOWN FUTURE RESOURCE USE(S)

As per the Guidelines: ***“A qualitative and quantitative description of the present and known future resource use(s) and identification of known data gaps is essential.”***

In order to ensure that this requirement is met, the following table is included which summarizes the present and “known” future resource use(s) and identifies known data gaps. Where present resource use is described in other sections, they are referenced.

Table 4.10 Present and known future resource uses and known data gaps.

Issue	Description of Resource Use(s)		Data Gaps
	Present	Future	
Marten	Section 4.2 (protected)	Will remain protected	Utilization of the Amendment Areas is not documented
CHRS	Nominated	Will become a CHR	None Identified
Navigation	Section 4.4 (not navigable)	Will remain un-navigable	Survey data at each crossing is required for permits.
Fish	Brook trout Atlantic salmon	Brook Trout Atlantic salmon	Surveys at crossing locations may be required for permits.
Fish Habitat	Utilized by species present	Utilized by species present	Habitat survey data at each crossing is required for permits.
Fisheries	Not-utilized	Under-utilized	No angling data from Amendment Areas.
Tourism	One outfitter in Main River Amendment Area	No outfitter increase likely; Ecotourism increase likely on main stem of Main River	None Identified.
Forest Structure	“Gap Replacement” in Main River Amendment Area	Regeneration to younger “Gap Replacement” forest	Distribution of gap replacement forest in Main River region, District 16, and throughout Newfoundland
Migratory Birds	Section 4.8 Some species present	Some species present	Survey data from within the proposed Amendment Areas
Other Wildlife	Section 4.9 some species present	Some species present	Site specific surveys on species present and habitat utilization in Amendment Areas

## 5.0 IMPACT ASSESSMENT

As per the Guidelines:

***“The EPR should provide an analysis of the potential biophysical and socioeconomic effects. Potential effects (positive and negative, short and long term, direct and indirect) must be defined qualitatively and quantitatively. Effects predictions must be explicitly stated and the theory or rationale upon which they are based must be presented. For example, environmental effects should be defined and discussed in the following context: significance, nature and magnitude, spatial extent, frequency, probability, duration and level of knowledge.***

***Environmental effects should focus on but not be limited to addressing the environmental components listed in Section 4.0.”***

In addition to identifying the potential effects, this section also identifies the mitigative measures, rehabilitation plans, residual effects, and monitoring as per the Guidelines:

***“Mitigative measures and their effectiveness proposed to minimize or eliminate negative effects or enhance positive effects must be described and discussed. The discussion should include, but not be limited to, the establishment of undisturbed buffer zones which will be maintained around all waterbodies including Big Brook. In addition to those components outlined in Section 4.0, proposed mitigative measures for the protection of fish and fish habitat should be addressed.”***

***“A description of rehabilitation plans intended for the undertaking which are being considered must be described. The proponent should identify the need for monitoring programs and commit to any ongoing monitoring programs. As a minimum, the proponent should address the current pine marten study in terms of its participation and support in the study and provide details on how the current study or any future activities being considered will affect the study”***

***“Residual effects or those which remain after mitigative measures have been implemented must be defined in terms of significance, nature, magnitude, spatial extent, probability, duration and frequency. Irreversible impacts must be clearly identified”***

## 5.1 ASSESSMENT PROCEDURE

Assessment of the potential impacts of each phase of the undertaking involved three steps:

- preparation of interaction matrices (level 1);
- identification and evaluation of potential impacts; and
- description of mitigation measures and identification of any predicted residual impacts.

### 5.1.1 Preparation of Interaction Matrices

Level 1 interaction matrices were prepared for construction (right-of-way and road construction), operation (forest harvesting), and revegetation/silviculture components of the undertaking. A level 1 matrix identifies all possible activities associated with the undertaking, which could interact with any of the identified Valued Environmental Components (VECs). These matrices are only used to identify potential interactions and, therefore do not make assumptions about the potential effects of the interactions.

### 5.1.2 Identification and Evaluation of Impacts

Interactions identified in the Level 1 matrices were evaluated for their potential to cause effects. An interaction was considered to be a potential impact on a VEC if it could change abundance or distribution, change the prey species or habitats used by species of concern, or affect resource user activities. Impact predictions followed three general steps as outlined below:

- determine whether a potential environmental effect is adverse;
- determine whether an environmental effect is significant (as defined by impact significance criteria discussed in Section 5.1.5); and
- determine whether a significant adverse environmental effect is likely to occur.

Any potential impacts that were deemed impossible or extremely remote were not considered further. In this way, the assessment could focus on key issues and the more significant environmental concerns specified in the Guidelines and identified through public comments.

In addition to describing the nature of the impact, the evaluation employs a numerical rating system to indicate the magnitude, duration, geographical extent and probable frequency of occurrence of expected interactions.

The significance of the effects of the undertaking on each identified VEC was evaluated based on a review of relevant literature, consultation with experts and professional judgement of the study team. In some instances, impact predictions were made more difficult due to limitations on data from within the Amendment Areas. Ratings are therefore provided to indicate the level of confidence associated with each impact prediction.

The impact analysis generally followed the following format:

- Consider potential (project-environment) interactions associated with identified issues from the Guidelines or from public comments;
- issues and concerns – a statement of major concerns expressed or hypotheses stated regarding the effects of a project activity on a VEC;
- existing knowledge – a review of current knowledge concerning the sensitivity of each VEC to a project activity; and
- impact prediction – an assessment of potential impacts associated with each project activity rated against significance criteria.

### **5.1.3 Description of Mitigation Measures and Residual Impacts**

Impact analysis is conducted on the basis of the undertaking as described in Section 2.0 and is based on standard mitigative measures incorporated into the design of the undertaking.

In the EPR, mitigation measures are usually identified in a generic way. Details necessary for the implementation of mitigation measures are contained in the Forest Management Planning and Operating Practices (FMPOPs) (Mercer 1998) supplied to all employees and contractors of CBPP. This document outlines both government environmental protection guidelines, permitting required, and CBPP's operating guidelines for forest management planning and operating practices. This document can be viewed in its entirety at <http://www.cbpp.com/fmpop.htm>.

The system used to rate residual impacts is presented below (Table 5.1). This table is modified from those used in larger assessments. The table is a template that is used to summarize the residual impact assessment for each VEC. The impact between an activity, or a component of the undertaking, and a VEC is rated as significant or not significant. An asterisk below the impact-rating symbol indicates that the significant impact will be indirect (e.g. the undertaking affects a food source or habitat rather than directly affecting the VEC).

Table 5.1. Residual Impact Summary Table

	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance							
Geographical Extent							
Duration of Interaction							
Frequency of Occurrence							
Level of Confidence							
Irreversible Impact							
<p><b>IRREVERSIBLE IMPACT DESCRIPTION (IF APPLICABLE)</b>            Negative effects only; describe duration (short or long term) and nature (direct or indirect)</p>							
<p><b>MONITORING</b></p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b>            SM Major            Sm Moderate</p> <p><b>Not Significant</b>            N-M Minor            N-N Negligible            N/A Not Applicable            * = indirect</p> <p><b>Frequency:</b>            1 = &lt;1 event per decade            2 = yearly &lt; decade            3 = monthly &lt; yearly            4 = daily &lt; monthly            5 = continuous</p> </td> <td> <p><b>Extent:</b>            1 = &lt;1 ha            2 = 1 ha &lt; 1 km<sup>2</sup>            3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>            4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>            5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>            1 = low            2 = moderate            3 = high</p> </td> <td> <p><b>Duration:</b>            1 = &lt;1 week            2 = 1week &lt; 1 month            3 = 1 month &lt; 1 year            4 = 1 &lt; 10 years            5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b>            SM Major            Sm Moderate</p> <p><b>Not Significant</b>            N-M Minor            N-N Negligible            N/A Not Applicable            * = indirect</p> <p><b>Frequency:</b>            1 = &lt;1 event per decade            2 = yearly &lt; decade            3 = monthly &lt; yearly            4 = daily &lt; monthly            5 = continuous</p>	<p><b>Extent:</b>            1 = &lt;1 ha            2 = 1 ha &lt; 1 km<sup>2</sup>            3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>            4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>            5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>            1 = low            2 = moderate            3 = high</p>	<p><b>Duration:</b>            1 = &lt;1 week            2 = 1week &lt; 1 month            3 = 1 month &lt; 1 year            4 = 1 &lt; 10 years            5 = ≥ 10 years</p>
<p><b>Significant:</b>            SM Major            Sm Moderate</p> <p><b>Not Significant</b>            N-M Minor            N-N Negligible            N/A Not Applicable            * = indirect</p> <p><b>Frequency:</b>            1 = &lt;1 event per decade            2 = yearly &lt; decade            3 = monthly &lt; yearly            4 = daily &lt; monthly            5 = continuous</p>	<p><b>Extent:</b>            1 = &lt;1 ha            2 = 1 ha &lt; 1 km<sup>2</sup>            3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>            4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>            5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>            1 = low            2 = moderate            3 = high</p>	<p><b>Duration:</b>            1 = &lt;1 week            2 = 1week &lt; 1 month            3 = 1 month &lt; 1 year            4 = 1 &lt; 10 years            5 = ≥ 10 years</p>					

<sup>a</sup> – refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> – refers to fire and/or fuel spill events.

Numerical descriptors appear in each cell of the table in order to describe the nature of the interaction and the level of confidence associated with the impact rating. The ranges of these variables were selected to reflect the scale of the undertaking and the characteristics of the VEC under consideration.

The confidence that the study team has in their impact prediction is rated on a scale of 1-3; a rating of one indicating that existing scientific data on the effects of that type of interaction are insufficient to predict accurately the nature and magnitude of impact, whereas a rating of three indicates that there is a strong basis for the prediction that is made.

Information on the duration and frequency of impacts are also provided in the table. Those that are expected to occur throughout the life of the project are assigned a value of five. Impacts that occur as discrete events are categorized by their expected frequency of occurrence. Other impacts are characterized by the time period or duration over which the particular interaction will occur.

The total area extent of an impact is also indicated in the summary table. When considering the impacts of infrequent or accidental events, such as hydrocarbon spills or forest Fires, the impact characterization is based on a postulated “worst-case” scenario, unless specific information regarding such events is available.

#### **5.1.4 Cumulative Effects**

Past and anticipated forest harvesting operations in Forest Management District 16 are considered in the context of the cumulative effects which the Amendment Areas will have in combination with those other activities.

#### **5.1.5 Impact Definitions**

The definitions outlined in this section have been applied to all impact predictions in Section (5.3) unless otherwise noted. For any such exceptions, applicable definitions are presented within the text of that particular section.

### **PROBABILITY OF OCCURRENCE**

Any potential effects that were deemed impossible or extremely remote were not considered further in this assessment. Unplanned events (forest fire/oil spill) have been considered with respect to their probability of occurrence based on historical records. For all other potential effects, the probability of occurrence is considered to be high.

### **ECOLOGICAL BOUNDARY**

The ecological boundary for each VEC is the forest structure present along the eastern side of the Northern Peninsula that is represented within the Main River Amendment Area and/or that forest structure in the Sheffield Lake area represented within the East Sheffield Lake Amendment Area.



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## IMPACT SIGNIFICANCE CRITERIA

The terminology used to describe potential impacts should be clear, objective, and easily understood. This section provides criteria for evaluating the significance of environmental effects (negative or positive). Precise definitions for the ranking of potential impacts on populations (i.e. wildlife and fish), where applicable, are used in this EPR, as follows:

A **Major (significant)** residual environmental impact is one affecting a whole stock or population of a VEC in an area in such a way as to cause a change in abundance and/or change in distribution beyond which natural recruitment (reproduction and immigration from unaffected areas) would not return that population, or any populations or species dependant upon it, to its former level within several generations.

A **Moderate (significant)** residual environmental impact is one affecting a portion of a population in an area that results in a change in abundance and/or distribution over one or more generations of that portion of the population, or any populations or species dependant upon it, but does not change the integrity of any population as a whole; it may be localized. A change in habitat (including food sources) that produces the same result in populations would be moderate.

A **Minor (not significant)** residual environmental impact is one affecting the population or a specific group of individuals in a localized area and/or over a short period (one generation or less), but not affecting other trophic levels or the integrity of the population itself. As above, equivalent ratings are assigned to indirect (habitat) effects.

A **Negligible (not significant)** residual environmental impact is one affecting the population or a specific group of individuals in a localized area and/or over a short period in such a way as to be similar in effect to small random changes in the population due to natural irregularities, but having no measurable environmental effect on the population as a whole.

## POTENTIAL INTERACTIONS

Unless otherwise stated, the potential interaction between the undertaking and the VEC is the alteration of habitat within the applicable Amendment Area(s).

### Construction Activities

Construction activities would be negligible during the Spring of 2000 as the roads needed to access the required wood are already in place in Main River. In order to access the wood required for Spring 2001, five kilometres of road each would be constructed during the Summer/Fall of 2000 in Main River and East Sheffield Lake. During 2001, another 3km of road will be constructed in East Sheffield Lake. These would require a right-of-way to be cleared, organic matter to be removed (grubbing), sub-grade built, and the road surface constructed.

The potential impacts will be the loss of forest habitat, and noise from machinery. The total length of road within the Main River Amendment Area is 5km (proposed). The loss of habitat would be approximately 4ha.

The total length of road within the East Sheffield Lake Amendment Area is 8km. The loss of habitat would be approximately 6.4ha. The estimated total time of construction will be approximately 7-10 weeks in each location.

### Operation Activities

Operation activities would see the harvesting of 120,000m<sup>3</sup> of over-mature softwood over a two-year period (60,000m<sup>3</sup> per year) from Main River. This would be taken from the approximately 1,429ha of Balsam Fir and Black Spruce present within the Main River Amendment Area that is considered mature enough to harvest (greater than 80 years old). Table 4.5 shows the total amount of each habitat type and softwood that could be harvested within the Main River Amendment Area.

In the Sheffield Lake Amendment Area, 35,000m<sup>3</sup> of over-mature softwood would be harvested in 2001. This would be taken from the approximately 798ha of Black Spruce and Balsam Fir present within the East Sheffield Lake Amendment Area that is considered mature enough to harvest. Table 4.7 shows the total amount of each habitat type and softwood that could be harvested within the Amendment Area.

### Rehabilitation Activities

Once harvesting is completed, re-growth of the trees occurs either in the presence or absence of silviculture operations. Re-growth to commercially harvestable stands can take up to sixty years.

## IMPACT ANALYSIS

Unless otherwise stated in each applicable impact assessment, the activities that would potentially affect the identified VEC would be (road) construction, (timber harvesting) operation, or (vegetation re-growth) rehabilitation activities.

## 5.2 VEC IDENTIFICATION

The issues/concerns identified in the Guidelines are listed as:

- the Main River portion of the **Newfoundland Marten Population**;
- status of the Main River to the **Canadian Heritage River System**;
- the **Forest Structure** of the area;
- increased natural **Resource Utilization** resulting from access provided by resource roads;
- Cumulative effects of **Forest Harvesting** in District 16; and
- **Watercourse Navigation** of affected stream crossings.

Other potential issues/concerns include:

- effects on **Fish, Fish Habitat and Fisheries**; and
- effects on **wildlife** (avifauna, big game, furbearers).

Thus, for this analysis, there are eight VECs, three of which (Pine Marten, CHRS Status, and Forest Structure) apply only to the proposed Main River Amendment Area.

### 5.3 INTERACTION MATRICES

Interaction matrices for the three identified phases of the undertaking (construction, operation, and revegetation) are presented below in Tables 5.2-5.4.

Table 5.2. Interaction matrix for the construction phase.

Preparation activity	Newfoundland Marten*	Forest Structure *	CHRS Status*	Forest Harvesting (cumulative)	Watercourse Navigation	Resource Utilization
Cutting of Right-of-way	X	X	X	X		X
Road Construction	X	X	X	X	X	X
Noise	X					X
Dust/sediment						X
Equipment refuelling						

\* - applies only to Main River Amendment Area.

Table 5.3. Interaction matrix for the operation phase.

Operation activity	Newfoundland Marten*	Forest Structure	CHRS Status*	Forest Harvesting (cumulative)	Watercourse Navigation	Resource Utilization
Cutting of Merchantable Wood	X	X	X	X		X
Trucking of Wood	X					X
New Road Construction	X	X	X	X	X	X
Noise						X
Dust/sediment						
Equipment refuelling						

Table 5.4. Interaction matrix for the revegetation phase.

Revegetation activity	Newfoundland Marten*	Forest Structure	CHRS Status*	Forest Harvesting (cumulative)	Watercourse Navigation	Resource Utilization
Revegetation Surveys						
Planting of Seedlings		X		X		
Thinning	X	X		X		X
Noise	X					X

## 5.4 IDENTIFICATION AND EVALUATION OF IMPACTS

### 5.4.1 Newfoundland Marten

The Guidelines require a description of: *“the potential effects of the undertaking as related to:*

- *the Main River portion of the Newfoundland marten.”*

*In addition, the Guidelines ask for “A description of rehabilitation plans intended for the undertaking which are being considered must be described. The proponent should identify the need for monitoring programs and commit to any ongoing monitoring programs. As a minimum, the proponent should address the current pine marten study in terms of its participation and support in the study and provide details on how the current study or any future activities being considered will affect the study”*

The potential impact of the proposed undertaking to the Newfoundland Pine Marten and the current Pine Marten Study only refers to the Main River Amendment Area.

#### 5.4.1.1 Existing Conditions

See Section 4.2 for a description of the existing condition of the Newfoundland Pine Marten.

#### Ecological Boundaries

Newfoundland Pine Marten occur within the boundary of FMD 16. In particular, there is considered to be a viable population within the Main River area. In order to protect the population of Pine Marten in the area, a no-trapping zone was identified and closed to all dry-land trapping (I. Pitcher, pers. comm.). This area is also the boundary of the current Pine Marten Study (Figure 4.2). The proposed Main River Amendment Area Falls within this no-trapping boundary.

The boundary of potential impact is within the extent of the proposed Main River Amendment Area. The duration of disturbance within the Amendment Area is considered extended; i.e. until the habitat can be suitable for Pine Marten (as defined by JWEL (1998)).

#### 5.4.1.2 Impact Significance Criteria

Section 5.1.5 describes the criteria used to assess the residual impacts of the undertaking upon this VEC.

### 5.4.1.3 Potential Interactions

In addition to the potential interaction identified in Section 5.1.5, other potential interactions would be: the interruption or invalidation of the current Pine Marten Study being conducted in the area on the responses of Pine Marten to a modified harvest strategy; and the disturbance of Pine Marten due to the noise associated with construction activities.

### 5.4.1.4 Identified Issues and Concerns

The issues identified by the Guidelines and public comments relate to the potential impact that the harvesting of the Amendment Area would have on the current Pine Marten study. The total area north of Main River was thought to be the control area where no harvesting would occur. Less concern was expressed regarding the potential direct effect of harvesting on the Marten population.

### 5.4.1.5 Existing Knowledge

#### Life History

Studies on Newfoundland Pine Marten have begun to piece together the life history of these animals in Insular Newfoundland.

Bissonette *et al.* (1988) found that female Marten in Newfoundland probably breed successfully during their third Summer. Kits are usually born in March-April (O'Driscoll 1994) and litters usually contain 2-3 kits (Bissonnette *et al.* 1988). Each Marten maintains a territory that it defends from other Marten. The size can vary, however, the average home range size of an adult male Marten in Little Grand Lake was 16km<sup>2</sup> (JWEL 1998). Females usually have a home range approximately two-thirds that of a male (11km<sup>2</sup>). Territories of same-sex Marten do not generally overlap.

If no room exists within a kit's natal home range to establish a territory, it will become transient and disperse to a new area in an attempt to establish one. Transient Marten that were dispersing from the Little Grand Lake study area were generally less than two years old (dispersing was defined as a permanent move from the animals natal home range) (Bissonnette *et al.* 1988). It appeared that kits were most likely to be transients and yearlings were more likely to remain and colonize an area. One of 16 kits studied managed to establish a permanent home range within the study area (a female) while at least five of ten yearlings established permanent home ranges (Bissonnette *et al.* 1988). Most dispersion occurred from September through December. Long distance dispersal was documented for five animals in the study. The linear distances traveled were between 24 and 40 km, however one had to traverse around Grand Lake to get to its new range and therefore probably traveled much farther than the linear distance suggests.

Throughout most of the study, adults and yearlings were found to be in a 1:1 ratio and sex ratios were not significantly different from 1:1 for all age classes.

## Effects of Forest Harvesting

As part of the Little Grand Lake Environmental Impact Statement submitted in 1990, Corner Brook Pulp and Paper cooperated in an extensive study on the effects of forest harvesting on Marten and small mammals in Western Newfoundland (Bissonette *et al.* 1988). This work was conducted in the Grand Lake-Little Grand Lake area by the Utah Cooperative Fish and Wildlife Research Unit, the Department of Fisheries and Wildlife, Utah State University, and the Newfoundland and Labrador Wildlife Division. Marten were tracked using radio-telemetry before, during, and after logging activities in order to determine its effects. In addition, small mammal trapping in uncut and harvested areas was conducted to determine the effect of harvesting on the food-base of marten. Animals trapped were principally meadow vole (*Microtus pennsylvanicus*) and masked shrew (*Sorex cinereus*).

The study determined that Marten use of clear-cuts was limited; kits were located in clear-cuts 11.5% of the time and older Marten 2.2% of the time. Another study has also indicated that Marten of all ages avoided clear-cuts during logging operations and for the first nine months afterward (Fredrickson and Bissonette 1990). Only three of the ten Marten provided sufficient radio signals to compare pre- and post-logging home range size (Bissonette *et al.* 1988). One experimental animal (located within the cut area before it was harvested) relocated from one part of the experimental zone to another before logging activities began; the new home range was 25% smaller than the old. Two control animals (located in the uncut control area before harvesting) showed an increase of 100 and a decrease of 13 percent respectively in home range size. The increased home range was primarily harvested forest within the experimental area.

Marten deaths during the study were attributable to at least four factors; disease, predation, handling, and accidental trapping. The number of Marten succumbing to each factor was 10, 3, 2, and 1 respectively.

Trapping of food-prey indicated that shrew numbers tended to remain unchanged between the old-growth (control) and harvested (experimental) areas until cut-overs became approximately 13 years of age. At that time, shrews became 3-7 times more abundant in the cut-over areas. In addition, meadow voles showed a similar pattern, whereby the old-growth and harvested areas had similar populations. It was noted that during the study, a significant drop in the overall food-prey density occurred over all habitat types sampled. Meadow vole populations apparently crashed in the Spring of 1987 and shrew populations did not show the typical population trend of an increase during the Summer and decrease in Winter. It appeared that something happened during the Summer of 1986 to prevent shrews from increasing.

The National Recovery Plan for the Newfoundland Pine Marten (Forsey *et al.* 1995) has identified the need for background studies to fill information gaps and gather necessary data pertinent to recovery efforts. Among the goals is the need to determine population status and distribution of Pine Marten and to conduct research into the suitability of older second-growth forests for Pine Marten.

One of the objectives of the Western Newfoundland Model Forest (WNMF) was to develop a Decision Support System (DSS) which would assist resource managers in developing forest harvesting plans that also consider other resources such as wildlife (JWEL 1998). The WNMF developed habitat suitability indexes (HSI) for a number of



species including Marten. HSI rank habitat preference between 0.0-1.0; a 0.0 being unsuitable and 1.0 being most suitable.

Using the large amount of Marten data that has been collected in the Little Grand Lake area, HSI were developed for various stand types and age-classes used in the forest inventory database. The indexes were developed for stands in terms of food value and cover value for Marten. Table 5.5 shows the HSI values given. DFRA has determined that habitat types having less than a 0.5 HSI are not considered suitable habitat (JWEL 1998). Therefore, all forest types greater than 40 years old can be considered suitable Marten habitat for either food and/or cover.

Table 5.5. Pine Marten HSI ratings for forest stand and age classification for food and cover value (reproduced from JWEL 1998). Cover ratings are in parentheses.

Stand Age	Working Group (Forest Type)		
	Balsam Fir/ Black Spruce	Softwood Dominated Stands	Hardwood Dominated Stands
81+	1.0 (1.0)	1.0 (0.8)	1.0 (0.8)
60-80	0.8 (1.0)	0.8 (0.8)	0.8 (0.8)
40-60	0.5 (0.8)	0.6 (0.4)	0.6 (0.4)
20-40	0.3 (0.2)	0.4 (0.1)	0.4 (0.1)
0-20	0.2 (0.0)	0.2 (0.0)	0.2 (0.0)

#### 5.4.1.6 Current Main River Research

Within FMD 16, a Pine Marten study is currently underway with the cooperation of the DFRA and CBPP on the responses of Marten to a modified harvest strategy. The area for this study is the Government of Newfoundland and Labrador Gazetted boundaries of the area closed to all snaring and trapping within the Main River watershed. This area is 589 km<sup>2</sup> in size (Figure 4.2). A Memorandum of Understanding (MOU) was drafted for this study on March 1, 2000. This draft MOU lays out the working understanding of the study and the responsibilities of both CBPP and DFRA. Within the study area, “harvesting”, “modified harvesting” and “no harvesting” areas have been identified. The proposed Amendment Area has been incorporated into this study as one of the designated harvesting areas. The MOU states that all activities within the study area be disclosed to each party before being carried out so that misunderstandings and loss of study protocol are avoided.

#### 5.4.1.7 Impact Analysis

See Section 5.1.5.

#### 5.4.1.8 Mitigation/Marten Protection

Unmerchantable softwood, hardwood stands, and all scrub within the Amendment Area will not be harvested. In addition, leave-zones (buffers) of forest will be left around all

watercourses >1m wide. These buffers are 20m in width; a minimum 50m buffer will be left next to Big Brook.

Since mid-December 1998, the DFRA and CBPP have met on a regular basis to explore the incorporation of habitat requirements for the maintenance and recovery of the Pine Marten within the context of CBPP's annual operating plans. To facilitate the process, CBPP and District Managers have identified areas that would not be harvested in the near future, if at all. These areas were evaluated in terms of the amount of forest that exists within various age-classes, the quantity of preferred Marten habitat, as well as the spatial relationships between these. Short-term Marten population and habitat goals for FMD 14, 15, and 16 have been identified and are used to help determine if habitat objectives are being met.

The short-term population goal for Districts 14, 15, and 16 is a minimum of 260 adult or territorial Marten. The long-term population goal is a minimum of 400 Marten. CBPP and DFRA have recently reached an agreement on habitat protection that will maintain the short-term Marten population goal, consisting of three separate populations each with a minimum viable population of 50 animals. The locations of the three populations are:

- the area north of the Humber River up to the northern boundary of FMD 16 including Gros Morne Park (70-80 Marten);
- the Little Grand Lake Reserve area (130+ Marten); and
- the western portion of FMD 15 and FMD 14 (50 Marten).

In addition to the ongoing commitment by CBPP and DFRA to protect the Pine Marten, the proposed Amendment Area has been incorporated into the current study on the responses of Marten to a modified harvest strategy.

#### **5.4.1.9 Residual Impact Analysis**

Table 5.6 summarizes the residual impact prediction of the proposed undertaking on the Pine Marten population in the Main River area and on the current Pine Marten Study ongoing in the area. With the agreements between CBPP and DFRA regarding the protected habitat for Pine Marten populations, and given the integration of the amendment harvesting into the current Pine Marten study, **a minor (not significant) residual environmental effect is predicted.**

#### **5.4.1.10 Accidental Events**

A large-scale forest fire would have the potential to create a significant impact on the Pine Marten habitat in the Main River area. As shown earlier, the DFRA Fire summary data for FMD 16 over the last ten years indicates that forest Fires are very infrequent (approximately 0.17/month) and of a small average size (approximately 7ha in size) and are therefore considered to be of very low frequency, duration and extent. The Residual Impact Summary considers an "average" fire based on the information provided by DFRA. With the current mitigation techniques utilized by CBPP during harvesting activities, forest fires are considered to be highly unlikely.

**5.4.1.11 Monitoring**

As part of the current Pine Marten study, the Marten population within the study area will be monitored until March of 2005.

Table 5.6. Residual Impact Summary of the proposed undertaking upon the Pine Marten population and current study.

<b>Pine Marten</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
<b>Residual Impacts</b>							
Significance	N-M*	N-M*	N-M*	N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	3	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impact	Yes	No	No	No			
<p><b>Irreversible Impact</b></p> <p>If roads are left and/or maintained as public access and not revegetated, the 4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b></p> <p>The current Pine Marten Study will continue monitoring the Pine Marten population within the Main River Study Area until March 2005.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
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<sup>a</sup> – refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> – refers to a fire event.

#### 5.4.2 Main River and the Canadian Heritage River System

The Guidelines require a description of: ***“the potential effects of the undertaking as related to:***

- ***The status of the Main River to the Canadian Heritage River System which was based primarily on natural and recreational values. The proponent should be aware that government approved a protected area corridor for the Main River and required that operating plans submitted for forest harvesting in the Upper Humber/MainRiver area give due consideration to the unique wilderness qualities of the entire area.”***

The proposed Main River Amendment Area is part of a larger area for which harvesting had previously been approved, and which followed from an extensive environmental impact assessment process (Upper Humber/Main River Wood Harvesting Operation Environmental Impact Statement). As a consequence of that process, boundaries were established for a protected corridor along the Main River.

Given that the existing boundaries were deemed adequate to protect the river, and its candidacy as a Canadian Heritage River at the time of Nomination in 1991, there is no reason to believe that the harvesting program as described in this Environmental Preview Report would have any negative effect on this candidacy as the Province proceeds with the CHRS approval process.

The main concern for recreation would be the effect of harvesting operation on the view from the river as individuals (in kayak or canoe) traverse the river. The impact analysis considers this effect, based on viewshed analysis. Random points, approximately one kilometre apart along the river, were chosen and a 3D analysis of the viewshed was conducted to determine the specific portions of the Amendment Area which could be seen from the river. That portion of the proposed Main River Amendment Area that can be seen from the river is shown in Figure 5.1. This analysis has determined that a total area of 290ha would be visible, of which approximately 65% (188ha) is predominately softwood and would be harvested. Only portions of the 188ha area would be visible at any one location and the great majority of it would be a secondary (beyond the primary horizon) view. Residual Impacts predictions are presented in Table 5.7.

The accidental event would be a forest fire. The definition of such an effect is as discussed previously for Pine Marten.

Figure 5.1. Viewshed of visible Main River Amendment Area from Main River.

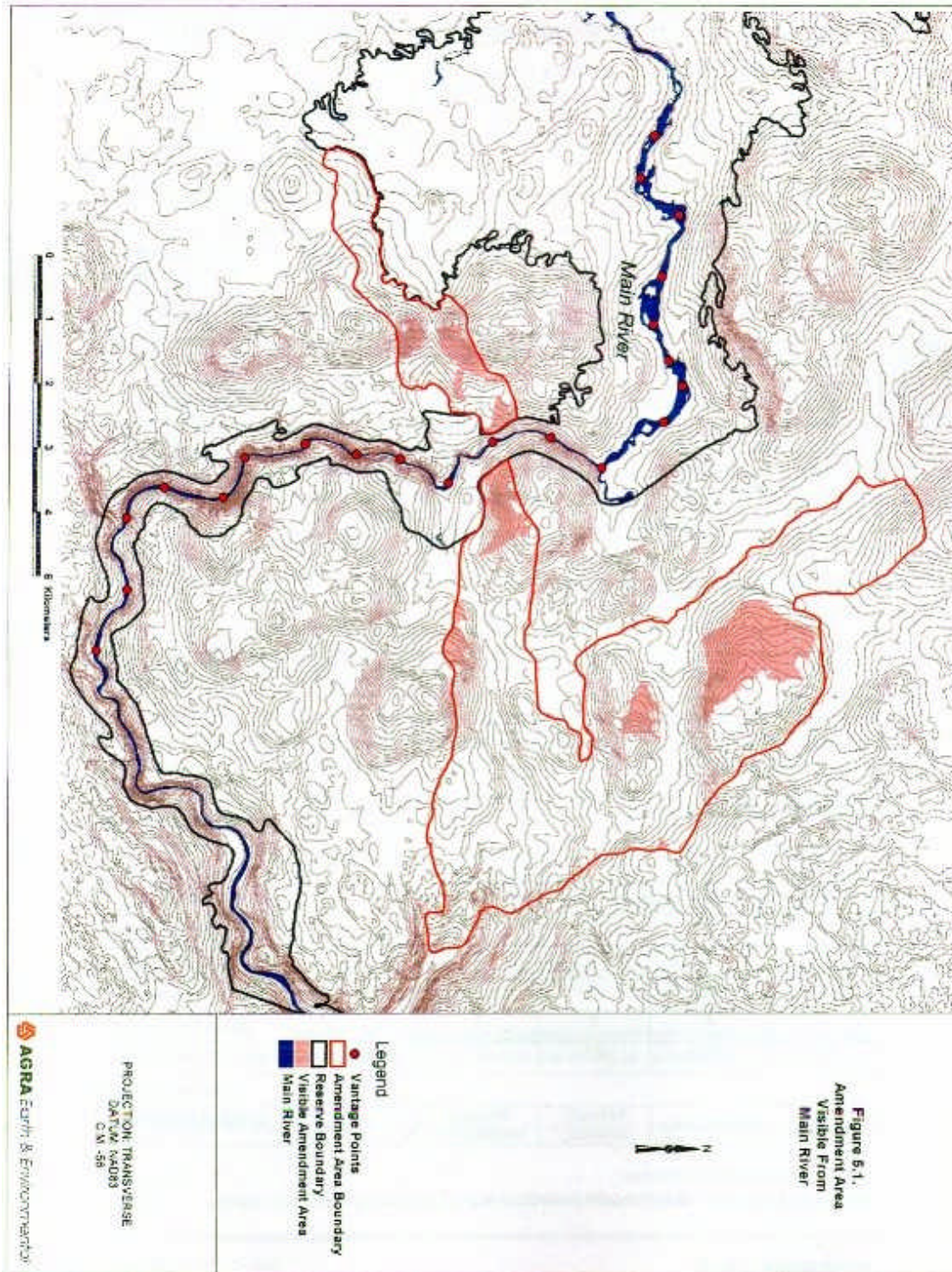


Table 5.7. Residual Impact Summary of the proposed undertaking upon the Main River viewshed.

<b>Viewshed Impact</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-N*	N-N	N-N	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impact	Yes	No	No	No			
<p><b>Irreversible Impact</b> The roads will be a permanent alteration of habitat, but of limited, if any, visibility from the river (long term; indirect).</p>							
<p><b>Monitoring</b> None Proposed.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
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<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

### 5.4.3 The Forest Structure

The Guidelines require a description of: *“the potential effects of the undertaking as related to:*

- *the forest structure of the area within the undertaking with special emphasis on the undisturbed, old growth forest of the Main River region.”*

The potential effects of the undertaking on the Gap Replacement forest structure only apply to the Main River Amendment Area. The East Sheffield Lake Amendment Area is not within the potential forest structure location, and hence does not have an interaction.

#### 5.4.3.1 Existing Conditions

See Section 4.7 for a description of the existing forest structure.

#### Ecological Boundaries

See Section 5.1.5 for a description of the forest structure boundary. The Main River Amendment Area falls within a regional distribution of Gap Replacement forest structure which covers the eastern side of the Northern Peninsula.

The boundary of potential impact is within the extent of the proposed Main River Amendment Area. The duration of disturbance within the Amendment Area is considered extended; i.e., until forest regeneration is completed within the amendment boundary.

#### 5.4.3.2 Impact Significance Criteria

The following criteria have been applied to this issue.

**A major (significant) residual environmental effect** is one affecting all of a land type (or plant community) in the area in such a way as to cause a change in abundance and/or change in distribution of species comprising this community. This change would be such that natural recruitment (reproduction and immigration from unaffected areas) would not return the system, to its former level of diversity within several generations.

**A moderate (significant) residual environmental effect** is one affecting a portion of a land type in the area that results in a change in abundance and/or distribution over one or more generations of that portion of the land type dependent upon it, but does not change the integrity of the area as a whole; it may be localized.

**A minor (not significant) residual environmental effect** is one affecting a specific example of a land type community in the area at a localized level and/or over a short period (one generation or less), but not affecting other trophic levels or the integrity of the vegetation community itself.

**A negligible (not significant) residual environmental effect** is one affecting the land type in the area at a localized level and/or over a short period in such a way as to be similar in effect to small random changes due to natural irregularities, but having no measurable effect on the land type as a whole.



### 5.4.3.3 Potential Interactions

Potential interaction between the proposed undertaking and the forest structure is the harvesting of softwood (Black Spruce and Balsam Fir) during road construction and harvesting operations within the Amendment Area. Other potential interactions would be soil or substrate disturbance that would affect the future regeneration potential of the area.

### 5.4.3.4 Identified Issues and Concerns

The issue raised throughout this assessment is the contention that harvesting in the proposed Main River Amendment Area will “cut the last remaining stands of Gap Replacement forest in Newfoundland”. The concern is that this harvesting would result in the permanent loss of this forest structure and its associated ecosystem components such as avifauna, raptors, furbearers, and ectomycorrhizal (EM) fungi associated with conifer roots.

### 5.4.3.5 Existing Knowledge

Plant communities play a critical role in the functioning of terrestrial and aquatic ecosystems. Plant communities in the terrestrial environment provide food and shelter for wildlife and assist in controlling erosion and drainage. Some plant communities are also valuable because they occur infrequently and therefore a significant loss may threaten the viability of the population. In that regard, the Gap Replacement forest structure present along the eastern side of the Great Northern Peninsula differs from the typical large-scale disturbance forest structure found more generally throughout Insular Newfoundland (see Section 4.7).

The dominant forest-type in the Upper Humber/Main River area is identified as *Pleurozium*-balsam Fir (Northland Associates 1986). This is a stable forest-type that re-develops into the same type after logging (Northland Associates 1986; Meades and Moore 1994), however, Fire would likely change this type into a Black Spruce-Feathermoss dominated forest-type. Regeneration under the *Pleurozium*-balsam Fir stand type is considered adequate throughout the Upper Humber/Main River area (Meades and Moores 1994). To date, natural re-growth in the southern portion of the Main River area which has been harvested is adequate and seeding has not been necessary (G. VanDusen pers. comm.).

### 5.4.3.6 Impact Analysis

See Section 5.1.5.

An accurate estimate of the total Gap Replacement forest on the Northern Peninsula is not available because the lands and timber along the eastern side of the Peninsula are not mapped completely, nor has the extent of this forest structure been delineated. However, based on the available information which indicates that this forest structure is located along most of the eastern side of the Great Northern Peninsula, an estimate of the amount of Gap Replacement forest in CBPP's Management District 16 was completed (Table 5.8). Of the identified boundary of 4,800 km<sup>2</sup>, an estimate of 60,000 ha of Gap Replacement forest exists. The area of FMD 16 which contains Gap

Replacement forest structure includes all forest north of the Main River Reserve. There are approximately 20,000 hectares of Gap Replacement forest in this area of FMD 16. The total amount of softwood forest inside the Main River Amendment Area represents approximately 7.4% of the forest in the above identified FMD 16 boundary. This can be compared with the much larger total amount of Gap Replacement forest which has been set aside as a result of the Main River Reserve and leave areas agreed to by DFRA and CBPP to protect the Pine Marten. In addition, all the forest structure remaining in the area will not necessarily be harvested. This Management District represents approximately 30-35% of the eastern side of the Peninsula up to the Cloud River watershed (R. Brake pers. comm.).

Table 5.8. Forest within CBPP limits on the eastern side of the Northern Peninsula that may contain the Gap Replacement forest structure (hectares).

Age-Class	Amendment Area	Main River Reserve	Leave areas for DFRA	Forest Remaining in FMD 16	Total
0-20	12.2	0.0	0.0	26.9	39.1
21-40	0.0	0.0	0.0	14.1	14.1
41-60	0.0	3.9	0.0	12.7	16.6
61-80	0.0	0.2	0.0	104.8	105.0
81-100	16.6	62.9	52.7	114.3	246.5
101-120	388.6	413.1	1.6	874.1	1,677.4
121+	1,023.9	2,885.0	2,057.7	11,490.1	17,456.7
Total	1,441.3	3,364.1	2,112.0	12,637.0	19,555.4

Thus, the proposed Main River Amendment Area harvesting of Gap Replacement forest can be placed in context as follows:

- Potential total Gap Replacement forest  $\geq$  60,000ha
- Potential Gap Replacement forest in FMD 16 ~20,000ha
- Protected Gap Replacement forest in Main River and adjacent areas ~3,500ha
- Proposed Main River Amendment Area harvest ~1,500ha.

#### 5.4.3.7 Mitigation

Standard and approved mitigation techniques will be employed in order to reduce impacts. These mitigation techniques are outlined in the FMPOP (Mercer 1988). These mitigation techniques also address all applicable regulatory and permit requirements.

Unmerchantable softwood, hardwood stands, and all scrub within the Amendment Area will not be harvested. In addition, leave-zones (buffers) of forest will be left around all watercourses >1m wide. These buffers are 20m in width. A minimum 50m buffer will also be left next to Big Brook.

#### 5.4.3.8 Residual Impact Analysis

Table 5.9 summarizes the residual impact predictions of the proposed undertaking on the Gap Replacement forest structure on the Northern Peninsula. A **minor (not significant) residual environmental effect** is predicted upon the Gap Replacement forest structure.

#### 5.4.3.9 Accidental Events

A large-scale forest fire would have the potential to create a significant impact on the forest structure in the Main River area. The DFRA Fire summary data for FMD 16 over the last ten years indicates that forest Fires are very infrequent (approximately 0.17/month) and of a small size (approximately 7ha in size) and are therefore considered to be of very low frequency, duration and extent (Table 5.10). The Residual Impact Summary addresses an average Fire based on the information provided by DFRA. With the current mitigation techniques utilized by CBPP during harvesting activities, forest Fires are unlikely.

#### 5.4.3.10 Monitoring

Revegetation surveys are conducted as a routine part of site follow-up monitoring and silviculture analysis. Surveys will identify areas as having sufficient natural revegetation or requiring supplemented seeding. If supplemental seeding is required, natural species will be used. To date, the revegetation surveys conducted on the harvesting in FMD 16 in the southern portion of the Main River area indicates sufficient natural revegetation (G. VanDusen pers. comm.).

Table 5.9. Residual Impact Summary of the proposed undertaking upon the forest structure of the area.

<b>Forest Structure</b>	<b>Construction Activities</b>	<b>Operation Activities</b>	<b>Revegetation<sup>a</sup></b>	<b>Accidental Events<sup>b</sup></b>			
Residual Impacts							
Significance	N-M	N-M	N-M	N-N			
Geographical Extent	2	4	4	1			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	1			
Level of Confidence	2	2	2	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 4ha of road surface will be a permanent loss of forested habitat (long term; direct).</p>							
<p><b>Monitoring</b> Revegetation surveys are conducted as a routine part of site follow-up monitoring and silviculture analysis. Surveys will identify areas as having sufficient natural revegetation or requiring supplemented seeding. If supplemental seeding is required, natural species will be used.</p>							
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<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

Table 5.10. DFRA Fire data summary for FMD 16 for the last ten seasons (in hectares).

Year	Final Size	No. of Fires	Mature Timber	Regen / Immature Timber	Cut-over	Non-productive
1990	0	1	0	0	0	0
1991	53	1	0	0	0	53
1992	6	3	0	0	3	3
1993	0	1	0	0	0	0
1994	2	4	0	0	1	0
1995	0	0	0	0	0	0
1996	0	6	0	0	0	0
1997	4	3	0	3	1	0
1998	0	1	0	0	0	0
1999	1	3	0	0	0	1
Average	6.6	2	0	0.3	0.5	5.8
Total	66	23	0	3	5	58

#### 5.4.4 Historical And Current Navigation Of Proposed Watercourse Crossings

The guidelines require a description of: ***“the potential effects of the undertaking as:***

- ***watercourse navigation as required pursuant to the NWPA.”***

For the purposes of navigation, all proposed stream crossings identified are those which are visible on the latest 1:50,000 scale topographic map as per the Forestry Guidelines for the Protection of Fish Habitat in Newfoundland and Labrador (Scruton *et al.* 1997). It is assumed that any streams which are not portrayed on the topographic map are not navigable. All streams identified to be crossed lack a defined waterbody (pond, etc.), and are shown on the 1:50,000 topographic map as simply short streams draining off sloped hills. DFO identified tributary streams within the Big Brook watershed which contained waterbodies as being dried up during their aerial fish habitat surveys (Porter *et al.* 1974). From the mean water depths measured on the main stem of Big Brook (15-23 cm) and Tributary T2 (14 cm) at the fish density sampling stations, it is apparent that water depths at all stream crossings would be extremely low and not likely to be considered navigable. However, Canadian Coast Guard will be consulted once site specific information on crossing locations is available.

Five-year plans and even Annual Work Schedules (AWS) submitted to DFRA are too broad to pinpoint the exact location of stream crossings and the associated infrastructure. Roads are usually constructed in the Summer or Fall before the operating season in which they are needed. When a crossing site is determined, a detailed engineering survey is conducted of the area in order to pinpoint the most applicable location. This survey is also required to determine the ground profile and the expected extreme flows in a given return period (typically 25 years). The survey information is then available for submission of applications for needed permits and approvals to the Provincial Department of Environment, the Federal Department of Fisheries and Oceans, and other relevant agencies, eg. Canadian Coast Guard (NWPA). Work can proceed only once approvals are granted from all regulatory bodies. When approval is given, actual construction work is conducted in accordance with CBPP's Environmental Protection Plan.

### **5.4.5 Fish, Fish Habitat and Fisheries**

The Guidelines require a description of Fish, Fish Habitat and Fisheries, but did not explicitly require that the potential effects of this undertaking be considered.

#### **5.4.5.1 Existing Conditions**

See Section 4.5 for a description of the existing fish and fish habitat conditions present within and around the Amendment Areas.

Fish and fish habitat are present within both Amendment Areas.

#### **Ecological Boundaries**

See Section 5.1.5. The potential boundary of interaction is the watercourses within the Main River and East Sheffield Lake Amendment Areas. In addition to the watercourses within the Amendment Areas, all areas downstream which are fed by these tributaries have the potential to be affected. In particular, this would include the lower section of Big Brook and the lower section of the main stem of Main River.

#### **5.4.5.2 Impact Significance Criteria**

See Section 5.1.5.

#### **5.4.5.3 Potential Interactions**

Potential interaction between the undertaking and fish and fish habitat is the disturbance of fish and/or habitat as a result of instream works, siltation caused by construction/harvesting near watercourses, and potential hydrocarbon spills into the aquatic environment.

#### **5.4.5.4 Identified Issues and Concerns**

Specific concerns were outlined with respect to the potential loss of habitat in the area of potential stream crossings. In addition, there are concerns that excess siltation in small upstream tributaries have the potential to damage Atlantic Salmon habitat in Big Brook and Main River. There are also concerns regarding inadequate buffer size on certain watercourses, Big Brook in particular.

#### **5.4.5.5 Existing Knowledge**

Sedimentation (increased sediment load deposition) is perhaps the most recognized environmental effect on aquatic ecosystems and can affect all trophic levels (VBNC 1997). Sedimentation alters habitat by changing the physical characteristics, distribution and relative abundance of existing substrate types. Changes to limiting habitats may result in changes in the carrying capacity of the population. Sedimentation may fill rearing pools, cover coarse substrates and alter channel flow, thereby reducing the suitability of habitat for existing communities of fish and aquatic invertebrates.

Sedimentation has also been determined to be one of the main impacts of forest harvesting activities with inappropriate mitigation techniques (McCarthy 1996).

The deposition of sediment may clog spaces between gravel which prevents the flow of oxygenated water and removal of waste products from developing eggs (Rogerson 1986). This often causes suffocation and egg mortalities, and may prevent future use of spawning areas (Beschta and Jackson 1979; Chapman 1988). The elimination of sheltered areas between boulders and gravel particles will also affect juvenile fish (Scrivener and Brownlee 1989).

#### **5.4.5.6 Impact Analysis**

See Section 5.1.5.

In total, six stream crossings will be required in the proposed Main River Amendment Area (Figure 2.3) and four crossings will be required in the proposed East Sheffield Lake Amendment Area (Figure 2.4).

Five-year plans and even Annual Work Schedules (AWS) submitted to DFRA are too broad to pinpoint the exact location of stream crossings and the associated infrastructure. Roads are usually constructed in the Summer or Fall before the operating season in which they are needed. When a crossing site is determined, a detailed engineering survey is conducted of the area in order to pinpoint the most applicable location. This survey is also required to determine the ground profile and the expected extreme flows in a given return period (typically 25 years). The survey information is then submitted with an application to conduct instream works to the Provincial Department of Environment and the Federal Department of Fisheries and Oceans. Work can proceed only once approvals are granted from regulatory bodies. When approval is given, actual construction work is conducted in accordance with CBPP's Environmental Protection Plan.

#### **5.4.5.7 Mitigation**

CBPP is committed to protecting fish habitat, particularly sensitive areas such as spawning and rearing areas, throughout its harvesting areas by taking the following measures:

- Properly planned and constructed roads and stream crossings;
- Properly planned and located harvest blocks, landings and proper logging practices; and
- Establishment of treed buffers adjacent to watercourses all as described in the FMPOP (Mercer 1998).

Riparian zones, which occur adjacent to watercourses, contribute significantly to the biodiversity of the boreal forest and hold a variety of important values. The protection and management of riparian zones is an important component of forest management and planning. Four key resource values associated with riparian zones that require special consideration when developing and implementing forest management plans are:

- Water quality



- Fish Habitat
- Wildlife Habitat
- Aesthetics

A primary management tool employed by CBPP to protect these values is the maintenance of treed buffers adjacent to watercourses. A buffer includes woody vegetation including willow and alder from the high water mark of the watercourse.

Treed buffers serve a variety of functions including:

- Filter strips to capture sediment and organic matter from entering a watercourse from adjacent disturbed land;
- Maintenance of water temperature, in rivers and streams;
- Maintenance of wildlife habitat and wildlife habitat corridors; and
- Maintenance of aesthetic quality.

When developing forest management plans, a balance must be struck to maintain important identified features, while permitting the extraction of the timber resource (Mercer 1998). Since the value of specific riparian zones varies between sites, a single guideline for buffer retention to address all values and situations is not possible or desirable, however, a minimum 20m buffer must be retained on all waterbodies (Scruton *et al.* 1997). Site specific factors such as season of harvest, slope, soils, timber health (insect and disease damage), and stand age must also be considered. As part of CBPP's planning process, a watercourse classification system has been established in the FMPOP. All watercourses within CBPP timber limits are evaluated and classified using this system and protection buffers are prescribed.

Using this classification system, rather than the prescribed minimum 20m (plus slope factor) of Scruton *et al.* (1997), the buffer along Big Brook will be a minimum 50m wide. In areas where harvesting may be difficult or not feasible, the entire area below the permanent road that borders Big Brook will not be harvested. This was determined as a result of the spawning and rearing potential of Big Brook and the lower section of Main River. It also provides added protection to the main stem of Main River.

Culvert installation and stream crossing maintenance can result in erosion and sedimentation phenomena. As well, poor culvert design and installation practices can produce habitat disruption and migration barriers. Guidelines are available for proper design, installation and maintenance of stream crossing facilities, and these have been incorporated into CBPP practices.

#### 5.4.5.8 Residual Impact Analysis

Table 5.11 summarizes the residual impact predictions of the proposed undertaking on the fish and fish habitat that may be in the area of the amendments. **A minor (not significant) residual environmental effect is predicted.**

#### 5.4.5.9 Accidental Events

An accidental hydrocarbon spill would have the potential of a serious negative impact upon the fish and fish habitat within and downstream of the Amendment Areas, if a spill was of sufficient size. Data regarding spills in FMD 16 indicate that no large spill as a

result of CBPP operations has been recorded. The frequency of any spill event would therefore be very low. With mitigation measures to prevent the loss of hydrocarbons into the environment (self-containing fuelling systems, dedicated fuelling locations, spill containment equipment, etc.), the potential of a large hydrocarbon spill into the aquatic/wetland environment is insignificant.

#### **5.4.5.10 Monitoring**

Routine monitoring of mitigation structures such as filter fabric placement, culvert installations, buffer zones, fuel containment systems, fuelling stations is mandatory.

Table 5.11. Residual Impact Summary of the proposed undertaking upon Fish and Fish Habitat within the Amendment Areas.

<b>Fish and Fish Habitat</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>d</sup>						
Residual Impacts										
Significance	N-M	NA	NA	N-N						
Geographical Extent	1 <sup>b</sup>	NA	NA	1						
Duration of Interaction	3	NA	NA	1						
Frequency of Occurrence	4 <sup>c</sup>	NA	NA	1						
Level of Confidence	3	NA	NA	3						
Irreversible Impacts	No	NA	NA	No						
<p><b>Irreversible Impacts</b> None identified.</p>										
<p><b>Monitoring</b> Routine monitoring of mitigation structures such as filter fabric placement, culvert installations, buffer zones, fuel containment systems, fuelling stations is mandatory.</p>										
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> <tr> <td> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td></td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>	<p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	
<p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>								
<p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>									

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - potential distance of disturbance during culvert installation.

<sup>c</sup> – a total of 10 crossings in approximately 20 weeks of construction activities.

<sup>d</sup> – refers to a fuel spill event.

### 5.4.6 Resource Road Construction

The Guidelines require a description of: ***“The potential effects of the undertaking as related to:***

- ***The construction of resource roads which may result in increased access and effects (e.g., poaching, etc.) on remaining resources including those items listed in Section 4.0.”***

The potential effects of road construction have been addressed for each issue/concern in the other sections where applicable, therefore the discussion here is limited to a brief consideration of the effects of increased access, and the measures proposed or in place to reduce negative effects.

#### 5.4.6.1 Increased Access

In total, 5km of new road are proposed for the Main River Amendment Area and a total of 8km of new road are proposed for the East Sheffield Lake Amendment Area.

Within both areas, existing roads are present. East Sheffield Lake is a continuation of harvesting and the proposed roads are divided into two separate areas within the Amendment Area. Increased road access into each of these areas would be approximately 2km (Figures 2.3 & 2.4).

The Main River Amendment Area has existing roads in place. The proposed roads are finger roads off the existing main road into areas which require increased access for wood extraction. The maximum road length is approximately 2km within the Amendment Area. These new roads are not considered to increase access into the area significantly.

#### 5.4.6.2 Issues and Concerns

If a woods road is built in the vicinity of Leslie Lake, access to the lake by regional residents could increase. This could increase the limited recreational fishing effort now taking place in the area.

It would also diminish the sense of “wilderness” that clients of the Parson Pond hunting lodge wish to experience. If the woods are cut to the shore line, this would also diminish the wilderness experience of the clients of the hunting lodge.

Increased woods roads in the proposed Amendment Areas would likely increase access to the region by both recreational and tourist snowmobilers.

Increased access could result in increased consumptive activities (hunting, fishing, but not trapping), including both licensed and illegal activities (eg. poaching).

#### 5.4.6.3 Mitigation Measures

Adequate buffer zones will be left around Leslie Lake. CBPP staff have met with the owners of Parsons Pond Outfitters and, as a result of that discussion, the road route has

been altered to reduce potential intrusive use of Leslie Lake. Consideration will be given to blocking the road in the vicinity of Leslie Lake once the company no longer requires it for cutting and transporting of wood. A review will be carried out in consultation with the owners as well with respect to modifying cutting plans so as to maintain existing view lines from the lodge in order to help preserve the “wilderness experience” of the lodge.

#### **5.4.6.4 Residual Impact**

The short (2km) stretches of road do not provide significantly increased access to new recreational or harvesting areas, nor do they link together any major transportation corridors. Consequently the increased access is predicted to have a **minor (not significant) residual impact**.

### 5.4.7 Wildlife

The Guidelines require: ***“Environmental effects should focus on but not be limited to addressing the environmental components listed in the Section 4.0.***

Wildlife resources were assessed with respect to the above requirement. Wildlife resources include:

- Migratory birds
- Raptors
- Caribou
- Moose
- Upland game
- Furbearers
- Non-consumptive avifauna.

#### 5.4.7.1 Existing Conditions

See Sections 4.8 and 4.9 for a description of the existing wildlife conditions and species which may utilize the Amendment Areas.

#### Ecological Boundaries

See Section 5.1.5. The potential boundary of interaction is the Main River and East Sheffield Lake proposed Amendment Areas. Particular boundaries for specific wildlife resources are listed below, if different than that identified in Section 5.1.5.

#### Waterfowl

Waterfowl habitat within the amendment boundaries is considered to be the marshes, ponds, lakes and flowing water. Activities required for the undertaking will not take place within waterfowl habitat in the Amendment Areas, with the exception of possible road crossings over flowing water. However, all habitat within the amendment boundaries is considered in this assessment. The Big Steady on Main River is approximately 10km away from the Main River Amendment Area and is not part of this assessment. Both the Main River and East Sheffield Lake Amendment Areas are included in the assessment boundary.

#### Caribou

Caribou from the Upper Humber and Northern Peninsula herds are known to potentially occupy most of the Northern Peninsula at some time during their seasonal migrations. The potential boundary of interaction is the Main River and East Sheffield Lake Amendment Areas which are within this ecological boundary.

#### 5.4.7.2 Impact Significance Criteria

See Section 5.1.5.

### 5.4.7.3 Potential interactions

See Section 5.1.5. In addition to those outlined in Section 5.1.5, specific potential interactions related to each wildlife resource are listed below.

#### **Migratory Birds**

Potential interactions include the interruption and possible decrease in breeding and brood success as a result of excessive noise levels and/or an accidental hydrocarbon spill into the aquatic environment. Increased hunting/poaching pressure due to increased access may also occur.

#### **Caribou**

Other potential interaction between the undertaking and the Upper Humber and Northern Peninsula caribou herds is the disruption of migration routes between Summer and Winter grounds due to noise and/or human presence.

#### **Other Wildlife (Raptors, Moose, Upland Game, Furbearers, Non-consumptive avifauna)**

Other potential interaction between the undertaking and other wildlife is the disturbance of animals due to noise and human presence. Increased trapping pressure on furbearers may also result due to increased access.

### 5.4.7.4 Identified Issues and Concerns

Specific concerns outlined with respect to the wildlife species that may be affected by the undertaking was the potential increased hunting/poaching pressure and the potential loss of forest habitat for forest birds such as the Ovenbird that may be present in the Amendment Areas.

While no other specific concerns were expressed as part of the Guidelines, the issue is assumed to be the potential residual environmental effects of the undertaking upon the species in question.

### 5.4.7.5 Existing Knowledge

#### **Migratory Birds**

The Canada Goose is a large plant-eating bird which nests in open places near water. Palmer (1976) states that in Spring these geese seek remote areas, free from disturbance, for nesting. In general, they prefer nest sites that provide clear views in all directions, and permanent water not far away. Nest sites tend to be higher and drier than the surrounding country-side. Canada Geese are very selective about nest sites (Palmer 1976). Very little suitable habitat exists elsewhere in the Main River area outside Big Steady, although isolated pairs may nest throughout (Northland Associates 1986). Meadowlands near water are highly preferred for nesting and feeding.

Black ducks are medium-sized dabbling ducks that make greater use of woodland habitat than other *Anas* species (Palmer 1976). They are fairly adaptable when selecting habitat but nest in low densities. Therefore, extensive areas of suitable habitat are needed to support moderate numbers of breeding pairs. Besides Big Steady, such expanses of habitat were identified as lacking in the Main River study area (Northland Associates 1986). It is therefore suggested that Black Ducks could utilize the ponds within both Amendment Areas, however, utilization would be expected to be low.

The Green-winged Teal is the smallest of the dabbling ducks found on the Island. Its preferred habitat is a mixture of grassy and sedgy terrain plus brush or scattered trees, usually not distant from water (Palmer 1976). In barren country, the Green-winged Teal will nest in open areas with patches of low deciduous growth near water. Green-winged Teal could nest in small numbers in many parts of the Main River (Northland Associates 1986) and East Sheffield Lake areas.

Greater/Lesser Scaup are thought to have the potential to increase in number on the Island. They prefer grass-margined waters, floating shorelines and islands, and seasonally flooded river deltas. These species may utilize the water in the Amendment Areas, however, utilization is expected to be minimal.

Ring-necked Ducks are medium-sized diving ducks. They prefer sedge marches and ponds with emergent vegetation. They will nest in forested areas and prefer to feed in shallower water than most divers. Brushy hummocky and floating islands are preferred for nesting sites. Ring-necked ducks could make use of the wooded ponds within the Amendment Areas.

### **Raptors**

Raptors in close proximity to construction can be affected by the disturbances created. Raptors will usually avoid areas of human presence and activity (Stalmaster 1987; Nelson 1979). However, there have been some reports of raptors continuing normal activities in areas of construction or human disturbance (reviewed in Nelson 1979). Stalmaster and Newman (1978) reported that bald eagles can tolerate and habituate to some levels of activity.

### **Caribou**

Activities associated with construction (eg. Heavy equipment, blasting, and human presence) may affect caribou. Caribou may avoid habitat where levels of noise and human/equipment activities are high. Such a reaction is considered temporary, since caribou tend to habituate quickly to disturbance (VBNC 1997). A review of the effects of industrial activities and transportation corridors on the demography, movement, and behaviour patterns of eight caribou populations concluded that caribou can withstand periodic severe disturbance without long-term adverse effects on productivity and survival (Bergerud *et al.* 1984). Caribou seem to be most sensitive to noise disturbance during the calving period, with cows and calves being the most sensitive groups (Calef and Lortie 1973; Harrington and Veitch 1992).

Caribou avoided, or showed reduced use of areas when construction activity was taking place in the Upper Salmon hydroelectric project (Hill 1985). Following construction of this project and the Hope Brook gold mine, caribou occupation of adjacent habitat in



these areas returned to approximate pre-development levels (Upper Salmon) or showed some recovery toward pre-development levels (Hope Brook) (Tucker and Mahoney 1990). While roads and other linear structures can block or deflect caribou movement, the principal avoidance stimulus is the presence of people or vehicle traffic, rather than the constructed features themselves (Klein 1980; Shideler *et al.* 1986).

### **Moose**

Moose (*Alces alces*) were introduced to Insular Newfoundland at the turn of the century and have since occupied most of the Island. Their preferred habitat is coniferous forest, especially near swamps and lakes in areas of secondary growth (Hydro 1999). The Summer diet consists of aquatic vegetation, broad-leaved trees, shrubs and grasses, while Winter conditions necessitate feeding on balsam Fir and the bark of various trees (Northcott 1974).

Construction activities have the potential to cause adverse impacts to moose. Cow-calf pairs may be particularly sensitive to human disturbance. Experience with some development suggests that these impacts may not be significant. Sopuck *et al.* (1979) reported that among ungulates, moose are relatively tolerant of disturbance, although they avoid heavily used roads and areas of intense activity. Such avoidance is usually temporary, as moose have been observed to habituate to disturbance (Geist 1980; Sopuck and Vernam 1986).

### **Upland game**

As stated in Section 4.9, Ruffed Grouse, Spruce Grouse, Willow ptarmigan, and Snowshoe Hare inhabit conifer forests in various stages of successional growth and most prefer areas of early successional growth.

During periods of cyclic abundance, populations of upland game can build to very high numbers. The early successional stages of vegetation resulting from clear-cutting or road right-of-way clearing are favoured feeding areas for many upland game (Northland Associates 1986).

### **Furbearers**

The effects of development and human disturbance on furbearers are difficult to study due to low or fluctuating population numbers and their wide ranging movements (Sopuck *et al.* 1979). In general, however, furbearers tend to avoid areas of development and human activity. A possible exception to this general statement is the red fox, which has been shown to by several studies to frequent areas of disturbance (Sopuck *et al.* 1979).

Aquatic furbearers such as mink, otter, and beaver could experience intestinal damage due to the ingestion of oil during grooming and through ingestion of tainted fish (Geraci and St. Aubin 1990). Studies on aquatic furbearer species have found oil exposure to result in thermal conductivity of coats after exposure to oil (see Geraci and St. Aubin 1990).

In general, furbearers benefit from Fire due to the renewed vigour of well fertilized plant succession and subsequent prey density increase that occurs following a fire (Kelsall *et al.* 1977).

### **Non-consumptive avifauna**

Some species of woodland avifauna prefer mature forest structure, eg. the Ovenbird (*Seiurus aurocapillus* Linnaeus) and therefore any loss of mature forest would represent a loss of habitat. Since some of these birds also require interior forest (i.e. large enough forested areas so that they are not near an edge), remaining forest blocks must be of an appropriate size in order to ensure their utilization by these species (Whitaker 1997).

#### **5.4.7.6 Impact Analysis**

See Section 5.1.5 for potential interactions between wildlife and the proposed activities.

### **Migratory Birds**

With the leaving of appropriate buffers around watercourses, and marshy areas being avoided for road construction and harvesting, impact would be negligible with respect to habitat loss.

### **Raptors**

Revegetation may also affect raptors as successional growth continues after harvesting, however, activities involved with it are not likely to cause an impact. Revegetation would be considered a positive effect as prey bases increase within a successional forest structure.

### **Caribou**

Since the majority of the necessary roads in the Main River Amendment Area are existing, the amount of construction required is minimal. The total area proposed to be harvested represents a very small quantity of caribou habitat (less than 0.1%) of the Humber and Northern Peninsula herds.

### **Moose**

Revegetation as the area goes through successional stages may benefit (positive impact) moose populations; conversely harvesting activities are not likely to cause any negative impact.

### **Upland game**

Revegetation may also affect upland game populations (positive impact) as successional growth continues after harvesting; conversely harvesting, activities are not likely to cause any negative impact.

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## **Furbearers**

Revegetation may also benefit furbearers as successional growth continues after harvesting.

A potential increase in trapping pressure in the Main River Amendment Area is not a concern since the area is part of the Gazetted no-trapping area around Main River (see Section 4.2 Pine Marten). Limited new road construction within the East Sheffield Lake Amendment Area would also have a limited affect as increased access could result in slightly greater levels of trapping.

## **Non-consumptive avifauna**

Revegetation will also benefit non-consumptive avifauna (positive impact) as successional growth continues after harvesting. Conversely, harvesting activities are not likely to cause any negative impact. These Amendment Areas represent a very small portion of similar existing forest structure in the general area.

### **5.4.7.7 Mitigation**

Routine mitigation techniques as outlined in Mercer (1988) will be implemented to reduce possible negative effects on all wildlife species. These techniques include emergency preparedness measures to reduce hydrocarbon spill potential and forest fires.

Hydrocarbon containment systems and dedicated fuelling stations will be used within the Amendment Areas to eliminate the possibility of a hydrocarbon spill into the existing waterways. These mitigation techniques will be as per all applicable regulations and CBPP's FMPOP.

CBPP's District Operations Supervisors are responsible for the allocation and testing of Fire suppression equipment on all work sites in their respective areas, as well as the establishment of reserve supplies of equipment for use during a major outbreak. At the startup of each session, the Operations Superintendent will do an inspection of each jobsite in his District to determine whether adequate fire suppression equipment is on hand. During the off season, all equipment will be taken by the Contractor to a safe, dry location for storage. Any Contractor who has been assigned fire equipment by CBPP is responsible for maintenance, as well as replacement of any missing equipment.

Prior to the start of the fire season, CBPP will submit maps to the Newfoundland Forest Service showing the locations of operating areas, as well as lists detailing the fire suppression equipment established at each location. These mitigation techniques will be as per all applicable regulations and CBPP's FMPOP.

Outlined below are specific mitigations for each wildlife resource.

## **Migratory Birds**

Unmerchantable softwood, hardwood stands, and all scrub within the proposed Amendment Areas will not be harvested. In addition, leave-zones (buffers) of forest will

be left around all watercourses >1m wide. These buffers are a minimum of 20m in width. A minimum 50m buffer will also be left next to Big Brook.

### **Raptors**

Habitat requirements for raptors such as the boreal owl, American Kestrel and sharp shinned hawk, would be accommodated by leaving wildlife trees in the form of green trees or snags, as outlined in the FMPOP (Mercer 1998), and by leaving blocks of contiguous mature forest for other wildlife species such as Marten, moose and caribou. Some raptors such as great Horned Owls, northern hawk owls and merlins use deserted nests made annually by other common species such as crows. Buffering of such structures will not be required except where nesting raptors are encountered during logging operations. When nesting raptors are encountered, a protective buffer of 800m will be retained until July 31 when young are likely to be fledged.

Other mitigation techniques for raptors include:

- The location of any raptor nest site must be reported to the Wildlife Division;
- Because eagles and ospreys utilize the same nest year after year, a protective buffer of 200m will be established around nest sites of these species. When operations are scheduled during the nesting season (March 15 to July 31) harvesting will not occur within 800m of the nest; and
- Forest access roads, borrow pits and quarries must also avoid eagle and osprey nest sites.

### **Caribou**

Mitigation techniques for the reduction of negative impacts to caribou have been incorporated into the FMPOP (Mercer 1988). These techniques include:

- Slash should be maintained on sites to provide caribou with an opportunity to access lichens from the branches of harvested trees;
- In areas where caribou utilize arboreal lichens during the Summer and/or Winter and terrestrial lichens during the Summer, a minimum amount of lichen forest must be maintained to facilitate the continued use of these areas by woodland caribou. Forest activity will be designed in consultation with the Wildlife Division where this situation has been identified;
- Special consideration will be given to known calving and Wintering areas. This may include modifications to road locations and restricted activity during certain seasons. Harvesting for example, is not permitted within caribou calving areas from May 15- June 15 or within post-calving areas from June 15 to July 31. These areas would be identified by the Wildlife Division.

### **Moose**

Mitigation techniques for the reduction of negative impacts to moose have been incorporated into the FMPOP (Mercer 1988). These techniques include:

- Where established moose yards have been identified, forest access roads, borrow pits and quarries must not be located within 1km;
- Small isolated stands of timber on bogs will be retained as security cover; and

- Where important habitats are identified (eg. Moose Wintering yards) a special effort will be made to protect these areas through the development of modified harvesting practices such as leave blocks or buffers which incorporate the important habitat. The size of the leave blocks will reflect natural stand boundaries.

### Upland game

No mitigation techniques have been identified for upland game specifically by CBPP or DFRA (Merver 1998). However, where snowshoe hare are identified as the primary species for which an area is being managed, the following guidelines apply (Mercer 1988):

- The size and configuration of cut harvest blocks will reflect the natural stand boundaries. Harvest cutblock size should not exceed 25 hectares;
- Special consideration will be given to maintaining security cover adjacent to harvest blocks. Stands between the ages of 10-30 years provide optimal security cover; and
- In areas where pre-commercial thinning occurs, special consideration will be given to maintaining unthinned areas adjacent to, or within, thinned areas.

### Furbearers and Non-consumptive avifauna

No specific mitigation techniques have been identified for furbearers and non-consumptive avifauna by CBPP or DFRA. However, wildlife considerations are outlined in CBPP's FMPOP. CBPP cooperates with the Newfoundland Wildlife Division and other wildlife management agencies to ensure that forest operations are carried out in a manner that maintains adequate habitat for all wildlife (Mercer 1998). The following general planning principles guide CBPP when developing forest management plans with respect to wildlife habitat (Mercer 1988):

- Development of area specific criteria for harvest cutblock size, shape and spatial arrangement;
- Development of area specific criteria of residual vegetation and cover within harvest blocks;
- Maintenance of treed buffers adjacent to riparian habitats; and
- Provision of travel corridors across the landscape.

#### 5.4.7.8 Residual Impact Analysis

##### Migratory Birds

Table 5.12 summarizes the residual impact predictions of the proposed undertaking on the migratory birds that would most likely be found within the amendment area boundaries. Since migratory bird habitat is located within the Amendment Areas outside the merchantable wood (bogs, marshes, and watercourses), a **negligible (not significant) residual environmental impact is predicted**.

##### Raptors

Table 5.13 summarizes the residual impact predictions of the proposed undertaking on the raptors that may be in the area of the amendments. A **minor (not significant) residual environmental impact is predicted**. This effect includes the positive effect of

the secondary growth as food and cover for some species. The Amendment Areas are a small portion of the overall forest structure that will remain unharvested within the Main River Reserve boundary and the Pine Marten Study area.

### **Caribou**

Table 5.14 summarizes the residual impact predictions of the proposed undertaking on the caribou herds of the northern Peninsula. A **negligible (not significant) residual environmental impact is predicted** upon the caribou populations since most caribou movement and overwintering tends to occur to the west of the Amendment Areas.

### **Moose**

Table 5.15 summarizes the residual impact predictions of the proposed undertaking on the moose population of the northern Peninsula. A **minor (not significant) residual environmental impact is predicted** upon the moose populations. This effect also includes the positive effect of the secondary growth as food for moose.

### **Upland game**

Table 5.16 summarizes the residual impact predictions of the proposed undertaking on the upland game populations in the area of the amendments. A **minor (not significant) residual environmental impact is predicted**. This effect includes the positive effect of the secondary growth as food and cover for upland game.

### **Furbearers**

Table 5.17 summarizes the residual impact predictions of the proposed undertaking on the furbearer species in the area of the amendments. A **minor (not significant) residual environmental impact is predicted**. This effect includes the positive effect of the secondary growth as food and cover for some species.

### **Non-consumptive avifauna**

Table 5.18 summarizes the residual impact predictions of the proposed undertaking on the non-consumptive avifauna that may be in the area of the amendments. A **minor (not significant) residual environmental impact is predicted**. This effect includes the positive effect of the secondary growth as food and cover for some species. The proposed Amendment Areas are a small portion of the overall forest structure that will remain unharvested, and therefore constitutes a minor portion of the available habitat.

Table 5.12. Residual Impact Summary of the proposed undertaking upon the Migratory Birds that utilize the Amendment Areas.

<b>Migratory Birds</b>	Construction Activities	Operation Activities	Revegetation <sup>b</sup>	Accidental Events <sup>c</sup>						
Residual Impacts										
Significance	N-N	N-N	NA	N-N						
Geographical Extent	NA <sup>a</sup>	NA <sup>a</sup>	NA	1						
Duration of Interaction	3	3	NA	1						
Frequency of Occurrence	5	5	NA	1						
Level of Confidence	3	3	NA	3						
Irreversible Impacts	No	No	NA	No						
<p><b>Irreversible Impacts</b> None identified.</p>										
<p><b>Monitoring</b> Routine monitoring of mitigation structures such as filter fabric placement, culvert installations, buffer zones, fuel containment systems, fuelling stations is mandatory.</p>										
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> <tr> <td> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td></td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>	<p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	
<p><b>Significant:</b> SM Major Sm Moderate <b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>								
<p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>									

<sup>a</sup> road construction and harvesting would not occur within wetland/waterways, therefore, impact summary more relates to noise disturbance.

<sup>b</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>c</sup> - refers to a fuel spill event.

Table 5.13. Residual Impact Summary of the proposed undertaking upon raptors that utilize the Amendment Areas.

<b>Raptors</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-M*	N-M*	N-M*	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	6	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b> Potential raptor nests will be identified and appropriate mitigation conducted.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.



Table 5.14. Residual Impact Summary of the proposed undertaking upon the caribou herds that utilize the Amendment Areas.

<b>Caribou</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-N*	N-N*	N-N	N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b> No specific caribou monitoring is identified.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

Table 5.15. Residual Impact Summary of the proposed undertaking upon moose that utilize the Amendment Areas.

<b>Moose</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-M*	N-M*	N-M*	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b> No specific monitoring programs are scheduled or anticipated.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

Table 5.16. Residual Impact Summary of the proposed undertaking upon upland game that utilize the Amendment Areas.

<b>Upland Game</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-M*	N-M*	N-M*	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b>            If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b>            None outlined</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p> </td> <td> <p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p> </td> <td> <p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p>	<p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p>	<p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p>
<p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p>	<p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p>	<p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

Table 5.17. Residual Impact Summary of the proposed undertaking upon furbearers that utilize the Amendment Areas.

<b>Furbearers</b>	<b>Construction Activities</b>	<b>Operation Activities</b>	<b>Revegetation<sup>a</sup></b>	<b>Accidental Events<sup>b</sup></b>			
<b>Residual Impacts</b>							
Significance	N-M*	N-M*	N-M*	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b> Routine monitoring of mitigation structures such as filter fabric placement, culvert installations, buffer zones, fuel containment systems, fuelling stations is mandatory. No specific monitoring of furbearer species (other than Pine Marten) is outlined or proposed.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire and/or fuel spill event.

Table 5.18. Residual Impact Summary of the proposed undertaking upon non-consumptive avifauna that utilize the Amendment Areas.

<b>Non-consumptive Avifauna</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-M*	N-M*	N-M*	N-N			
Geographical Extent	2	4	4	2			
Duration of Interaction	3	3	5	1			
Frequency of Occurrence	5	5	5	2			
Level of Confidence	3	3	3	3			
Irreversible Impacts	Yes	No	No	No			
<p><b>Irreversible Impacts</b>            If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long-term; indirect).</p>							
<p><b>Monitoring</b>            No specific monitoring of avifauna species is outlined or proposed.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p> </td> <td> <p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p> </td> <td> <p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p>	<p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p>	<p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p>
<p><b>Significant:</b>                SM Major                Sm Moderate</p> <p><b>Not Significant</b>                N-M Minor                N-N Negligible                N/A Not Applicable                * = indirect</p> <p><b>Frequency:</b>                1 = &lt;1 event per decade                2 = yearly &lt; decade                3 = monthly &lt; yearly                4 = daily &lt; monthly                5 = continuous</p>	<p><b>Extent:</b>                1 = &lt;1 ha                2 = 1 ha &lt; 1 km<sup>2</sup>                3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup>                4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup>                5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b>                1 = low                2 = moderate                3 = high</p>	<p><b>Duration:</b>                1 = &lt;1 week                2 = 1week &lt; 1 month                3 = 1 month &lt; 1 year                4 = 1 &lt; 10 years                5 = ≥ 10 years</p>					

<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire event.

#### **5.4.7.9 Accidental Events**

Accidental events are identified as primarily hydrocarbon spills and forest Fires.

An accidental hydrocarbon spill would have the potential to have a serious negative effect upon the wildlife within the Amendment Area and downstream of the Amendment Area, if a spill was of sufficient size. This would be particularly true for aquatic animals such as migratory birds and some furbearers. Data regarding spills in FMD 16 indicate that no large spills have been reported. The frequency of such a spill would therefore be very small. With mitigation measures to prevent the loss of hydrocarbons into the environment (self-containing fuelling systems, dedicated fuelling locations, spill containment equipment, etc.), the potential of a large hydrocarbon spill into the environment is insignificant.

As discussed in Section 5.4.1.10 (Pine Marten), a large-scale forest Fire would have the potential to create a significant impact on the wildlife habitat in the Main River and East Sheffield Lake areas. However, with the current mitigation techniques utilized by CBPP during harvesting activities, forest Fire is very unlikely.

#### **5.4.7.10 Monitoring**

Routine monitoring of mitigation structures such as filter fabric placement, culvert installations, buffer zones, fuel containment systems, fuelling stations and Fire suppression equipment is mandatory. Unless specified, no specific monitoring programs are scheduled or anticipated.

Specific monitoring includes Raptors during activities in the area and will consist of identification of raptors and potential nesting sites. In addition, Pine Marten monitoring which will be conducted as part of the Pine Marten Study (as well as any associated prey-based surveys/monitoring).

### 5.4.8 Cumulative Effects

The Guidelines require a description of: ***“the cumulative effects that may or have resulted from all forest harvesting operations in District 16, including previous amendments to the current five-year operating plan.”***

While a primary objective of CBPP's forest management is to provide a sustainable supply of high quality raw materials to the mill at a competitive cost, CBPP recognizes that forests offer a multitude of economic, environmental, and social values and benefits. CBPP is committed to managing the forests under its stewardship in a sustainable manner to ensure the full range of forest values and benefits are respected. The Company's initiative of developing a forest management system that meets the requirements of a system such as ISO 14000 Series or the CSA Standard for SFM Certification demonstrates its commitment to sustainable forest management.

The Forestry Act of 1990 signaled the Province's shift from single resource management to ecosystem-based management of the province's forests, a strategy that focuses on ecological principles. This provincial initiative, together with national and international initiatives, provides direction for implementing ecosystem based management. These initiatives also provide the framework for CBPP in initiating and implementing ecosystem-based management within its sustainable Forest Management Plan.

A wide range of values are associated with forested lands, including environmental, social, and economic. Under ecosystem-based management, forest management activities strive to recognize and maintain the integrity of these values. Considerable effort must be directed to ensure that timber harvesting, together with forest renewal programs, not only result in a sustainable supply of timber, but also sustain all forest values.

Ecosystem-based management recognizes that knowledge of forest ecosystem structure and function is paramount, and requires appropriate input into the planning process from stakeholders. As a relatively new and evolutionary approach, this process of adaptive management will strive to meet objectives of sustainable forest management.

This proposed amendment to the Five Year Operating Plan, (as well as the two previously approved see Section 2.0) have all been within the current allowable AAC set by the DFRA. They do not represent additional wood supply. Therefore, sustainable management of the forests is maintained.

### **Fish and Fish Habitat**

Culvert installation and stream crossing maintenance can result in erosion and sedimentation phenomena. As well, poor culvert design and installation practices can produce habitat disruption and migration barriers. Guidelines are available for proper design, installation and maintenance of stream crossing facilities, and these have been incorporated into CBPP practices.

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CBPP is committed to protecting fish habitat, particularly sensitive areas such as spawning and rearing grounds, in order to prevent cumulative effects throughout its harvesting areas. The following practices are highlighted:

- properly planned and constructed roads and stream crossings;
- properly planned and located harvest blocks, landings and proper logging practices; and
- establishment of treed buffers adjacent to watercourses all as described in the FMPOP (Mercer 1998).

The protection and management of riparian zones is an important component of forest management and planning. A primary management tool employed by CBPP to protect riparian and aquatic habitat is the maintenance of treed buffers adjacent to watercourses. Treed buffers serve a variety of functions including:

- filter strips to capture sediment and organic matter from entering a watercourse from adjacent disturbed land;
- maintenance of water temperature, in rivers and streams;
- maintenance of wildlife habitat and wildlife habitat corridors; and
- maintenance of aesthetic quality.

Using CBPP's buffer classification system (see Section 5.4.5.7), rather than the prescribed minimum 20m (plus slope factor) of Scruton et al. (1997), the buffer along Big Brook will be a minimum 50m wide. In areas where harvesting may be difficult or not feasible, the entire area below the permanent road that borders Big Brook will not be harvested. This was determined as a result of the spawning and rearing potential of Big Brook and the lower section of Main River. It also provides added protection to the main stem of Main River.

CBPP is committed to sustainable practices with respect to wood harvesting activities, including the maintenance and upkeep to roads and water crossings, prevention of erosion and sedimentation. Careful monitoring of re-growth to facilitate forest regeneration also has the effect of reducing erosion potential in areas of steep gradient and erodible soils. With respect to the proposed undertaking, the implementation of proper Environmental Protection Guidelines during road construction and harvesting activities will reduce effects on fish and fish habitat. As a consequence of these measures, the predicted cumulative effect of wood harvesting operations in FMD 16 is predicted to be **minor (not significant)**.



Table 5.19. Residual Impact Summary of the proposed undertaking upon cumulative forest harvesting operations.

<b>Cumulative</b>	Construction Activities	Operation Activities	Revegetation <sup>a</sup>	Accidental Events <sup>b</sup>			
Residual Impacts							
Significance	N-N	N-N	N-N	NA			
Geographical Extent	2	4	4	NA			
Duration of Interaction	3	3	5	NA			
Frequency of Occurrence	5	5	5	NA			
Level of Confidence	3	3	3	NA			
Irreversible Impacts	Yes	No	No	NA			
<p><b>Irreversible Impacts</b> If roads are left and/or maintained as public access and not revegetated, the 10.4ha of road surface will be a permanent loss of forested habitat (long term; direct).</p>							
<p><b>Monitoring</b> No specific monitoring of cumulative affects is outlined or proposed.</p>							
<p><b>KEY</b></p> <table> <tr> <td> <p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p> </td> <td> <p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p> </td> <td> <p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p> </td> </tr> </table>					<p><b>Significant:</b> SM Major Sm Moderate</p> <p><b>Not Significant</b> N-M Minor N-N Negligible N/A Not Applicable * = indirect</p> <p><b>Frequency:</b> 1 = &lt;1 event per decade 2 = yearly &lt; decade 3 = monthly &lt; yearly 4 = daily &lt; monthly 5 = continuous</p>	<p><b>Extent:</b> 1 = &lt;1 ha 2 = 1 ha &lt; 1 km<sup>2</sup> 3 = 1 km<sup>2</sup> &lt; 10 km<sup>2</sup> 4 = 10 km<sup>2</sup> &lt; 100 km<sup>2</sup> 5 = ≥ 100 km<sup>2</sup></p> <p><b>Confidence:</b> 1 = low 2 = moderate 3 = high</p>	<p><b>Duration:</b> 1 = &lt;1 week 2 = 1week &lt; 1 month 3 = 1 month &lt; 1 year 4 = 1 &lt; 10 years 5 = ≥ 10 years</p>
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<sup>a</sup> - refers to any silviculture works and re-growth of forest structure.

<sup>b</sup> - refers to a fire and/or fuel spill event.

## 6.0 PUBLIC PARTICIPATION

As per the Guidelines:

***“ A public information session shall be held in Corner Brook and advertised in the local media to present the undertaking and record public concerns. The protocol (attached) for this meeting shall comply with Section 11 of the Environmental Assessment Regulations.”***

Corner Brook Pulp and Paper conducted extensive public consultation to advise interested parties about the undertaking, and to identify issues and concerns. The company has complied with the Guideline requirement for a public information session in Corner Brook, and followed the protocol for public notification as per Section 11 of the Environmental Assessment Regulations 1984.

In addition, CBPP carried out other related initiatives, including the holding a meeting in Sop's Arm with the White Bay IAS (Industrial Adjustment Services) Committee, and an initial open house meeting in Corner Brook.

As a result of these initiatives, the company received comments from various individuals and organizations. In addition, relevant correspondence to the Minister of Environment and Labour has been received from the Chair of the Assessment Committee. The nature and extent of the consultations are listed below. A consolidation of all issues and concerns received to date is summarized in Section 6.3.

### 6.1 PUBLIC INFORMATION SESSION

An open house style meeting was held in Corner Brook on March 22, 2000, from 4:00pm to 8:00pm, following the provision of public notification as required by the Regulations.

#### 6.1.1 Public Notice

The Minister was provided with written notice fifteen days prior to the session and the public was notified of the session through newspaper advertisements which were placed in the Western Star on March 18, 19, 20 and 21, 2000 and in the Humber Log on March 15, 2000. The ads (Appendix C) contained the required information, and were sized to two column widths. Posters were also prepared (size 8.5" X 11") and placed in the Corner Brook Town Hall and the Post Office over a period of one week prior to the Open House. The posters were checked daily, and replaced as necessary. In addition, radio announcements were placed on the private and public AM stations serving the community (CBC and CFCB). Finally, notices were faxed to concerned individuals and organizations (e.g. SAEN, SPAWN, Humber Environmental Action Group).

#### 6.1.2 Format

The public information session was an open house style, using a large meeting room area in the Glynmill Inn.. Resource people for the Open House included six from Corner Brook Pulp and Paper Ltd. and three from AGRA Earth & Environmental. Resource materials include a greeting/registration table, and three panel displays. At the greeting

table, participants were provided with a brief description of the displays, asked to sign a registry, and provided a handout sheet describing the project. Upon departure, participants were thanked for their interest and requested to fill out a questionnaire. Appendix C contains copies of the handout and the questionnaire.

The three display panels provided text and map display information. One Panel focused on a description of the proposed harvesting activity; the second addressed the rationale and need for the Amendment; and the third described the environmental issues which had been identified to date. In addition, a wall map was prominently displayed showing Forest Management Areas 14,15 and16. At each Panel, one or two resource people were present to explain the display material and to answer questions.

### **6.1.3 Results**

Based on the signed registration, a total of 31 individuals attended the open house, of 14 filled out the questionnaire.

In signing the visitors book, the participants listed themselves as: citizens (12); members of environmental/outdoor organizations (4); Sir Wilfred Grenfell College (4), College of the North Atlantic (students – 3); government (3), and four did not specify an affiliation.

Of the 14 individuals who completed the survey, most learned of the open house through the media (newspaper - 4; radio/television - 4; poster - 1; friend – 3; other – 2). The majority of participants were from Corner Brook (11; two from Bonne Bay area; one from Pasadena).

All of the respondents reported that they found the information presented to be useful (very useful –1; somewhat useful 13). No one commented that they found the information to be lacking or not informative. Two of the 14 added that they had received sufficiently good information to answer all their questions.

All concerns/issues/questions registered on this survey are summarized and addressed in section 6.3 below.

## **6.2 OTHER PUBLIC CONSULTATIONS**

Two other meetings were held by CBPP. A meeting was held with the White Bay South IAS Committee on March 16, 2000 in Sops Arm, and a March 08, 2000 Open House was held in Corner Brook, also at the Glynmill Inn.

The IAS meeting was attended by fourteen residents of the area, plus representatives of CBPP and a Planner from Parks and Natural Areas Division of the Province. Issues discussed included: the background, criteria and status of the Main River Canadian Heritage River proposal; harvesting activities by CBPP to date in the White Bay area; and CBPP plans for the future in that area. At the meeting representatives of Corner Brook Pulp and Paper distributed a handout on the proposed amendment.

The March 08 Open House was similar to the session reported above. It was attended by 84 participants, of whom 32 filled out survey sheets. As with the March 22 meeting, the majority were from Corner Brook (20/32); most learned about the meeting through the media (17/32), and most (28/32) found the session to be somewhat to very useful.

All issues and concerns listed on these questionnaires are summarized and addressed in section 6.2.

Other public interaction has included a CBC radio interview held with Mr. Matt Churchill and addressing the proposed Amendment. An offer was also made to meet with a number of individuals who identified themselves as members of a “coalition” of organizations concerned about the proposed undertaking. The Minister has also received a number of letters from concerned individuals and organizations. These have been forwarded to CBPP by the Chair of the Assessment Committee, and the contents incorporated into the identification of issues (Section 6.3).

### **6.3 PUBLIC ISSUES AND CONCERNS**

A summary table (6.1) has been prepared to identify the set of issues and concerns expressed to date (March 27, 2000) through public participation in the environmental assessment process. The table also provides a commentary to the identified item, either as a response to the issue/concern, or by referencing the section of the EPR where relevant analysis is provided.

TABLE 6.1 PUBLIC ISSUES AND CONCERNS

Issue	Concerns	CBPP Response	
		EPR Reference	CBPP Comments
"Old Growth" Forest	-Unique Ecosystem threatened by proposed undertaking -Inadequate knowledge of the extent of this ecosystem -Over-mature timber should be harvested	4.7	-Relevant research is underway
Pine Marten	-Disruption of Pine Marten Study Area -Loss of Pine Marten Habitat	4.2 5.4.1	-Amendment is compatible with Study Area
Salmonids	-Habitat degradation through erosion, sedimentation -Inadequate Buffer Zones for streams, especially in spawning areas	5.4.5 5.4.5	-Effects reduced through EPP implementation and permit conditions. -Proposed Buffers include 50m or greater widths in sensitive areas
Main River CHRS Status	-Logging would hamper nomination  -Cutting would reduce wilderness value -The whole watershed should be preserved	5.4.2	-CHRS Board has accepted wood harvesting outside protected corridor.  -Issue was addressed in Upper Humber/Main River EIS
Water Quality	-Need for monitoring, especially for siltation	5.4.5	Effects reduced through EPP implementation.
Sustainable Development	-Preservation of natural biodiversity and ecosystem integrity threatened by clearcutting and succession processes -Forest management practices are not sustainable -Greater protection of commercial forest is required	2.2.5  4.7	-CBPP subscribes to sustainable forest management practices
Cumulative Effects	-Cumulative effects of wood harvesting practices should be considered, including forest fragmentation	5.4.15	-Cumulative effect of the proposed amendment areas has been considered
Gros Morne National Park	-Project will compromise ecosystems in the Park	4.1.1	-The amendment areas are over 30 km from the Park boundary (different ecoregion)
Outfitting and Tourism	-Proposed road too close to outfitters lodge -Adventure tourism business would be reduced	5.4.6	-Road route has been altered to avoid disruption -Disagree. Tourism has increased since roads were constructed into Main River
Project Description	-Need to see all new roads described on map -Upper Humber/Main River EIS is outdated -Objection to extreme chemical use  -Amendment proposed exceeds AAC -A labour dispute is not justification for amending the 5 year plan -Project will reduce environmental hazards associated with spring use of unsuitable roads, and as a result of delayed road construction. -The labour dispute justifies the need for the Amendment	2.2  2.2 3.1  3.0  3.0	-Many aspects of that document remain valid and relevant. -Proposal does not involve any extensive chemical use -AAC is not exceeded -CBPP disagrees  -Agreed  -Agreed
Public Consultation	-Full stakeholder consultation required (as for 5 year plan) -Information session needed in Sop's Arm -Information session needed in St. John's	6.0	-Extensive Public consultation is underway -Open meeting held with IAC in Sop's Arm
Economics	-Harvesting produces fewer jobs than in the past  -Economic reasons alone are inadequate justification for Amendment	3.0	-The change has been from short-term seasonal manual jobs, to year-round quality jobs. -Economics is only one reason to support proposed Amendment
Big Game	-Caribou will be displaced from woodland habitat  -Bear in the Sheffield Lake area will be affected	5.4.9	-Wood harvesting has minimal effect on caribou. -Minimal disruption likely

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- J. McCarthy Ph.D. candidate researching forest dynamics in the Main River area
- C. McCarthy Senior Park Warden, Gros Morne National Park
- J. Price Eastern Edge Outfitters, St. John's
- K. Reynolds Provincial Archaeology Office, Department of Tourism, Culture and Recreation
- G. VanDusen Forest Management Superintendent, Corner Brook Pulp and Paper Limited
- A. Vincent Lands Officer 11, Department of Government and Lands, Corner Brook
- C. Yates Manager, Outdoor Product, Department of Tourism, Culture and Recreation, St. John's