DISCUSSION PAPER

Socioeconomic Analysis Of Designating Wilderness Areas

DEPARTMENT OF ENVIRONMENT
PROVINCE OF NOVA SCOTIA

PROJECT NO. 1038026

REPORT NO. 1038026

REPORT TO

Protected Areas Branch
Environmental & Natural Areas
Management Division
Department of Environment
5151 Terminal Road
Halifax, NS
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ON

Socioeconomic Analysis of Designating Wilderness Areas within the Blue Mountain-Birch Cove Lakes, Ship Harbour Long Lake and Shelburne River Crown Parcels

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EXECUTIVE SUMMARY

The planning, designation, and management of Nova Scotia's Wilderness Areas (WAs) are the responsibility of the Department of Environment (NSE). This may be done in partnership with other agencies and through agreements with non-government organizations. In 1998, 31 areas were designated under the *Wilderness Areas Protection Act* (1998, c.27, amended 2005, c.56, s.18) (the Act). Two additional areas, Gully Lake and Eigg Mountain-James River WAs, were designated in 2005. In total, the 33 WAs protect approximately 295,400 hectares (ha), which represents approximately 5.3% of the land area of Nova Scotia. When all categories of legally protected land are considered, approximately 8.2% of Nova Scotia is protected.

The *Environmental Goals and Sustainability Act* (2007, c.7) focuses on the health of the environment, economy, and people of Nova Scotia. The legislation's major objective is for Nova Scotia to have one of the cleanest, most sustainable environments while achieving economic prosperity equal to or greater than the national average (Government of Nova Scotia 2008). In order to achieve this long-term objective, one of the Province's environmental goals is to ensure that 12 percent of the total land mass of Nova Scotia will be legally protected by 2015. To help meet this target, the province announced its intention to designate three new WAs on Crown lands.

Under Section 15(4) of the *Wilderness Areas Protection Act* (1998, c.27, amended 2005, c.56, s.18), before the designation of a WA,

> *"…a socioeconomic analysis of the impact of designation of a wilderness area shall be prepared for every wilderness area designated on Crown land after this Act comes into force…"*

This analysis is to be completed and made available to the public before a new designation is made. This study presents the results of the socioeconomic analysis. It considers a comprehensive range of social and economic benefits and costs that may be associated with designation, with the ultimate goal of providing decision-makers, stakeholders, and the public with the information to support informed discussion and judgment respecting the designation of protected WAs. The three Candidate Wilderness Areas (CWAs) under consideration are:

- Blue Mountain-Birch Cove Lakes (Halifax County);
- Ship Harbour Long Lake (Halifax County); and
- Shelburne River (Queens County).

Designated Wilderness Areas protect examples of Nova Scotia's varied landscapes, native biological diversity, and outstanding phenomena. They provide a protected land-base for scientific research, education, and a variety of recreational and nature tourism-related activities in a wilderness setting, including hiking, canoeing, kayaking, camping, sportfishing, hunting and trapping.

Designation of the Blue Mountain-Birch Cove Lakes, Ship Harbour Long Lake, and Shelburne River parcels as WAs will involve the loss of commercial forestry values and any mining values that may be associated with mineral rights not yet established (note that there will be no substantial effects on existing rights to develop mines). In addition to these prohibitions, the activities that may be considered

for restriction include the use of off-highway vehicles (*i.e.,* ATVs and snowmobiles), but it is important to note that no regionally-important connector trails were identified in this study that would be affected by designation for any of the CWAs. Available information indicates that some current users may be inconvenienced, but some of these impacts are largely associated with current illegal or unauthorized use. Thus, the actual impacts on vehicle users associated with designation are predicted to be small.

With designation of the three CWAs, the values that will increase include those associated with:

- Tourism;
- Research and education;
- Wilderness recreation;
- Cultural heritage;
- Existence;
- Climate change mitigation;
- Water regulation; and
- Biodiversity maintenance.

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1.0 INTRODUCTION

1.1 Wilderness Areas in Nova Scotia

The planning, designation, and management of Nova Scotia's Wilderness Areas (WAs) are the responsibility of the Department of Environment (NSE). This may be done in partnership with other agencies and through agreements with non-government organizations. In 1998, 31 areas were designated under the *Wilderness Areas Protection Act* (1998, c.27, amended 2005, c.56, s.18) (the Act). Two additional areas, Gully Lake and Eigg Mountain-James River WAs, were designated in 2005. In total, the 33 WAs protect approximately 295,400 hectares (ha), which represents approximately 5.3% of the land area of Nova Scotia. When all categories of legally protected land are considered, approximately 8.2% of Nova Scotia is protected.

The purpose of the Act is "to provide for the establishment, management, protection and use of wilderness areas, in perpetuity, for present and future generations, in order to achieve the following objectives:

- Maintain and restore the integrity of natural processes and biodiversity;
- Protect representative examples of natural landscapes and ecosystems; and
- Protect outstanding, unique, rare and vulnerable natural features and phenomena.

And the following secondary objectives:

- Provide reference points for determining the effects of human activity on the natural environment;
- Protect and provide opportunities for scientific research, environmental education and wilderness recreation; and
- Promote public consultation and community stewardship in the establishment and management of wilderness areas,

While providing opportunities for public access for sport fishing and traditional patterns of hunting and trapping" (s.2).

Activities such as wilderness recreation, nature tourism, environmental education and scientific research are encouraged. Sport fishing and traditional patterns of hunting and trapping are also generally permitted.

Designation of a WA places a number of restrictions on the use of the land (s.17 of the Act). For instance, commercial resource development, such as forestry and road development, is not permitted in a WA. Mineral exploration and mining is not permitted except where pre-existing, valid mineral rights are held. Where this is the case, activities associated with mineral exploration and/or development may be conducted, subject to standard environmental approvals, and under the terms of a license issued by NSE. Such activities may not contribute to degradation of the WA. New exploration licenses will not be issued.

Vehicle and bicycle use is generally prohibited in WAs, but may be permitted in limited circumstances, as outlined in the Act. Specifically, vehicle use may be approved on an existing trail or route through an agreement with a group or organization for trails that are essential links in a more extensive trail

network (s.23(4)), and bicycle use may be authorized on a designated trail or route (s.23(2)). Vehicle and bicycle use may also be authorized by a license or agreement to provide access:

- By private land owners whose land is surrounded by a WA (s.26);
- By researchers for scientific study (s.21);
- By campsite lease holders to access their lease sites (s.25(4));
- By recognized individuals or companies to use or maintain existing legal interests (s.25(4)); or
- By individuals for access to wilderness recreation, sport fishing, hunting or trapping (s.23(4)).

Current policy allows motorboat use in WAs by individuals with a valid fishing license for the purpose of sport fishing.

A number of other activities are also prohibited, except in certain circumstances, as outlined in the Act. For example, trails and related structures for wilderness recreation may be built and maintained within WAs, if approved under the Act. Camping and camp fires are permitted provided that campers abide by certain standards to minimize environmental impacts.

1.2 New Candidate Wilderness Areas

The *Environmental Goals and Sustainability Act* (2007, c.7) focuses on the health of the environment, economy, and people of Nova Scotia. The legislation's major objective is for Nova Scotia to have one of the cleanest, most sustainable environments while achieving economic prosperity equal to or greater than the national average (Government of Nova Scotia 2008). In order to achieve this long-term objective, one of the Province's environmental goals is to ensure that 12 percent of the total land mass of Nova Scotia will be legally protected by 2015. To help meet this target, the province announced its intention to designate three new WAs on Crown lands.

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> *"…a socioeconomic analysis of the impact of designation of a wilderness area shall be prepared for every wilderness area designated on Crown land after this Act comes into force…"*

This analysis is to be completed and made available to the public before a new designation is made. This study presents the results of the socioeconomic analysis. It considers a comprehensive range of social and economic benefits and costs that may be associated with designation, with the ultimate goal of providing decision-makers, stakeholders, and the public with the information to support informed discussion and judgment respecting the designation of protected WAs. The three Candidate Wilderness Areas (CWAs) under consideration are:

- Blue Mountain-Birch Cove Lakes (Halifax County);
- Ship Harbour Long Lake (Halifax County); and
- Shelburne River (Queens County).

More information on these CWAs is available on the NSE website at:

- http://www.gov.ns.ca/nse/protectedareas/wa_BlueMountainBirchCove.asp
- http://www.gov.ns.ca/nse/protectedareas/wa_ShipHarbourLongLake.asp
- http://www.gov.ns.ca/nse/protectedareas/wa_shelburneriver.asp

1.3 Socioeconomic Analysis of Wilderness Areas

What is a socioeconomic analysis of a CWA? As a first step, socioeconomic analyses generally seek to describe the current conditions of the study area, which may include documenting:

- The characteristics of the land use activities (*e.g.,* types of land use activities, land management, frequency and extent of land use, use patterns);
- The characteristics of the user groups (*e.g.,* distinct types of users, linkages between user groups and communities);
- The economic value of the current uses of the land (*e.g.,* the gross output and/or value added to the economy from forestry, mining, tourism, and recreation);
- The social, cultural and heritage values associated with the land; and
- Ecosystem service benefits provided by the area (*e.g.,* regulation of climate, atmospheric carbon sequestration, maintenance of biodiversity, *etc.*).

Having such information is often critical to making good decisions regarding the appropriate designation of a protected area and the development of effective and socially-accepted management plans.

In similar studies, a great deal of interest has focused on quantifying the economic values involved. A more traditional approach would be to examine more narrowly the commercial activities that use the land in question. This may typically include a description of the commercial revenues generated, the value added to the larger economy by the activities (GDP impact), and the direct and indirect employment.

More appropriately, one can broadly examine a more complete range of social values associated with the environment, working towards the development of a full accounting of the potential costs and benefits of designation. This means focusing not only on commercial uses, but also on the values that can be attributed to recreational uses, hunting and fishing, education and research (also known as information values), ecological services (*e.g.,* biodiversity maintenance, sequestration of atmospheric carbon dioxide, maintenance of water quality) and the existence of the protected area (*i.e.,* the values that people have for an area simply from knowing it exists, although they may never actually use the area). For a given study, the choice of which values to examine is driven by the specific policy needs for the study, and the socioeconomic and environmental context of the study site.

Descriptions of these various values can be monetary, quantitative (but non-monetary), or qualitative. Quantitative measures are thought to be desirable because they are perceived to be more objective than qualitative descriptions. Monetary estimates, if they can be reasonably made, are particularly useful in that they permit a direct comparison of different values using the same measure (*i.e.,* dollars). However, there are limitations to placing numerical significance on many types of values, particularly social, cultural and heritage values for which there are no meaningful quantitative measures readily available (Glicken 2003). In particular, the use of monetary estimates may assume the substitutability

of natural, social and economic values; whereas, it has been argued that some values are not substitutable and, in the case of ecological services, may not be replaceable at all (*e.g.,* Ekins *et al*. 2003). Qualitative evaluation should, therefore, be incorporated to provide context and a deeper understanding of the values of individuals and communities.

Once the current values of the study area are described, the next step is to examine how these values may be affected for the designation of the CWA in question. Changes in the management and regulatory regime associated with the designation of a new protected area may result in substantial changes to the benefits that are received from the land. The prohibition or exclusion of certain activities within a new protected area will result in the loss of the benefits associated with those uses. Restrictions in the level of other activities may also lead to a reduction in benefits, although, in the long-term, it is possible that these can be offset by increases within a broader regional context. The exclusion or restriction of some activities may also result in an increase in the benefits associated with other competing activities. For example, a reduction in the use of an area for forestry may ultimately lead to an increase in recreation benefits or ecosystem service benefits.

In short, there are socioeconomic trade-offs and interdependencies that must be considered in making decisions regarding the management of the land. However, the results of this study should not be reduced to a cost-benefit analysis that is, in turn, used as the basis for a designation decision. As outlined in Section 1.1, the purpose of WA designation is to help meet provincial environmental objectives that include maintaining ecological integrity and biodiversity, protecting representative examples of natural landscapes and ecosystems, and protecting natural features and phenomena, while also providing a protected land base for wilderness recreation, nature tourism and other low-impact uses. A CWA is initially identified based on the ability of the area to help achieve these objectives.

In this context, the role of the socioeconomic analysis is to provide information on the costs and benefits associated with designation so that there is a more complete level of knowledge regarding the impacts. Using this information, decision-makers can proceed with designation, with or without mitigation measures; or, if they believe that the socioeconomic costs are too high, they can decide not to designate an area. Compensatory interventions may also be considered, so that losses associated with reduced activities in a designated area may be replaced by increased activities elsewhere. If an area is designated, decisions must also be made regarding those activities that are restricted but may be permitted. The results of the socioeconomic analyses help identify those activities that have particular importance.

It is important to note that the socioeconomic analysis focuses on a description of the predicted change in values from the current *status quo* to after designation of the CWAs, and assumes that the areas are effectively managed in accordance with the *Wilderness Areas Protection Act* and other applicable legislation and policies. For some types of values it is clear how they will be affected by designation (*e.g.,* prohibited activities). But for others, it is not possible to reasonably predict quantitatively how the values will change, although the direction of change can be predicted. For values that are expected to be afforded greater protection with WA designation, these are best simply characterized as being at less of a risk of being adversely affected.

It is beyond the scope of the study to consider other legislative or policy means to achieve similar conservation objectives, or to evaluate the effectiveness of current land management on protecting values. For example, archaeological and cultural heritage may be separately protected under the

Special Places Protection Act and the *Nova Scotia Museum Act*. Crown lands in Nova Scotia are currently managed using an Integrated Resource Management (IRM) approach (Stewart and Neily 2008). However, IRM is a planning process designed to accommodate and promote multiple uses and values; it is not designed to legislate such uses.

1.4 Project Scope and Objectives

In order to satisfy the requirements of the Act, socioeconomic analyses of designating WAs within the Blue Mountain-Birch Cove Lakes, Ship Harbour Long Lake, and Shelburne River Crown parcels have been conducted. This study presents the results of those analyses. It considers a comprehensive range of social and economic benefits and costs that may be associated with designation, with the ultimate goal of providing the necessary information to support decisions regarding the designation and management of the land parcels in question. The study methodology is described in Appendix A. A number of interviews were conducted with stakeholders to collect specific information on the CWAs. Those contacted and asked to provide information are listed in Appendix B. The information collected through interviews was supplemented through a review of existing documents and available secondary data. Consistent with the Act, the study is being made available to the public as part of a public consultation program.

The evaluation and conclusions contained in the study are based on an interpretation of conditions revealed through investigation and research within a defined scope. The results are necessarily limited by the information that was available. However, this study does provide the necessary detail to serve as an important source of information for making informed decisions on the designation and management of WAs within the Blue Mountain-Birch Cove Lakes, Ship Harbour Long Lake, and Shelburne River Crown parcels.

A socioeconomic analysis is one avenue through which socioeconomic values can be considered. NSE is concurrently conducting a separate public consultation process for the three CWAs, which includes public notices, workshops and meetings, and is another mechanism for gathering public input regarding designation. This report will also be made available to the public for review and comment. Public feedback on the report will be gathered and managed by NSE.

2.0 IDENTIFYING THE VALUES

There are a number of frameworks that can be used to describe the values attributable to the environment or to protected areas. Most essentially contain the same or similar elements, but the values are categorized differently. For example, the Federal Provincial Parks Council developed a framework for estimating the benefits of parks and protected areas that includes personal benefits (the benefits accruing to stakeholders), commercial benefits as measured by economic impacts, and societal benefits (benefits through the "public good" characteristics of the site in question, including, for example, benefits from biodiversity, water production, and scientific and educational benefits) (The Outspan Group 2000).

More recently, the Millennium Ecosystem Assessment (2003), a four year international process to inform decision-makers on the links between ecosystem change and human well-being, defined the types of values provided by the natural environment as provisional, regulating, cultural and supporting services. Provisional services were defined to include, among others, food, fresh water, fuel wood and genetic resources. Regulating services include climate, disease, and water regulation. Cultural services include spiritual and religious values, recreation and ecotourism, aesthetic values, educational values, and cultural heritage. Supporting services include soil formation, nutrient recycling and primary production.

Environmental or ecological economists have tended towards the use of a somewhat different categorization (*e.g.,* Pearce and Turner 1990; Phillips 1998; Turner 1999; Pearce et al. 2002). A distinction is usually made between direct use values, indirect use values, and non-use values. Direct use values include those from direct use of the land, including recreation, tourism, natural resource harvesting, hunting and fishing, and education and research. These uses can be commercial or non-commercial. Non-commercial uses of the land are not captured by traditional measures of economic activity (such as Gross Domestic Product, or GDP). Indirect use values focus on the services provided indirectly to people by ecosystems, including such things as maintenance of water quality, creation of soil, and maintenance of biodiversity. Non-use values (also sometimes called passive use values) are of two types: existence values (the values that people have for knowing that the habitat and its associated species exist, although there is no actual or potential use) and bequest values (values that the current generation has for conserving the habitat and its species for the benefit of future generations). In practice, bequest values can be methodologically difficult to distinguish from existence values. Social, cultural and heritage values are types of non-use value.

These categories are useful to use in identifying and describing the various values. This is true whether or not monetary, quantitative (but non-monetary) or qualitative information is used in the socioeconomic analysis. Wilson and Colman (2001) employed a similar approach in an effort to fully account for the values associated with the forests of Nova Scotia.

Note that the above approaches are inherently anthropocentric. That is, there is no accounting for any possible intrinsic values of biodiversity. As this study is a socioeconomic analysis and not an assessment of the independent ecological values, any values unrelated to humans will not be considered. In other words, the analysis will identify only those values that contribute directly or indirectly to human welfare (Bockstael *et al.* 2000).

A categorization of the socioeconomic values is presented based on a review of the literature (*e.g.,* Loomis and Richardson 2000; Krieger 2001) and consideration of the specific characteristics of the three

CWAs (Table 2.1). Those most appropriate for use in an analysis of the impacts of WA designation in this context were selected. In particular, selection of the most appropriate categories considered:

- The types and characteristics of the personal and commercial uses of the study areas;
- The biophysical characteristics of the environment;
- The types of indirect use and non-use values that can be anticipated based on the characteristics of the environment and the relationship of the environment to humans and communities; and
- The technical characteristics of the available socioeconomic studies in the literature from which value estimates may be applied.

TABLE 2.1 Selected Value Categories

Value Category	Values
Commercial Values (direct use)	Forestry
	Mining
	Tourism
	Research and Education
Individual Values (direct use)	Vehicle and Bicycle Use
	Fishing
	Hunting and Trapping
	Wilderness Recreation
Societal Values (non-use)	Cultural and Heritage
	Existence
Ecosystem Service Values (indirect use)	Climate Change Mitigation
	Water Regulation
	Biodiversity Maintenance

Note: Vehicle uses include snowmobiles, ATVs, and other off-road vehicles. Wilderness recreation includes wildlife viewing, hiking, camping, cross-country skiing, canoeing and boating.

There are other categories of values that have been identified in the literature, but are not distinguished in the approach taken for this study. For example, the impact of greenspace on property values has been addressed in other studies. However, the research that has been conducted to date has been primarily concentrated within urban or residential development areas, and impacts have been shown to be specific to location, the type of land development in question, and market conditions. Given the state of knowledge, it is not possible to examine the property value issue, as adjacent property values can increase or decrease, depending on a number of factors. The positive value of health impacts associated with the use of parks and protected areas has also, to a limited extent, been addressed in the literature. As a direct use benefit, wilderness areas can support healthy life-styles and governments' strategic objectives regarding the health of the population. Again, limits to the state of knowledge and the amount of secondary information available for the three CWAs prevent a reasonable examination of these values within the scope of this study.

2.1 Commercial Values

Commercial values are values directly attributable to economic production or activities that use the natural resources in the study area. The commercial activities in the CWAs can include forestry, mining, tourism, and research and education.[1]

2.1.1 Forestry

Within the province of Nova Scotia, the forestry industry has traditionally been a major source of employment and revenue. Overall contribution of the forestry sector to the economy averaged about 2.4% of provincial GDP throughout the 1990s, or a total of about $450 million in 1998 (APEC 2003).

The industry has faced new challenges in recent years, with the out migration of skilled workers to the west, rural populations shrinking, an aging labour force, and profit margins narrowing significantly as a result of the rising Canadian dollar and energy costs (APEC 2007).

To statistically show the downfall in recent years, APEC and Scotiabank released a report card in 2007 which highlighted the following information (APEC and Scotiabank 2007):

1) The number of firms in the Atlantic forest industry dropped by 11% between 2004 and 2006.

2) As a result of permanent and temporary mill closures, output of the region's forest industry fell 9% in 2005.

3) Atlantic Canada's forest industry shed more than 8,000 jobs between 2004 and 2006. This 24% decline in employment was more than double the 11% drop nationally.

Nova Scotia is behind the rest of Canada in value-added per cubic metre of wood harvested. In 1998, NS ranked 5th in the country with a value-added of $127/m^3, but in 2004 ranked 9th with $107/m^3 (GPI Atlantic 2008).

All of these factors, combined with increased competitions for woodlands for other purposes (*e.g.,* other industrial development, residential development, recreation and environmental use), are challenges for this corner stone industry within Nova Scotia.

2.1.2 Mining

Various activities are included in the mining sector in Nova Scotia: mineral exploration, mine development, mineral production, secondary processing, provision of goods and services to the industry, and mine site rehabilitation. Including primary and processing activity, there is a total provincial employment associated with the sector (including direct and spin-off) of 6,340 jobs per year and a total contribution to the GDP of $488.6 million, of which 3,350 jobs and $270.3 million originated from primary extraction alone (NSDNR 2006). Direct provincial employment in the mineral industry totaled 1,600 full-time employees with an estimated total payroll of approximately $96 million, including

[1] Two power transmission lines within the Blue Mountain-Birch Cove Lakes CWA will be recognized as pre-existing legal interests under the Act. Operation of this infrastructure should not be affected by designation and, thus, will not be considered further in this report.

wages and benefits (NSDNR 2006). In 2006, approximately $11 million was spent by mineral exploration companies in the search for mineral deposits throughout Nova Scotia. Nova Scotia has been involved with the production of gold, coal, gypsum and anhydrite, salt, barite, limestone and dolomite, clay, silica sand, dimension stone, slate, peat moss, and aggregate resources. Also, lead and zinc are being mined at the Gays River, near Stewiake.

The Province of Nova Scotia saw direct revenue of $2.4 million from actions relating to exploration and mineral production. As of March 12, 2008[2], there were 59,565 claim blocks covering 907,228 ha or about 16.6% of the province (NSNDR 2006).

2.1.3 Tourism

Tourism is an important industry in Nova Scotia with an estimated $1.33 billion in business revenue generated from tourism-related activities in 2007 (NSTCH 2008), up from $1.1 billion in 1998 (NSTPC 2003). In 2007, Nova Scotia welcomed more than 2 million visitors and tourism made up 7% of Nova Scotia's workforce. There was a 22% increase in air travelers to the province since 2000 as well. The Nova Scotia Tourism Partnership Council strategically set outdoor adventure as one of Nova Scotia's core experiences in their 2008 tourism strategy (NSTPC 2008). The tourism products that customers desire while visiting Nova Scotia include scenic touring, outdoor and nature activities, Acadian experiences, golfing, cuisine and wine-production related activities; outdoor recreation includes kayaking, canoeing, biking, hiking, whale watching, birding and recreational walking (NSTPC 2003). WAs can provide a protected land base that is suitable for delivering many of the desired outdoor and nature tourism products.

In 2006, tourism generated $623.6 million in revenue for the Halifax/Dartmouth region, $111.9 million in revenue for the South Shore, and $13.5 million in revenue for the Eastern Shore (Table 2.2).

TABLE 2.2 Economic Impacts of Tourism by Region, 2006

	Halifax/Darmouth (Blue Mountain-Birch Cove Lakes area)	South Shore (Shelburne River area)	Eastern Shore (Ship Harbour Long Lake area)
Revenues (million $)			
Tourism Revenues	623.6	111.9	13.5
Employment			
Total Employment	15,700	2,800	300
Source: NSTCH http://www.gov.ns.ca/tch/pubs/insights/AbsPage.aspx?id=4&siteid=1&lang=1			

2.1.4 Research and Education

Natural environments can be particularly important as sites for research and education. Species and ecosystems have value as sources of information that cannot be obtained elsewhere. This information can be in the form of something as specific as the genetic make-up of unique populations of species, or

2 Note that the data contained within the report is from 2008, despite the report dating 2006.

the composition of unique natural chemicals. At a broader scale, research in natural areas is important to increase our knowledge of how ecosystems are structured and how they function. This becomes important knowledge in managing our interactions with the environment. Protected areas are particularly useful for such research because the extent of human impacts is limited. As such, these areas can serve as long-term reference sites for research activities. Use as field sites for education at all levels (primary school to post-secondary education) also contributes to building awareness among the general population regarding habitat management issues and natural heritage values.

NSE, through the Protected Areas Branch, actively encourages partnerships in support of ecological research in protected areas. Approximately 16 Maritime universities and research institutions have conducted research in the province's protected areas, with more than 20 research licenses issued annually in the past few years (NSE 2008d).

2.2 Individual Values

Individual values are those values that occur directly to individual users, and for which there is no direct commercial sale for the use itself. This includes outdoor recreation involving: the use of motorized vehicles (snowmobiles, ATVs, and other off-road vehicles); bicycles; fishing, hunting and trapping; and other outdoor recreational uses such as walking and hiking, canoeing, kayaking and cross-country skiing.

2.2.1 Vehicle and Bicycle Use

Vehicle use includes the use of snowmobiles, ATVs, and other off-road vehicles. It also includes the use of bicycles (*i.e.,* mountain and BMX bicycles). As previously discussed in this report, vehicle and bicycle use is generally prohibited in WAs, but may be permitted in limited circumstances, as outlined in the Act.

2.2.2 Fishing, Hunting and Trapping

Fishing, hunting and trapping are generally permitted within WAs. These activities would largely continue after designation. Changes in use patterns may occur with restrictions on the use of off-highway vehicles, which are often used to gain access into forests and lake systems.

In 2005, $7.5 billion was contributed to local Canadian economies by anglers. Of this, $5 billion was investments and purchasing durable goods required for fishing activities. Transportation, food, lodging, fishing services, and fishing supplies covers the remaining $2.5 billion (DFO 2005). There were a total of 50,807 anglers (local and non-resident) in Nova Scotia in 2005 with an average age of 50 for males and 49 for females (DFO 2005). Each angler spends an average of 21.5 days active each year and $1,556 on major purchases and investments relating to angling in Nova Scotia.

Hunting and trapping are popular activities in Nova Scotia. Table 2.3 details the furbearer harvest in the province between 2002 and 2007. Note that muskrat, squirrel and beaver are the three most harvested furbearing animals in Nova Scotia in the last five years.

TABLE 2.3 Furbearer Harvest in Nova Scotia 2002 – 2007

Species	2002/03	2003/04	2004/05	2005/06	2006/07
Beaver	4,166	5,281	4,973	5,251	5,651
Muskrat	15,274	19,340	17,980	18,559	25,761
Otter	591	696	619	551	446
Mink	1,811	2,049	1,708	2,175	2,146
Bobcat	1,193	1,205	750	742	900
Fox	677	805	595	660	735
Raccoon	3,019	3,551	4,916	2,996	3,575
Skunk	183	150	132	125	66
Squirrel	5,152	3,161	8,050	3,941	7,223
Weasel	1,179	1,477	1,001	1,691	1,400
Coyote	1,809	2,422	1,838	2,619	2,532
Fisher	138	138	117	138	221
Source: NSDNR http://www.gov.ns.ca/natr/wildlife/FURBERS/fharvest.htm#2002F					

Table 2.4 focuses on the harvests in 2006/07 from the two counties containing the three CWAs: Halifax and Queens Counties. Beaver, muskrat and raccoon were the top three harvested animals in both counties in 2006/07.

TABLE 2.4 Fur Harvest for Halifax and Queens County as Calculated from License Returns and Fur Buyer Slips in 2006/07

Species	Halifax	Queens
Beaver	573	221
Muskrat	642	120
Otter	74	21
Mink	253	82
Bobcat	122	52
Fox	38	5
Raccoon	320	91
Skunk	16	9
Squirrel	235	80
Weasel	183	16
Coyote	253	61
Lynx	0	0
Marten	0	0
Fisher	6	5
Source: NSDNR http://www.gov.ns.ca/natr/wildlife/FURBERS/fharvest.htm#fh2006		

2.2.3 Wilderness Recreation

Other outdoor recreation as defined for this study includes a number of activities such as hiking, camping, nature viewing, boating (*i.e.,* canoeing, kayaking), and other sporting activities (*i.e.,* cross-country skiing, snowshoeing, and geo-caching). These activities are consistent with and among those defined as "wilderness recreation" under the Act. One of the objectives of the Act is to protect and provide opportunities for such activities in a wilderness setting.

These outdoor recreation interests are represented by a number of groups that promote and organize outdoor activities. Many of the groups place an emphasis on low impact use, outdoor education, appreciation for the conservation of species and habitats, and awareness of natural history.

2.3 Societal Values

Societal values are those values that occur broadly to the benefit of all of society and are not attributed to an individual's use of the environment. This includes cultural and heritage values and existence values. Existence values are spiritual and psychological values, where people may hold values for particular natural areas simply because they exist, even though they may not visit or use the land in question. Within this latter category is also included the value that current generations have for conserving natural environments for future generations (bequest values).

2.3.1 Cultural and Heritage

Nova Scotia's heritage provides an understanding of the province's uniqueness and diversity, and provides a sense of identity and community. Nova Scotia Tourism, Culture and Heritage (NSTCH) recently released a heritage strategy for the Province (NSTCH 2008). This strategy acknowledges the importance of heritage to Nova Scotians and involves three major areas of government focus for the next five years to ensure that Nova Scotia's natural and cultural heritage is preserved and promoted now and for future generations. The three strategic directions for the government of Nova Scotia are:

- To better coordinate the efforts of those who share responsibility to preserve, protect, promote, and present Nova Scotia's heritage;
- To improve the development and sustainable management of the full range of the province's significant heritage; and
- To increase public recognition of the value and relevance of the province's rich heritage.

Cultural and heritage values are held intrinsically by citizens and contribute to the rich history of the Province. Through legislation, such as the *Special Places Protection Act* and the *Nova Scotia Museum Act*, the Province is protecting and enhancing archaeological and cultural heritage. These values are also afforded protection under the *Parks Act*, the *Minerals Act*, and the *Treasure Trove Act*. Sites of significance can also be protected under the *Wilderness Areas Protection Act* or in other protected areas. Arts and crafts, Gaelic initiatives, archaeology and fossil exploration and protection, and the natural sciences are examples of projects supported by the NSDTCH. Archaeological significance is used as the key indicator in examining the cultural and heritage values of the CWAs. A longstanding tradition of hunting, fishing and recreation activities in a wilderness setting are also cultural and heritage values that are of interest for protection within WAs.

2.3.2 Existence

There are a number of non-use benefits that can be provided by protected areas. These include:

- Strengthening cultural identity and heritage values in Nova Scotia by contributing to the survival of landscapes and ecosystems that people identify with, such as scenic coastlines, highlands, lakes and forests;
- Inspiring writers, poets, musicians and artists; and
- Inspiring a philosophy of life that recognizes certain ethical values relating to natural landscapes, and that encourages conservation and lifestyle choices that contribute to sustainable development and quality of life for Nova Scotians.

Bequest values are also included in this category. These are values that people hold because of their desire to conserve natural environments for future generations. In an extended capital accounting framework, these bequest values have real economic value, as depreciation of natural capital assets will occur at the expense of future generations. For example, the harvest of forest land today will be shown as present income on this analysis, but may result in a depreciation of the existence value associated with the remaining forest if further loss of species or ecosystem diversity occurs over time.

A survey commissioned by the Ecology Action Centre found that the majority of Nova Scotian's believe more publicly owned Crown land should be protected in Nova Scotia. The poll conducted by Corporate Research Associates included a representative sample of 400 adult residents from across the province, and had a 96% response rate (EAC 2004). The formal question sent out for response was the following:

> *"Some people say that protecting more wilderness areas in Nova Scotia is necessary to conserve native plants and animals for outdoor recreation. Others say there are already enough protected areas, and that to create more would be too costly, particularly for resource-based industries such as forestry and mining. All things considered, do you personally believe there should be more, the same amount, or fewer protected wilderness areas on publicly owned Crown land in Nova Scotia?"*

The results indicated that 69% believed that there should be more protected areas, 28% believe that the number of protected areas should remain the same, and 3% believe that there should be less protected areas. Survey results will be affected by the specific wording of the question that is posed (and it should be noted that the question led individuals to consider use values, rather than existence values *per se*). However, it is a strong indication of the relative value that individuals in Nova Scotia place on protected areas, as it can be expected that many of the respondents would never have visited a WA nor plan to do so in the foreseeable future.

2.4 Ecosystem Service Values

Ecosystem service values measure the importance of the indirect role of the environment to providing valued ecological services to humans. These include, in particular, climate change mitigation (*e.g.,* the carbon sequestration function performed by forests, thus offsetting greenhouse gas production), regulation of water (*i.e.,* management of water flows across landscapes to prevent extreme flow events that can cause flooding and soil erosion, and maintenance of water quality in streams and lakes), and biodiversity maintenance (*i.e.,* helping to ensure the diversity of plant and animal life that contributes to a well-functioning ecosystem and, in turn, supports many commercial and individual values).

It is important to note that the ecosystem service values described in this study are not complete. There are other ecosystem service functions which may also be important but for which we cannot describe because the available information is not sufficient. This report focuses on climate regulation, water regulation and biodiversity maintenance. In addition, these three key sets of values may serve as proxies for other ecosystem service functions not included here. For example, effective water regulation by forests will, in general, also mean that soil erosion is prevented.

There are a number of important services provided by ecosystems. Those that have been identified in the literature include: generating and maintaining soils, maintaining hydrological cycles, nutrient cycling and storage, assimilation and elimination of pollution and wastes, regulating disturbances, maintaining

species and genetic resources, maintaining biogeochemical cycling, and regulating weather and climate (*e.g.,* de Groot 1994; Folke *et al.* 1994; Bingham *et al.* 1995; Costanza *et al.* 1997; Myers 1996).

Forests, in particular, provide a number of important ecosystem services (*e.g.,* Loomis and Richardson 2000; Krieger 2001). These include the regulation of climate, sequestration of atmospheric carbon dioxide, the filtering of air for improved air quality (*i.e.,* uptake of NO_2, particulate matter, and volatile organic compounds), and the regulation of water flows. Natural, multi-species, multi-aged forests have been shown to improve water quality, reduce runoff and erosion (thereby preventing transport of sediment and chemicals to streams), and facilitate recharging of the ground water supply.

Wetlands are also prominent within the Nova Scotia landscape. There are a number of services provided by wetlands, including: water flow moderation; groundwater recharge; shoreline and erosion protection; climate regulation; water quality treatment; nutrient export; carbon sequestration and storage; and biological productivity and support for biodiversity (*e.g.,* Barbier *et al.* 1997; de Groot *et al.* 2006).

Even when reasonably good data exists for some ecosystem services, there have been no comprehensive estimates that take into account the full range of values provided by natural areas. Most studies have been limited to one or a few components only (*i.e.,* carbon sequestration) that can be readily monetized. Such numbers can also be heavily influenced by site-specific factors. Furthermore, it must be acknowledged that monetization is generally a poor tool with which to value non-market ecosystem services that may nevertheless have substantial, if not irreplaceable value. Only a limited number of ecosystem service values will be highlighted here – climate change mitigation, water regulation, and maintenance of biodiversity, and only one of these (carbon sequestration) will be monetized. Thus, the total value of ecosystem service benefits will be underestimated in this report.

2.4.1 Climate Change Mitigation

Forests represent an accumulation of biomass. As they grow, they sequester carbon dioxide, thus offsetting our contribution to climate change due to the destruction of forests (land clearing and burning of biomass), the burning of fossil fuels, and other anthropogenic sources. Newly planted or regenerating forests will act as a net sink for carbon for up to 50 years or more after establishment, depending on the species mix and site in question, until capacities for net carbon uptake become limited (Intergovernmental Panel on Climate Change 2000). At this stage in the development of a forest, the uptake of carbon by new biomass is more or less offset by the loss of carbon through death and decay.

The impacts of global climate change include an increase in average temperature, a change in precipitation patterns, an increase in the frequency of extreme events (*i.e.,* storms, drought), and a rise in sea levels. This will, in turn, result in a number of negative impacts, such as an increase in damages to structures from storms, a loss of land from sea level rise, changes in fish stocks due to changes in water temperature and chemistry, declines in certain agricultural products due to changes in weather and precipitation patterns, and increases in the costs of supplying water to people and communities.

There are a number of ways to approach the valuation of carbon sequestration. As one option, an economic value on the climate change mitigation function performed by forests may be accomplished by estimating the value of the damages avoided. However, it is challenging to estimate these values because of the various uncertainties and unknowns involved (*i.e.,* prediction of local or regional impacts

over time; estimation of economic value of the impacts themselves, including when they occur). As another option, one may look to industrial carbon credit markets as an indication of the dollar value that existing markets place on emissions, which, in turn, is ultimately linked to the price of least-cost alternatives for avoiding atmospheric carbon emissions. Both valuation methodologies will be assumed here as an indication of the range of values placed on the sequestration of carbon. The range of values varies substantially based on the valuation methodology employed.

Bein and Rintoul (1999) estimate the total global value of damages avoided by carbon sequestration to be $325/tC (Canadian dollars per metric tonne of carbon), which is also in agreement with the range of estimates summarized by the Intergovernmental Panel on Climate Change (2000, 2001). A reasonable estimate of the market value of carbon credits is $15/tC as the proposed Canadian Regulatory Framework for Industrial Greenhouse Gas Emissions comes into effect in 2010 will be set at this price (Government of Canada, 2008). Some offsets are traded at a much higher cost ($34/tC with myclimate, a Swiss offset company), while the average seems to be between $3-4/tC (EcoBusinessLinks.com, 2008). The variability of the cost of carbon offsetting is a result of investing in a voluntary verses regulatory market, and whether the offset has been verified (*e.g.,* VCS, CCAR, VER, Gold Standard verifications).

Studies indicate that the conversion from old-growth to young forests produces a net loss of carbon to the atmosphere, even when the carbon uptake of new forests is taken into account (*e.g.,* Kurz *et al.* 1998; Schilze *et al.* 2000). Older forests contain a greater amount of biomass than young or second growth forests (*e.g.,* Harmon *et al.* 1990). Accounting for the long-term storage of carbon in wood products from harvesting, and considering the total carbon storage in plant biomass and soils typical of the forest types found in Nova Scotia, the difference in the long-term storage of carbon between managed (harvested) and unmanaged, natural forest is estimated to be 15 to 30tC/ha (Kurz *et al.* 1998; Kulshreshtha *et al.* 2000).[3]

2.4.2 Water Regulation

The water regulation functions provided by forests include filtering and intercepting water, controlling run-off, and removing air pollutants (GPI Atlantic 2000), along with significant erosion and sediment control functions. This, in turn protects water quality in streams and lakes. Riparian habitats are particularly important to prevent turbidity and sedimentation in streams, and to moderate temperatures to maintain suitable habitats for fish.

Wetlands, in particular, provide a wide range of valuable functions, including: “waste and nutrient cycling; protection against erosion, floods and storms; water purification; food production; and are one of the richest known wildlife habitats and an essential link in the food chain” (Wilson 2000). Wetlands also purify water, detoxify waste, regulate our climate, and mitigate climate change (Millennium Ecosystem Assessment 2005).

There is also growing evidence that protected areas can help maintain water supplies for municipalities, and that there are long-term cost savings associated with the protection of watersheds (World Bank and World Wildlife Fund 2003). For example, in 1997, the City of New York acknowledged the cost

3 Note that these figures are generalized for the geographical region and forest type. More specific figures for the CWAs are not readily available; however, the range provided is believed to be a reasonable assumption for the analysis.

savings of investing in watershed protection versus building a new water filtration plant. A new plant would have cost $6 to $8 billion to build and $300 to $500 million to operate annually. As an alternative to building the new plant, a watershed protection plan was implemented, with a projected cost of $1 to $1.5 billion over 10 years (Parlange 1999; Daily and Ellison 2004). The Water Framework Directive of the European Union is another example of a framework at the regional level (Millennium Ecosystem Assessment, 2005). Thus, with protection of the watershed, water quality objectives were able to be met at a substantial cost saving. According to Myers (1997), the price of water from a forested watershed catchment (with undisturbed forest) increases twofold after a forest is logged, and fourfold after uncontrolled logging.

2.4.3 Biodiversity Maintenance

Forests are complex functioning ecosystems. They provide a wide range of forest functions, including: "protection of soils, watersheds, biodiversity, habitat for species, aesthetic quality and recreational opportunities, climate regulation and sequestration of carbon from the atmosphere, and the provision of the high quality, wide diameter, clear timber that characterizes older forests" (GPI Atlantic 2008). Taken as a whole, it is important to maintain biodiversity itself to ensure the continuation of this complex set of functions and relationships. Through existing legislation, species known and assessed as at risk are provided protection under the federal *Species at Risk Act* and the provincial *Endangered Species Act*.

Biodiversity is the variety of life and all its processes, and includes the range of living organisms within an ecosystem, their genetic differences, and the communities in which they naturally occur (GPI Atlantic 2008). A genetically diverse ecosystem will have greater resilience and a greater ability to adapt to environmental change. Maintaining a diverse assemblage of species is critical for the long-term survival of forests and other ecosystems.

The concern for the loss of older age forests and biodiversity has recently been validated: forest area between 61 and 80 years-old occupied 34.3% of Nova Scotia in 1958 while it occupied 11.9% in the 1999-2003 inventory (GPI Atlantic 2008). Forests older than 101 years occupied 8.7% in 1958, and a mere 0.3% in the 1999-2003 inventory (GPI Atlantic 2008). The 1999-2003 inventory cited the current make-up of NS forests to be: 23.9% <20 years old; 12.8% 21-40 years; 32.3% 41-60 years; 11.9% 61-80 years; 1.2% 81-100 years; and 0.3% >101 years. While old growth forests are on the decline, the percentage of younger forests has increased (GPI Atlantic 2008).

Several species are dependent on older forests for their survival, using large snags, cavities and fallen logs as habitat. Studies have also found that forest fragmentation and edge effects caused by clear cutting and roads can have severe impacts on species that: require large territories and/or large, uninterrupted tracts of forests; are susceptible to predation and parasitism by "edge-loving" species; are sensitive to human contact; or do not traverse large openings (Schonewald-Cox and Buechner 1992).

Species and groups of species identified as sensitive to clear cutting and associated with mature forests include certain lichens, plants and arthropods; flying squirrels, moose, marten, fisher, lynx, trout, wood turtles (classified as vulnerable), yellow-spotted and red-backed salamanders, spring peepers, wood frogs, hawks, barred owls, thrushes, warblers, and woodpeckers. To date, very few studies have examined the effects of forest fragmentation and harvesting of mature forests on wildlife in Nova Scotia,

but it is likely that protected area status can maintain, enhance, and protect the habitat of key species of flora and fauna.

Wetlands also play a significant role in sustaining biological diversity. There are several factors contributing to the importance of wetlands compared to that of other ecosystems (Millenium Ecosystem Assessment 2003; Mitsch and Gosselink, 2000):

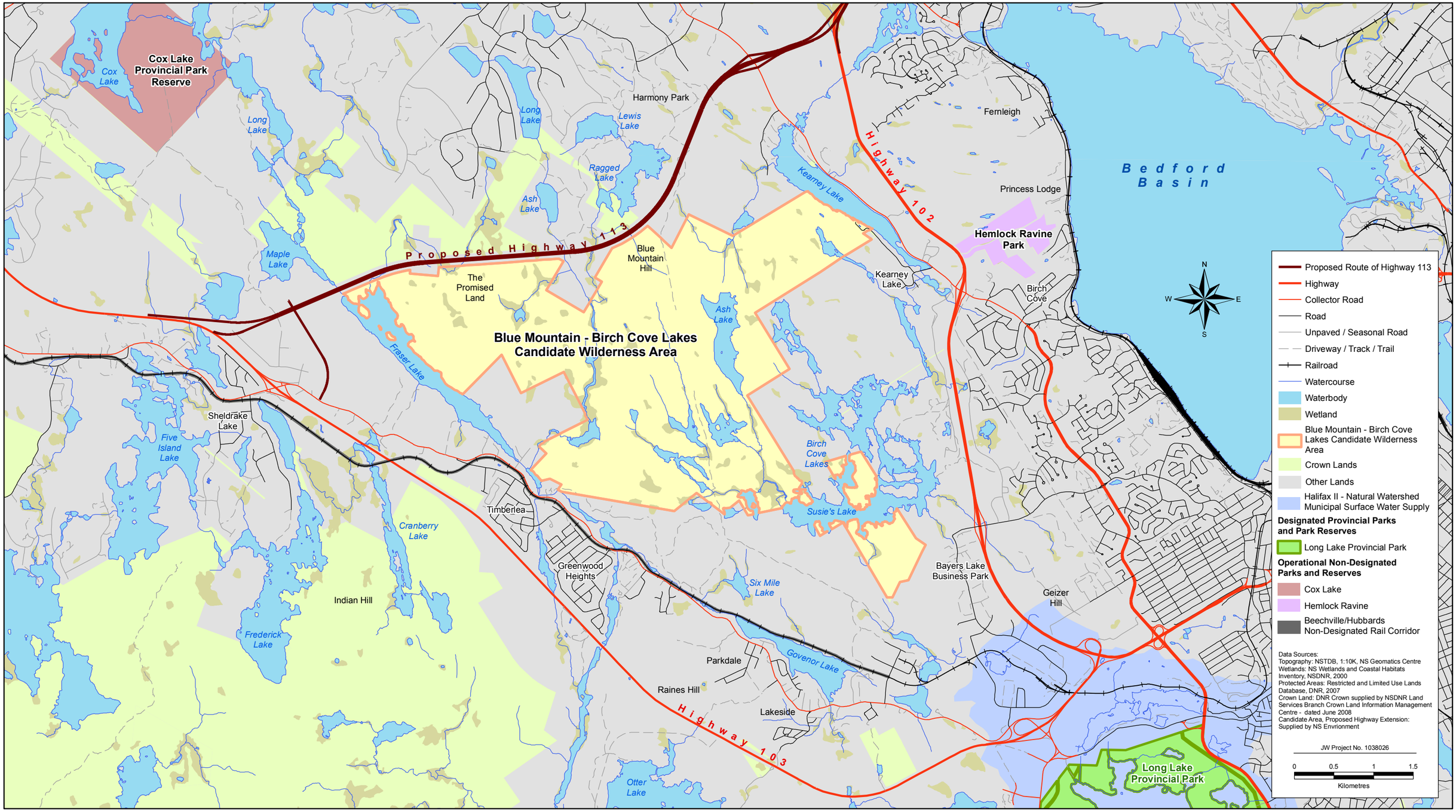
- wetlands represent a transition between terrestrial and aquatic habitats, supporting both aquatic and terrestrial species;
- some wetland types have exceptionally high productivity, supporting a large and complex food chain;
- some wetlands support a unique set of conditions requiring specialized adaptation for survival (*e.g.,* anoxic, acidic, low nutrient soils);
- wetlands themselves are diverse, and grouping the species that can be found in any wetland class represents a large range of species; and
- wetlands are refuges for wildlife in a landscape, compared to forests, meadows, and aquatic systems that are more adaptable to human use.

3.0 BLUE MOUNTAIN-BIRCH COVE LAKES CANDIDATE WILDERNESS AREA

3.1 General Description

3.1.1 Geographic Location

The Blue Mountain-Birch Cove Lakes CWA is located on the western edge of the Halifax urban core (Figure 3.1). This land parcel is located less than 10 km from the city centre, between Highways 102 and 103, and south of the proposed Highway 113 corridor. It is approximately 1,350 ha in size, including lakes and rivers. This new wilderness area will contribute to the regional park which Halifax Regional Municipality (HRM) intends to establish in this general area, as committed within HRM's Regional Plan. The area's close proximity to the urban core is one of the unique features influencing the values assessment.



DATE: 03/12/2008

PREPARED BY: L.Kendell

NOVA SCOTIA Environment

Blue Mountain - Birch Cove Lakes Candidate Wilderness Area

FIGURE NO.: **Figure 3-1**

Jacques Whitford

3.1.2 Biophysical Description

The area is part of the Atlantic Coastal Climatic Region with cool summers, warm winters, high rainfall and frequent heavy fog. It is comprised of three main habitat types: forests (85%), lakes (8%), and wetlands (7%). The geology of the CWA is predominantly granites of the Devonian South Mountain Batholith, which intruded Neoproterozoic to Early Ordovician rocks of the Meguma Supergroup approximately 380 million years ago (NSDNR 2008e). The surficial geology is comprised of hummocky ground moraine, exposed bedrock and stony till.

The Blue Mountain-Birch Cove Lakes CWA is the largest area without roads near the Halifax urban concentration and contains a diverse mosaic of ecosystem types, including numerous forest types, wetlands, barrens, aquatic areas, still-waters, streams and bedrock ridges and cliffs. Forest types include several stands of old red oak, red spruce and white pine.

3.1.3 Encumbrances and Holdings

The candidate area is Provincial Crown land and is currently under the administration and control of Nova Scotia Department of Natural Resources (NSDNR). A moratorium on new land commitments applies until designation. The area is classified by NSDNR as Category II land (Multiple and Adaptive Resource Use) and is recognized for recreation and trail development values or land of outstanding scenery and viewscapes (EDM 2006).

Halifax Regional Municipality's Regional Planning Strategy (2006) designates about 25% of the CWA as Mixed Resource, with the remaining 75% designated as Regional Park (Figure 3.2). Mixed Resource land can be used for residential, resource, agricultural, industrial or community use (HRM 2006). Regional Park land can be used for recreation, conservation, and associated uses (HRM 2007a). The CWA, if designated, would contribute to and functionally be a part of the regional municipal park conceptualized in the HRM Regional Plan.

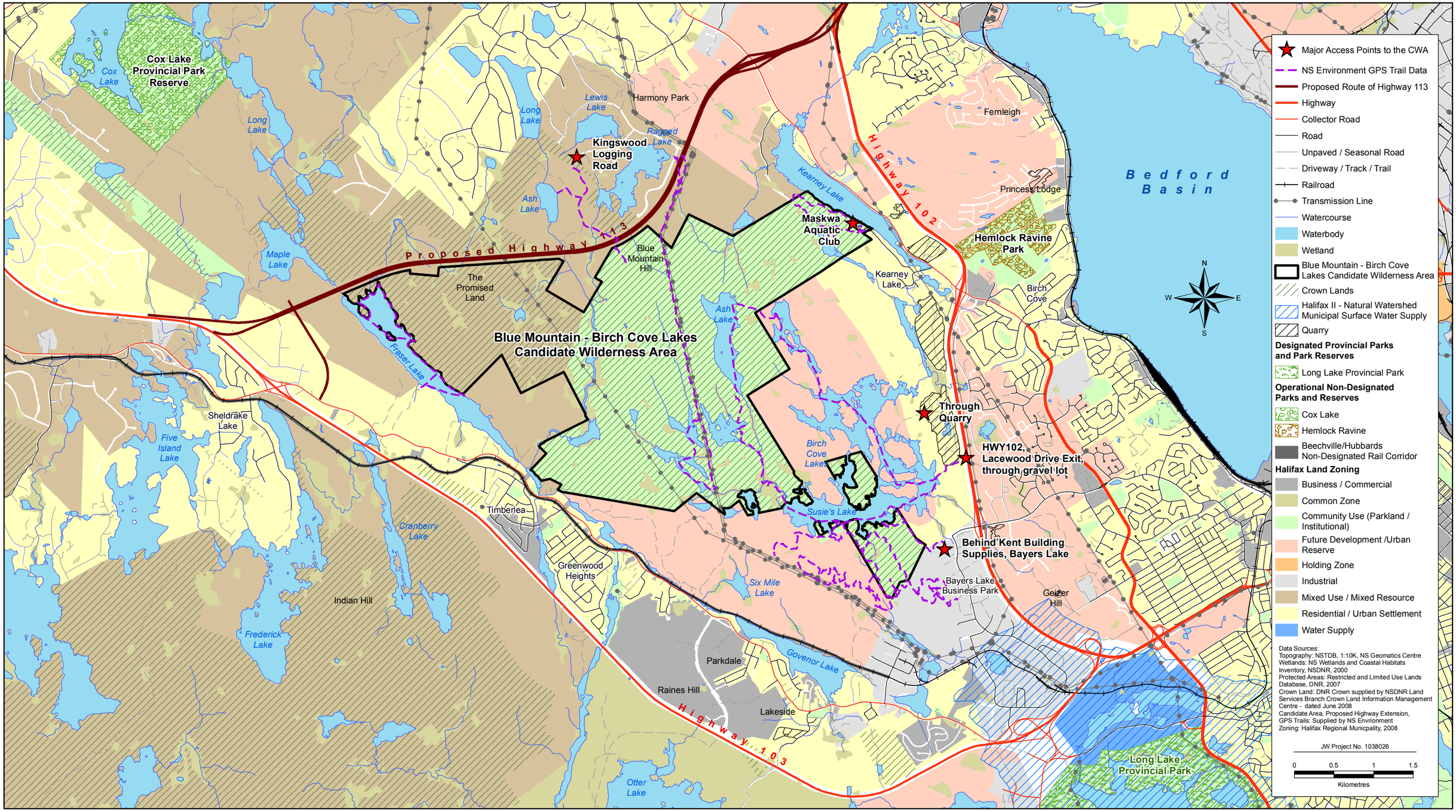
Within the Blue Mountain-Birch Cove Lakes (BMBC) area, there are two right-of-ways owned and maintained by Nova Scotia Power for electrical transmission lines (Figure 3.2). These two right-of-ways are within the CWA but will be recognized as pre-existing legal interests under Section 25 of the *Wilderness Areas Protection Act*. Nova Scotia Power will continue to have access to their infrastructure within this right-of way.

The Maskwa Aquatic Club is a paddling and swimming club situated within the CWA (Figure 3.2). The club has a lease for the use of approximately 41 acres of land between Kearney Lake and Charlie's Lake, which is a major access point into the CWA. The Maskwa Aquatic Club recently renewed its Crown land lease for 20 years.

Public access is a potential issue for this area, as most of the current access points are through lands that are privately owned. There are five main access points to the CWA, shown in Figure 3.2 (B. MacDonald, Pers. Comm., 2008):

- Kent Building Supplies on Chain Lake Drive (trail behind Kent leads to Susie's Lake);
- Kingswood logging road (trail heads up Blue Mountain);

- The Maskwa Aquatic Club parking area at the end of Saskatoon Drive (on provincial land with trail that leads to Charlie's Lake);
- Highway 102, north of the Lacewood Drive exit (gravel lot with trail leading to Susie's Lake); and
- The quarry, when it is not operating (trail leads to Quarry Lake).



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NOVA SCOTIA Environment

Blue Mountain - Birch Cove Lakes Candidate Wilderness Area Land Uses

FIGURE NO.: **Figure 3-2**

Jacques Whitford

3.2 Current Values

3.2.1 Commercial Values

3.2.1.1 Commercial Recreation Use

The non-profit Maskwa Aquatic Club provides facilities for paddling and swimming for its members, and is located on the shores of Kearney Lake within the Blue Mountain-Birch Cove Lakes CWA (J. Moore, Pers. Comm., 2008). It has also developed hiking trails within woodlands of the CWA. The club operates on money from provincial and federal grants, as well as a user pays system from the approximately 700 members who live primarily in Clayton Park, Rockingham, Wedgewood, Kingswood, and Bedford (within 10 to 50 km from the CWA) and promotes healthy living with emphasis on aquatic recreation. The club has one full-time employee (the head paddling coach), as well as approximately 13 seasonal staff from June through August, which combine to require a budget of approximately $100,000 a year for staffing.

This club is within the CWA, and as such, depends on the CWA for direct income and supports the designation, as it would benefit the club and protect the area (J. Moore, Pers. Comm., 2008). The lake system and natural woodlands environment are considered important features of the area. The club is concerned about certain uses of the area's trails, such as mountain bike use, as well as residential development on adjacent private lands and quarrying. The Maskwa Aquatic Club would like to be a steward and play a role in conserving the area.

Members of the club and the general public use the area for geo-caching, canoeing, kayaking, swimming, hiking, and some cross-country skiing. There is also an off-leash area for pets. Currently, facilities include a clubhouse with a canteen and gym, as well as a boathouse with 55 boats. In the busiest months (July and August) an estimated 175 paddlers and 125 swimmers use the club each week. Even in the off-season, the club accommodates approximately 20 members, three times a week. The groundwork (septic and well installed) has been completed for the club to build a new facility on site, with construction planned to begin in September, 2008. Further expansion would ideally include growing the trail network in partnership with other organizations (J. Moore, Pers. Comm., 2008).

3.2.1.2 Forestry

The Blue Mountain-Birch Cove Lakes CWA is 1,345 ha in size, which includes 873 ha of potential working forest and 93,000 m^3 of working forest growing stock (D. Eidt, Pers. Comm., 2008). The total present stumpage value of the area has been identified by NSDNR as approximately $1,465,000 (NSDNR 2008d). There would be an estimated wood supply loss of approximately 1,700 m^3/year with the designation of the CWA. It should be noted that these volume and stumpage values are maximum estimates. Actual available harvests would depend on the results of regional IRM planning. The current composition of the CWA from a covertype perspective is detailed in Table 3.1.

TABLE 3.1 Land Base Classification Area Summary: Blue Mountain-Birch Cove Lakes

Land Base Classification Area Summary (%)	
Harvestable softwood	35
Harvestable mixed wood	18
Harvestable hardwood	12
Operational restrictions (20m buffers, steep slopes, etc.)	6
Non-forested	24
Inland water (lakes, double line rivers, etc.)	5

3.2.1.3 Mining

Bedrock and surficial geological mapping, geophysical surveys (*e.g.,* airborne gamma-ray spectrometric or 'radiometric'), and geochemical surveys (*e.g.,* lake sediment and glacial till) have been conducted in the CWA (NSDNR 2008e). The results of these surveys assist in predicting the potential for mineral deposits. The main potential types of metallic mineral occurrences in the CWA include polymetallic tin, tungsten, molybdenum, copper, or zinc in granitic rocks of the South Mountain Batholith. However, there are no known metallic mineral occurrences within the CWA. The area's bedrock has potential use as dimension stone and aggregate. Dimension stone deposits of biotite granodiorite rocks, and crushed stone aggregate do occur within or near the CWA (NSDNR 2008e).

Historically, the entire CWA has been under mineral exploration license for both metallic minerals and uranium. Currently, there are no companies or individuals with minerals rights in or immediately adjacent to the CWA (NSDNR 2008e). Granitic rocks (*i.e.,* biotite granodiorite) were previously quarried in the Quarry Lake area, just outside the CWA, for use as building stone in Halifax. Blue Mountain itself could potentially provide high quality crushed-stone granite aggregate, although NSDNR believes there are sufficient similar deposits of fine-grained leucomonzogranite rocks elsewhere in the HRM for development of aggregate quarries (M. MacDonald, Pers. Comm., 2008). NSDNR's Mineral Resources Branch appears to be satisfied with the proposed CWA boundaries, despite the potential for metallic mineral occurrences or the development of dimension stone or aggregate quarries (NSDNR 2008e).

The Mining Association of Nova Scotia (MANS) is generally concerned with the potential loss of economic opportunity from the mining sector with the designation of new protected areas. Further, they advocate for permission to explore all CWAs for uranium deposits if the moratorium for uranium exploration is lifted in Nova Scotia.

While there is a potential loss of economic opportunity if the CWA is closed off to mining exploration and development, there are currently no exploration licenses or developed or planned mines in or adjacent to the Blue Mountain-Birch Cove Lakes CWA.

3.2.1.4 Tourism

Given this area's close proximity to the urban centre of Halifax, it is a destination for naturalists, conservationists, and tourists who visit the area. However, there is no specific documentation of tourism use within the CWA. In a recent letter to NSE, the Tourism Industry Association of Nova Scotia (TIANS) stated that "the high concentration of tourism activity and the population in the Halifax region makes the CWA a natural resource to be enjoyed by visitor and residents alike. Having an accessible wilderness area in Halifax will create significant eco-tourism opportunities" (July 31, 2008 letter from

TIANS). Predicted effects on tourism values with designation are positive, as protection is expected to lead to expanded outdoor recreation opportunities and related infrastructure.

3.2.1.5 Research and Education

Educational initiatives help to increase community awareness and cultivate a societal value of understanding and nurturing of natural systems. The lakes, waterways and woodlands of the Blue Mountain-Birch Cove Lakes CWA are located close to a number of universities and schools. The Nova Scotia chapter of Canadian Parks and Wilderness Society (CPAWS) believes the CWA is important for providing wilderness education to nearly half of Nova Scotia's population, due to its close proximity to Halifax (C. Miller, Pers. Comm., 2008). Groups and individuals are known to use the CWA for research and educational purposes.

For example, Halifax Northwest Trails Association runs guided nature walks within the area, and members of Trout Nova Scotia conduct regular research to keep up-to-date on the health and quality of the trout population in lakes within the CWA. Public consultation submissions from a number of teachers and Big Brothers Big Sisters of Greater Halifax support designation of this CWA, citing education opportunities of the area. Most recently, St. Mary's University has decided to hold a bioblitz within the CWA, scheduled for June 2009, with an anticipated budget of $65,000. This event will consist of a 24-hour inventory of all living organisms in a given area, drawing on the expertise of numerous specialists and the interested public (O. Maass, Pers. Comm., 2008).

Designation of the CWA will protect natural areas for future research and educational purposes. It is not known with reasonable certainty whether research and education values will increase, but all current values can be expected to at least be maintained.

3.2.1.6 Adjacent Private Land Development

A number of developers have land holdings adjacent to the CWA, including Armcocap, Annapolis Group, Sisters of Charity, and Gateway Materials, which have collectively formed Birchdale Projects Inc. Together, these developers own approximately 500 hectares (1,200 acres) east of the CWA, including 51,000 linear feet of shoreline and 60 acres of islands (C. Lowe, Pers. Comm., 2008). The partners in Birchdale Projects Inc. are seeking regulatory approval to develop their land for commercial and residential purposes, and are interested in including formal access to the CWA. This group of developers perceives there to be no impact to them by the designation of the Blue Mountain-Birch Cove WA (C. Lowe, Pers. Comm., 2008).

3.2.2 Individual Values

3.2.2.1 Vehicle and Bicycle Use

There is currently a small amount of ATV use along parts of the transmission line corridors (see Figure 3.2), though passage is limited in both cases by large watercourses (still-waters); mountain bike use occurs on the "Whopper Dropper" trail network south of Susie's Lake and near the Bayer's Lake Business Park. This trail network partially overlaps with the CWA. Some mountain bike use also occurs within the CWA on hiking trails within and just outside the 41 acre lease area held by Maskwa Aquatic Club (J. Moore, Pers. Comm., 2008).

Based on the available information, none of the ATV or mountain bike trails were developed or are used with permission of the landowners, including within the CWA. The Halifax Northwest Trail Association believes the CWA is currently being negatively impacted by ATV use in the northern end of the canoe loop route (B. MacDonald, Pers. Comm., 2008). According to the ATV Association of Nova Scotia (ATVANS), no club affiliate of ATVANS is believed to be associated with the existing, limited ATV use in the CWA. ATVANS has a membership of approximately 2,500 and growing, with participants and ATV clubs from across the province (C. Robar, Pers. Comm., 2008). According to the association, individual members tend to use their ATVs within 10 to 100 km of where they live for personal enjoyment, hunting, angling, fishing, and picnicking. Members are typically outdoor-oriented as trips are typically 4 to 8 hours long, and approximately 75% of users use their ATV to access another form of activity. The membership utilizes existing routes, and ATVANS recognizes that off trail use is discouraged but hard to regulate.

ATVANS members are not dependent on the area for recreation and ATVANS is in favour of resource protection recognizing the important features for them are the existing trails and maintenance of habitat for hunting and fishing. No negative impacts are deemed by ATVANS to be associated with the designation if current, proposed boundaries are maintained. ATVANS works to manage ATV use through self-policing, education of riders, enforcement, and peer education (C. Robar, Pers. Comm., 2008).

Bicycle use may be authorized in wilderness areas on designated trails or routes, so designation of the CWA may or may not lead to loss of riding opportunities. New opportunities for bicycle use could potentially be authorized. As development proceeds on adjacent private lands, both mountain bike and ATV trails on these private lands will likely be lost, except as may be accommodated on any lands acquired by HRM for regional park purposes.

3.2.2.2 Fishing, Hunting and Trapping

Aquatic areas within and adjacent to the CWA appear to be used regularly by anglers. Several small lakes within the CWA contain landlocked populations of speckled trout, minnows, suckers, and perch (T. Owen, Pers. Comm., 2008). Many actions, such as high recreational usage, littering, and increased fishing pressure are currently believed to be impacting the area and quality of the trout fishing opportunities; invasive species are not believed to have reached this area yet, but there is a risk because they are currently found in nearby waters (*i.e.,* Paper Mill Brook, Kearney Lake).

Trout Nova Scotia is a conservation organization comprised of trout anglers who want to protect and enhance wild trout in Nova Scotia by working with government towards making policy changes, among other methods (G. Taylor, Pers. Comm., 2008). Its 260 members are located all over the province, but are concentrated mainly in the HRM. Their interest is in the conservation and protection of trout and their habitats as the trout population in the CWA is currently low but believed to be healthy, and their use of the CWA is primarily for recreation and research seasonally (April-September). Though usage estimates are difficult, Trout Nova Scotia reports that the waterways, trails, access routes, and parking areas within and adjacent to the CWA are all utilized at a rate of approximately three times a season (for about 5 hours a time) by approximately 20 of its members. An unknown but likely large number of anglers who are not members of Trout Nova Scotia also use the CWA.

Trout Nova Scotia believes that provincially there has been a 60-70% drop in the Nova Scotia trout population in the last 25 years (information from communication with a regional biologist).

Development, forestry, overfishing, highways, roads, commercial development, subdivisions, quarries, mining, climate change, acid rain, and introduced species likely all play a role. The organization believes the waterways of the CWA and associated lands need to be protected from impacts by development and forestry. They believe the natural environment, water quality, biodiversity, waterways and proximity to Halifax are some of the important features of the CWA. Conservation is of primary importance to Trout Nova Scotia, and it believes it can play a role in management in terms of education of trout anglers on conservation issues.

Fishing activities will be allowed to continue within the WA; therefore, there are predicted to be no substantial effects on existing uses and values. With designation of the CWA there may be positive effects in the long-term due to the enhanced protection of the waterways and, thus, potentially of the fish populations. Opportunities for additional angling use may be enhanced.

No known hunting or trapping occurs within this CWA. Given the accessibility of the area and its proximity to residential areas, it is likely that at least some trapping does occur (*e.g.,* rabbit snaring). However, because hunting and trapping are generally permitted within CWA, designation is not expected to impact these values (not considering any existing municipal restrictions on hunting and trapping).

3.2.2.3 Wilderness Recreation

Canoeing, kayaking, swimming, hiking, nature appreciation, and camping are all popular activities within the Blue Mountain-Birch Cove Lakes CWA. Known canoeing and hiking routes, as well as main access points, are shown in Figure 3.2. During the winter months, cross-country skiing and skating are known to occur. Many individuals, as well as groups, use the area. Canoe Kayak Nova Scotia (CKNS) and the Halifax Northwest Trail Association are two of the groups that benefit from use of the CWA.

CKNS is a non-profit society of approximately 250 members, and is focused on promoting safe, recreational canoeing and kayaking in Nova Scotia (D. Soudek, Pers. Comm., 2008). Although membership is province-wide, the majority of members live in HRM. They use the Blue Mountain-Birch Cove Lakes area all year long for a variety of activities, including canoeing, kayaking, hiking, portaging, angling, photography, and nature study. The portages are well-used by this group, particularly because the canoe loop in the CWA is very popular for one and two day trips. CKNS has suggested the existing canoe routes could also be linked to the Nine Mile River system, and to Bedford Basin via Kearney and other lakes.

The organization is in full support of designating this area and feels the important features include proximity to the city, beautiful variety of landscapes, good camping opportunities, complex shoreline, and many coves. Currently, new mountain bike trails, highway pollution, litter problems, and the close proximity to residential and commercial areas are all negatively impacting the area. If the area became unavailable, current users would have to travel farther. CKNS believes the designation of this area will increase use; however, the group is willing to maintain portages along with other users (D. Soudek, Pers. Comm., 2008).

The Halifax Northwest Trails Association is a non-profit society with a mandate of planning, construction and promotion of trails for the purposes of nature appreciation, education, leisure and recreation, and the promotion of an active healthy lifestyle (B. MacDonald, Pers. Comm., 2008). There are 40 to 50 members on the group's mailing list, who all live in close proximity to the CWA. The association participates in trail clearing, remediation, and guided walks. Official guided walks occur

once per season in spring, summer, and fall, with approximately 10 to 40 participants. Members' individual use varies, but hikes are generally 2 to 5 hours each time.

The Halifax Northwest Trails Association believes the old growth forests, ridges, canoe loop, proximity to the city, and available public transit are important features of the CWA. They believe the area is currently being negatively impacted by ATV use in the northern end of the canoe route. Ideally, the group would like to see the CWA and adjacent lands consolidated into a protected area with trail improvements, safer access routes, and a developed trail system through the area (B. MacDonald, Pers. Comm., 2008).

Designation of the CWA will positively impact outdoor recreational values. Designation will help conserve the existing wilderness, and the above-mentioned recreational activities will be allowed to continue. There may be restrictions on camping sites and trail creation, although there is the potential for the further authorized development of these. Overall, designation will help ensure that the lands within the CWA will not be developed and a range of wilderness recreation opportunities protected.

3.2.3 Societal Values

3.2.3.1 Culture and Heritage

The CWA has historically been used for berry picking, hiking, canoeing, and swimming by residents of the surrounding communities. Use of this area forms a key component of local heritage. Similarly, sport fishing in the many lakes within the CWA over time demonstrates a traditional use pattern (NSE 2008c). Existence values for the CWA also contribute to cultural and heritage values. Existence values are discussed in Section 3.2.3.2.

Evidence of pre-contact or historical use of the CWA by Mi'kmaq is scarce. No thorough archeological surveys have been performed in the area and no physical evidence of pre-contact or historical use has been found. However, it is well known that Mi'kmaq have a long history with the nearby Halifax Harbour and Bedford Basin areas. In a report by EDM (2006), a study area that includes the CWA was examined for proximity to watercourses, the slope of the land, and proximity to previously identified sites, with particular attention on the confluence of waterways, as these are key characteristics of Mi'kmaq use sites. In mapping these characteristics a number of sites were identified in the CWA with strong potential for archeological or historical values. Designation of the CWA will protect these values where they exist (S. Powell, Pers. Comm., 2008b).

There is also direct evidence of cultural heritage values within the CWA. There is evidence of a number of old logging camps within the CWA, and remains of a stone dam used in early timber harvesting activities can still be found. Quarrying activities in surrounding areas occurred in historical and more recent times. Although these heritage values represent uses that do not relate directly to WA protection, they form a part of the environmental history of the area (NSE 2008c).

Cultural and heritage values would be protected with designation of the CWA.

3.2.3.2 Existence Values

The local cultural heritage is partly defined by its proximity to an undeveloped natural landscape (NSE 2008c). People place value on just knowing that there is a natural wilderness area in their

neighbourhood, near Halifax's urban core. All of the above-mentioned organizations and associations that use the CWA are concerned with the preservation and conservation of the area for its intrinsic value, and would like it to be used and enjoyed by future generations. Specifically, Trout Nova Scotia is concerned with preserving the trout fishery in the area for the benefit of future generations (G. Taylor, Pers. Comm., 2008).

The existence values associated with the Blue Mountain-Birch Cove Lakes CWA are generally as described in Section 2.3.2. The available information does not permit further quantification or description of these values. However, designation of the CWA will help ensure the protection and conservation of the existence values into the future.

3.2.4 Ecosystem Service Values

3.2.4.1 Climate Change Mitigation

The Blue Mountain-Birch Cove Lakes CWA is approximately 1350 ha in size, which includes 873 ha of potential working forest. Using the damage cost avoidance estimate for the global value of carbon sequestration, protection has a present value of approximately $4.3 to $8.5 million over the managed forest option.[4] Using the carbon credit market value estimate, protection has a present value of approximately $0.2 to $0.4 million over the managed forest option (see Section 2.4.1 for details).[5]

Designation of this CWA is predicted to increase climate change mitigation values. The protection of forests helps ensure continued and increased carbon sequestration in the area.

3.2.4.2 Water Regulation

The CWA is not currently being used to supply community water. Wetlands and lake systems make up approximately 15 percent of the area of the CWA. The CWA contains portions of the headwaters of both the Nine Mile River and Kearney Lake-Paper Mill Lake watersheds, as well as diverse aquatic systems with 22 distinct lakes. The forested areas and wetlands help to control erosion, maintain water quality, and regulate water flows. This contributes to the protection of water quality and water supply in downstream lakes and waterways within the Kearney Lake and Nine Mile River systems.

With the designation of the CWA, water regulation values are predicted to be conserved and maintained. Protection of the watershed will allow it to continue to function as needed, providing necessary water, drainage, and wildlife habitats in the area.

3.2.4.3 Biodiversity Maintenance

The Blue Mountain-Birch Cove Lakes CWA is the largest area without roads near the Halifax urban concentration and contains a diverse mosaic of ecosystem types. Designation will help protect habitats and species that depend on interior forests, riparian corridors, wetlands, and granite barrens (NSE 2008b).

[4] Calculated as damage avoidance value of ($325/tC)(15-30tC/ha)(873ha).

[5] Calculated as carbon market value of ($15/tC)(15-30tC/ha)(873ha).

The CWA contains portions of two of Nova Scotia's Natural Landscapes:

- South Mountain Rolling Plain (includes two ecosystem types not found in existing protected areas: imperfectly-drained mixed shrub-land ridges and poorly-drained softwood forest hummocks); and
- Central Quartzite Hills and Plains (Shubenacadie Lake).

Seven significant ecosite types were identified in the CWA (NSE 2008b). These include coastal[6] barren, coastal open fen, coastal shrub bog, coastal shrub fen, coastal treed bog, coastal treed fen, and Lake Island.

Forest types include stands of white pine-dominated and red spruce/yellow birch-dominated stands. There is limited information available on wetlands, though they are present within the area. Rare species include the common nighthawk and Uhler's sundragon (dragonfly), as well as the artic-alpine plant, mountain sandwort (*Arenaria groenlandica*, also known as *Minuartia groenlandica*) (NSE 2008b). A remnant population of mainland moose (Alces alces Americana) is known to occupy parts of the Chebucto Peninsula, particularly south of the CWA. Moose sightings have been reported near the CWA boundary within the past five years (AMEC 2004; NSE 2008b). Speckled trout and salmon have reportedly been found in Nine Mile River (L. Benjamin, Pers. Comm., 2008).

With the designation of the CWA, biodiversity values are predicted to be conserved and maintained. Designation helps ensure the continued protection for all flora and fauna within the CWA.

3.3 Estimated Changes with Designation

Table 3.2 presents a summary of the potential changes to current values with designation of the Blue Mountain-Birch Cove Lakes CWA.

TABLE 3.2 Summary of Socioeconomic Values: Blue Mountain-Birch Cove Lakes

Value	Current Situation	With Designation	Without Designation
Forestry	▪ 65% of the area is harvestable.	▪ Maintain or increase forest diversity and age. ▪ Estimated wood supply loss of ~1,700 m^3/ year. ▪ Loss of stumpage value of approximately $1.5 million.	▪ Area remains available for forest harvesting. ▪ Stumpage value may be realized.
Mining	▪ No current mineral exploration projects.	▪ Loss of future exploration and potential mineral development (metallic and industrial mineral).	▪ High quality granite aggregate extraction potential. ▪ Potential for future exploration.
Tourism	▪ No known current tourism use. ▪ Close proximity to urban core allows tourist access.	▪ Potential for tourism use as area is managed for related values and with increased awareness and promotion of the area.	▪ Opportunity cost is a loss of potential tourism values.
Research and Education	▪ Used by groups for	▪ Maintain or increase	▪ Less opportunity for

6 Note that coastal refers to ecosites that occur within a zone of coastal influence, they are not necessarily located directly on the coast.

TABLE 3.2 Summary of Socioeconomic Values: Blue Mountain-Birch Cove Lakes

Value	Current Situation	With Designation	Without Designation
	research and educational purposes.	opportunities for research and education.	research and education as forests would be harvested and land may be used for other purposes.
Vehicle and Bicycle Use	▪ Very limited ATV use in the area (including known illegal watercourse crossing). ▪ Some unauthorized creation of mountain bike trails and associated use.	▪ No ATV use; ▪ Mountain bike use could be authorized. ▪ Enforcement would likely improve due to the responsibilities of government and stakeholders in the monitoring and enforcement of WAs.	▪ Current limited ATV and mountain bike use will likely continue.
Fishing, Hunting and Trapping	▪ Trout fishing, and possibly some hunting and trapping.	▪ Help protect trout population and maintain near-urban angling usage. ▪ Maintain hunting and trapping opportunities.	▪ Risk of decline of trout population due to forest harvesting and other potential land uses, and associated loss of angling values.
Wilderness Recreation	▪ Existing, informal wilderness recreation use.	▪ Area managed for outdoor wilderness recreation, which secures and enhances near-urban opportunities over the long-term.	▪ Likely decline in use over time as competing resource use and development occurs.
Cultural Heritage	▪ Place of special value for residents. ▪ History of fishing and canoeing, logging, quarrying and damming. ▪ Potentially contains historic Mi'kmaq sites.	▪ Historic sites will be protected. ▪ Protects wilderness recreation heritage. ▪ Supports development of outdoor recreation culture associated with near-urban wilderness recreation. ▪ More assured protection for sites of cultural and archaeological value	▪ Risk that the cultural heritage of this area will decline as development occurs. ▪ Potential damage to sensitive archaeological and historic sites.
Existence	• Roadless area of forests, wetlands and lakes. • Habitat for flora and fauna, including rare and endangered species.	▪ Conservation of existing ecosystems, flora and fauna.	▪ Expected loss of biodiversity as competing resource use and development occurs.
Climate Change Mitigation	▪ Existing carbon sequestering by forest.	▪ Present value over the managed forest option of ~ $4.3 to $8.5 million using the damage cost avoidance estimate. ▪ Present value over the managed forest option of ~ $0.2 to $0.4 million using the carbon credit market value estimate.	▪ Less carbon sequestration by forest.
Water Regulation	▪ Lakes and wetlands comprise 15% of the CWA.	▪ Help secure erosion control, protect water quality, and regulate downstream water	▪ Less water regulation in the area as forests are harvested or the area is

TABLE 3.2 Summary of Socioeconomic Values: Blue Mountain-Birch Cove Lakes

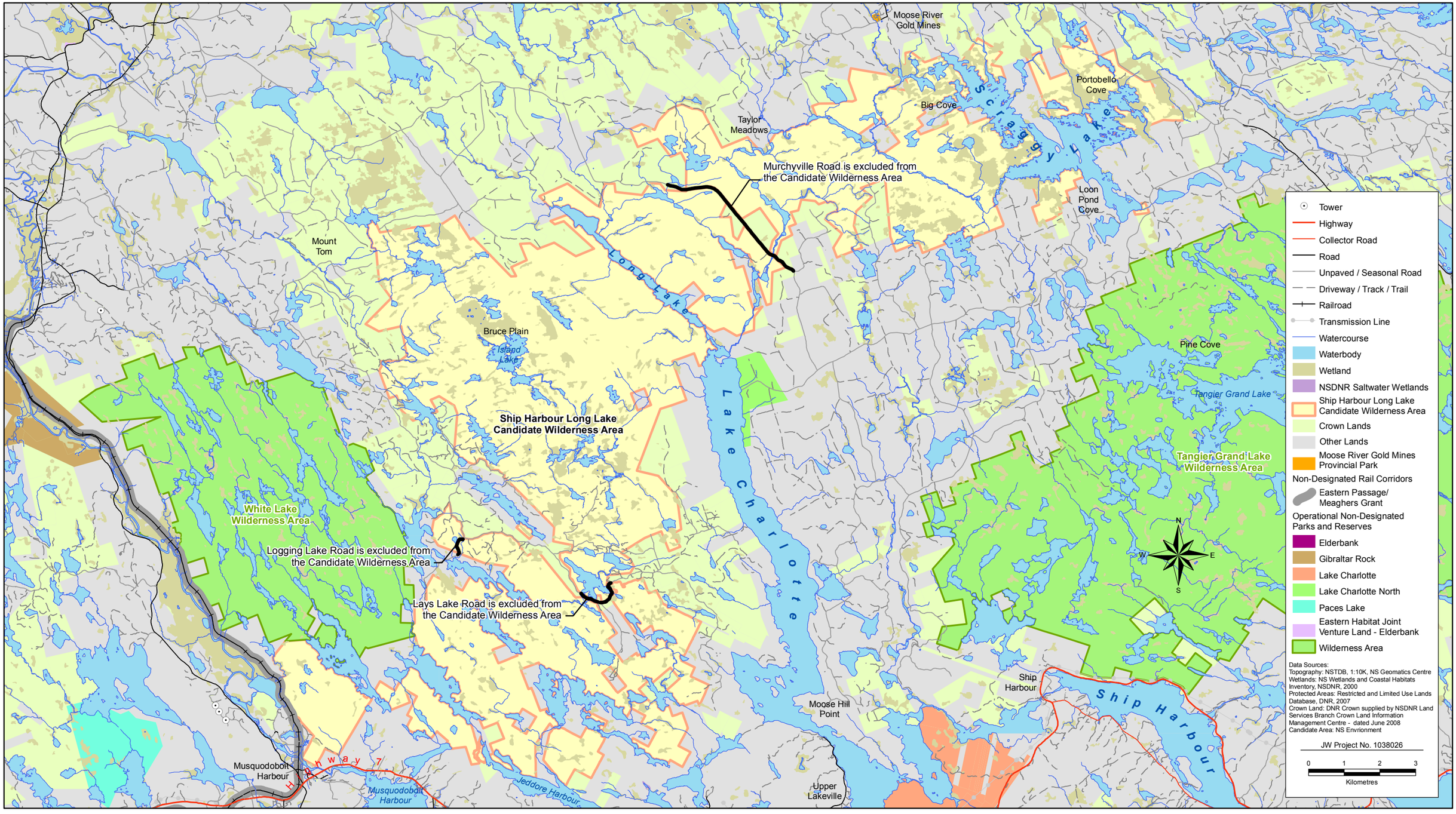
Value	Current Situation	With Designation	Without Designation
		flows by maintaining existing forests and plant life in the area.	otherwise developed. ▪ Increased risk of poor water quality due to increased sediment from erosion.
Biodiversity Maintenance	▪ Largest area without roads near Halifax's urban core ▪ Includes two ecosystem types not currently protected and seven significant ecosite types. ▪ White pine and red spruce/yellow birch dominated stands. ▪ Rare species include common nighthawk, mountain sandwort, and mainland moose.	▪ Maintain and potentially increase biodiversity in the CWA. ▪ Help protect endangered and rare species.	▪ Existing biodoiversity threatened as competing resource use and development occurs. ▪ Local conservation of rare and endangered species threatened.

4.0 SHIP HARBOUR LONG LAKE CANDIDATE WILDERNESS AREA

4.1 General Description

4.1.1 Geographic Location

The 14,187 ha Ship Harbour Long Lake CWA is located on the Eastern Shore, approximately 50 km northeast of Halifax. The CWA extends between the Head of Jeddore (to the south) and the shores of Scraggy Lake (to the northeast) (Figure 4.1). The area forms a wilderness corridor between White Lake and Tangier Grand Lake WAs. It connects inland waterways to the ocean via the Salmon River and Fish River-Lake Charlotte watersheds and includes numerous streams, rivers, and lakes throughout. The proposed area is the largest remaining unprotected wilderness in the HRM according to NSE, and combined with White Lake and Tangier Grand Lake WAs, will form about 35,000 ha of protected forests and waterways.



DATE: 03/12/2008

PREPARED BY: L.Kendell

NOVA SCOTIA Environment

Ship Harbour Long Lake Candidate Wilderness Area

FIGURE NO.: **Figure 4-1**

Jacques Whitford

4.1.2 Biophysical Description

The Ship Harbour Long Lake CWA includes 11,900 ha of forest. There is a further 1,148 ha of wetland, 50 lakes and hundreds of kilometres of streams and rivers. The area also provides habitat for rare lichens, the endangered mainland moose, and many other species. The area includes large tracts of roadless lands, and is bisected by several major forest access roads that will be excluded as corridors.

The Ship Harbour Long Lake area is underlain by Neoproterozoic to Early Ordovician rocks of the Meguma Supergroup, with granite rock intrusions of the Devonian Musquodoboit Batholith (NSDNR 2008c). The Meguma Supergroup is comprised of the Goldenville and Halifax formations, though the CWA includes almost exclusively the Goldenville Group.

Preliminary GIS-based inventory shows that old forest stands are scattered throughout the area of interest, many of which are red spruce-dominated, but white pine and mixed hardwood and softwood stands also occur. Approximately 70 percent of the CWA is within one of Nova Scotia's natural landscapes that is inadequately represented in a protected area (Central Quartzite Hills and Plains – Fish River).

4.1.3 Encumbrances and Holdings

There are a number of legal land use commitments that apply to the lands within the Ship Harbour Long Lake CWA, including campsite leases, mineral licenses, and a forest management license with Northern Pulp Nova Scotia Co. (formerly Neenah Paper) that applies to 8,081 ha of land. Section 4.2.1.1 provides a description of the forest management license held by Northern Pulp.

Fifteen campsite leases exist within the CWA (see Figure 4.2), and are listed in Table 4.1.

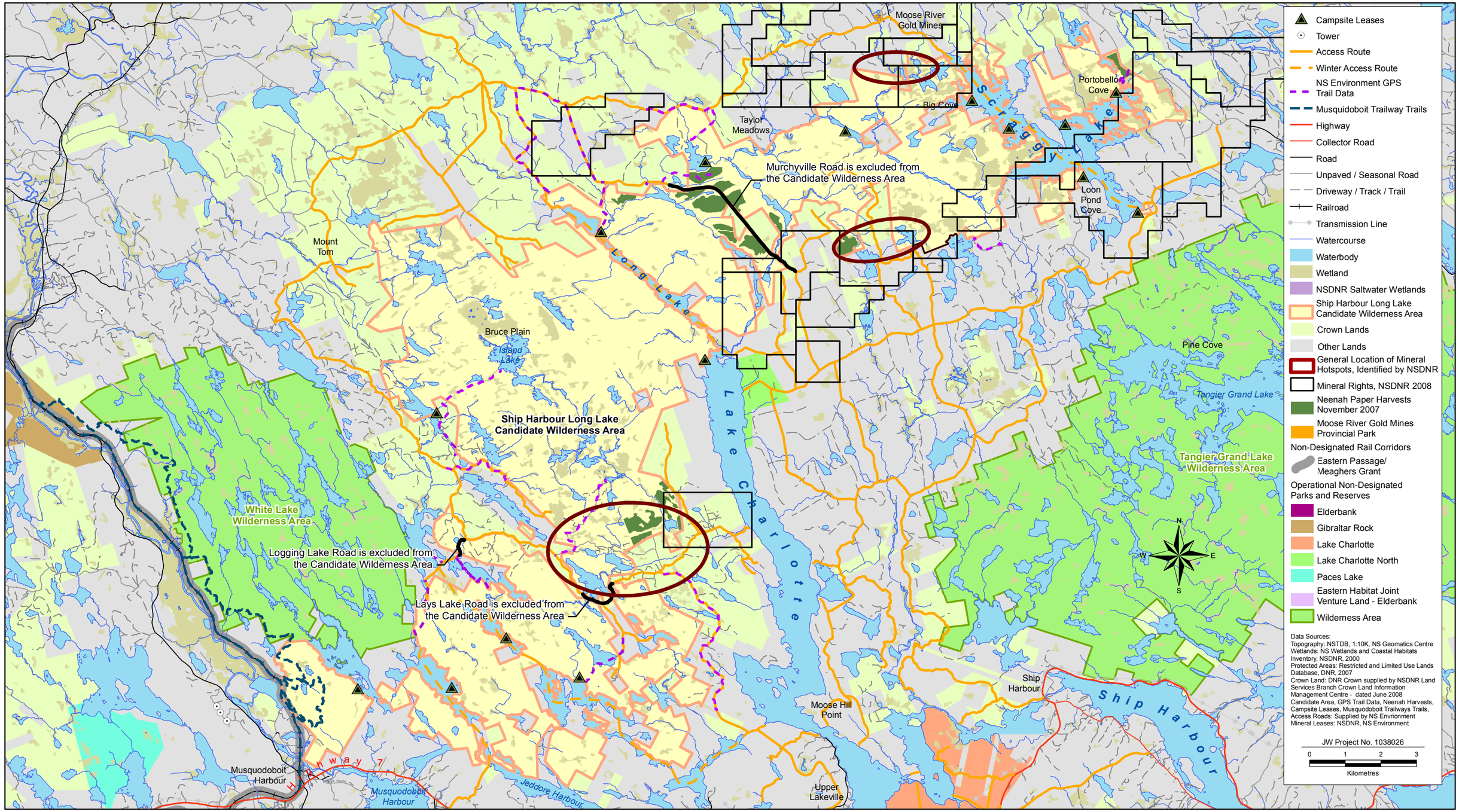
TABLE 4.1 Campsite Leases within Ship Harbour Long Lake Candidate Wilderness Area

Location	Campsite Lease #
Admiral Lake	4296
Salmon River Lake	3535
Moose Cove Lake	4460
Portapique Lake	4650
Richardson Lake	4655
Ship Harbour Long Lake	4679
Lake Charlotte	4693
Ash Hill Lake	3275
Fish River	3383
Scraggy Lake	3429
Scraggy Lake	4432
Scraggy Lake	3995
Scraggy Lake	4076
Scraggy Lake	4152
Scraggy Lake	4321
*prepared by Ron Williams of NSE, February 22, 2008, updated July, 2008.	

Current mineral exploration licenses within the CWA (see Figure 4.2) are held by the following individuals and companies:

- Acadian Mining Corporation.
- Alpha Uranium Resources Inc.
- Blackfly Exploration and Mining.
- D.D.V. Gold Ltd.
- Elk Exploration Ltd.
- Ellsin Resources Inc.
- Hilchey, Anthony F.
- MacDonald, Robert H.
- MacKinnon, R. Perry
- Thomson, Alex C.

Access routes and trails are also shown in Figure 4.2. The Musquodoboit Trailways Association maintains a hiking trail network in the southwest portion of the CWA.



DATE: 03/12/2008

PREPARED BY: L.Kendell

NOVA SCOTIA Environment

Ship Harbour Long Lake Candidate Wilderness Area Land Uses

FIGURE NO.: **Figure 4-2**

Jacques Whitford

4.2 Current Values

4.2.1 Commercial Values

4.2.1.1 Forestry

Northern Pulp Nova Scotia Co. is the primary forestry stakeholder within the Ship Harbour Long Lake CWA as the company holds approximately 8,081 ha of Crown land forest management lease within the CWA. The remaining Crown lands within the CWA are not licensed to specific operators, although these lands would potentially be available for harvesting should the CWA not be designated.

With approximately 350 regular employees and 430 contractors and indirect employees, Northern Pulp produces bleach craft pulp and sells to manufacturers who use it to make paper products (J. Kyte and S. Rutledge, Pers. Comm., 2008). Sixty percent of the customer base is in the United States, with the remaining business going almost entirely to the European Union. Northern Pulp sells wood to sawmills to make lumber, then buys back the bark (used for generating electricity) and wood chips (used to make craft pulp).

The forests in the CWA have contributed directly to the livelihood of Northern Pulp's business, as well as those sawmills that first receive the sawlogs harvested from the licensed lands. Northern Pulp's mill requires about 1 million tonnes of wood each year, which it obtains from harvests on the lands it owns and leases, and through purchases from other suppliers. In total, Northern Pulp harvests from approximately 84,000 ha of Crown land and approximately 201,000 ha of private land, and maintains a harvest of 100,000 tonnes/year on the leased Crown land (land in the CWA represents approximately 10% of this Crown land base).

In November, 2007, Neenah Paper (now Northern Pulp), EAC, CPAWS, Eastern Shore Forest Watch, NSDNR and NSE signed an agreement that supports establishing the WA (Government of Nova Scotia 2007). The Province of Nova Scotia is to compensate Northern Pulp for the loss of licensed forestry land in the CWA with access to Crown lands elsewhere to ensure that current wood supply volumes can be maintained. The impact on Northern Pulp is theoretically marginal provided they receive the needed wood compensation; however, they will need additional lands of mature wood for harvest over the next five years and new land may evoke extra costs not required on the previous lands allocated within the CWA (e.g., transportation costs if lands are further from the mill). In addition, the Northern Pulp License states that 25% of all stumpage revenue for harvests within the CWA is to be shared with the HRM; there may be a reduction or disruption in the stumpage revenue to the municipality, depending on where compensatory lands are found and on the provisions of the new Northern Pulp license.

There are other forestry interests operating on private lands outside of the Ship Harbour Long Lake CWA. One such landowner owns 16 properties in the area, including five inholdings (approximately 190 ha) and 11 adjacent or nearby (approximately 517 ha). The owner has interests in several small forestry companies and is concerned about the longevity of forestry operations if lands become isolated by a new WA. Under the Wilderness Areas Protection Act, the Minister of Environment must provide access to private inholdings, subject to possible conditions. NSE has also stated that while it may have some interest in a number of the landowner's properties, it is currently premature to consider specific

options at this time (O. Maass, Pers. Comm., 2008). The forest condition of the private lands varies from mature older forest to sites partially harvested in the 1970s and 80s.

The same owner has expressed concern that designating the CWA may reduce opportunities for establishing partnerships in the maintenance of the present Lays Lake Road. This forest access road, which is to be excluded from the CWA, was built and maintained by the shared interests of Scott Paper, Eddy Company, NSDNR, Hefler Forest Products and Musquodoboit Lumber. It is more than 25 km long, crossing many streams, bridges and culverts. It provides the only access to some of the properties in the area.

The total area of the Ship Harbour Long Lake CWA is 14,187 ha, which contains 9,640 ha of potential working forest area and 974,000 m^3 of working forest growing stock (D. Eidt, Pers. Comm., 2008). The stumpage value of the area has been identified by NSDNR as approximately $18.3 million. There will be an estimated wood supply loss of approximately 19,000 m^3/year if the area is protected. It should be noted that these volume and stumpage values are maximum estimates. Actual available harvests would depend on the results of regional IRM planning. The current composition of the CWA from a covertype perspective is detailed in Table 4.2, below.

TABLE 4.2 Land Base Classification Area Summary: Ship Harbour Long Lake

Land Base Classification Area Summary (%)	
Harvestable softwood	58
Harvestable mixed wood	8
Harvestable hardwood	2
Operational restrictions (20m buffers, steep slopes, etc.)	13
Non-forested	13
Inland water (lakes, double line rivers, etc.)	6

Northern Pulp is to be provided compensation through access to other Crown lands to replace the loss in wood supply. The details of this (*e.g.,* the location of the compensatory Crown lands) are not yet known and will be subject to agreement between the Province of Nova Scotia and Northern Pulp. With adequate compensation, there is predicted to be no substantial net costs to Northern Pulp.

However, other forestry operators are concerned with the longevity of their operations if lands become isolated with designation. This potential effect can not be accurately quantified, though the Province intends to work towards solutions by maintaining access to inholdings or adjacent lands, or through strategic land trades or land acquisition.

4.2.1.2 Mining

To evaluate the mining values of the Ship Harbour Long Lake CWA, information from individual stakeholders was considered, along with a discussion with the Mining Association of Nova Scotia (MANS) and a NSDNR research report (NSDNR 2008c). Mineral resources in the CWA include gold, tungsten-molybdenum-copper-zinc, aggregate, and peat deposits (NSDNR 2008c).

The most significant potential resource development in and adjacent to the CWA is the potential for additional gold mining. The Lake Charlotte and Gold Lake gold districts have similar geological features and gold occurrences to the Moose River Gold District. Recent mineral exploration by D.D.V. Gold in the Moose River Gold District has identified a large, low-grade deposit of over 600,000 ounces of gold, known as the Touquoy deposit (NSDNR 2008c). This proposed gold mine is located north of Scraggy Lake, just outside the CWA. Gold Lake and Lake Charlotte are considered to have excellent potential for developing gold deposits of similar size or larger. At a current price of approximately $750-1,000 per ounce, the Touquoy Gold Mine could produce a gross value of about $450-600 million in gold. NSDNR estimates that the other two gold deposits could collectively contain over $1 billion worth of gold (NSDNR 2008c). Based on this, NSDNR's Mineral Resources Branch would like consideration of boundary modification to ensure reasonable access to the Gold Lake and Lake Charlotte gold districts. The CWA is also noted to have moderate tungsten and tin potential, as well as peat and aggregate (NSDNR 2008c); however, the potential value of these resources may not warrant special consideration.

An exploration license (claim) provides the right to explore for one year, but a certain amount of work is required each year to maintain the license, and the amount of work increases with each year. The province collects money from claims fees and files any reported completed work on the areas. There is also an option agreement arrangement where one person may do the work on another person's claim. Each investor pays the initial fees, along with the money required to complete the assessment work and any exploration which may take place.

Areas for which exploration licenses have historically been held repeatedly and for longer periods of time can be used as an indicator of higher potential for mining relative to other areas. Based on repeated and sustained exploration interests, three main "hot spots" of activity have been identified in and adjacent to the CWA: 1) near the Touquoy Gold Project; 2) around Gold Lake; and 3) at Lake Charlotte West (see Figure 4.2).

MANS has requested that boundary adjustments be made to exclude these lands from the CWA, and want access to these areas to be negotiated with regulators prior to a final decision on WA boundaries (P. Oram and M. Landreville, Pers. Comm., 2008). MANS would also prefer that a full mineral evaluation of the CWA be undertaken through the consultative process, as they feel it is important despite being labour intensive and costly. This analysis would help to ensure all economic factors are taken into account before designating the area as protected. In particular, MANS would like the areas where there are long held claims to be explored further, as these areas may be in later phases of exploration and may be situated in areas where mines operated historically. MANS also believes claim holders should be properly compensated for their losses (fees, assessment work, expenditures, *etc.*) should the area be designated, or they should be allowed to continue exploration within the CWA. Further, MANS advocates for the exploration of uranium in the CWA if the moratorium for uranium exploration is lifted in Nova Scotia. According to MANS, local communities are benefiting or will benefit from: planning and development of the Touquoy gold project; the provision of a local supply of road materials; and investment in the local economy from each field excursion (P. Oram and M. Landreville, Pers. Comm., 2008).

A number of claim holders have made independent submissions to NSE. Elk Exploration Ltd. stated that some of the areas east and south of Scraggy Lake and north of Dreadnought Lake, through Gold

Lake to Lake Charlotte, have gold anomalies and occurrences. Gold Lake is a known gold occurrence with very limited production (L. Allen, Pers. Comm., 2008). The company would like proper consideration given to the mineral wealth of the province and a proper assessment of the lands. These lands essentially correspond to the Gold Lake and Lake Charlotte "hot spots" noted above (Figure 4.2).

One claim holder, who has been in partnership with exploration licenses in the Gold Lake area for 15 years, wondered what compensation will be offered to license holders for the money spent to date and for lost opportunities; the individual also questioned how the boundaries were determined and would like to know what rationale was used (G. MacKay, Pers. Comm., 2008). Another claim holder in the same area, who has held licenses for over 20 years, similarly questions the rationale behind the boundary decisions; the individual also wonders if there will be further buffer zones restricting adjacent land development, who will manage the WA, and if a citizen/stakeholder liaison committee will be formed to help with management. The following are quotes from the submission (R. MacDonald, Pers. Comm., 2008):

> *"There must be compensation offered to disenfranchised or disadvantaged holders of mineral licences and other titles. Persons and companies like me have spent thousands of dollars exploring for minerals under the permission and guidance of the provincial government and will now not be permitted to develop these provincial resources due to this WA designation...*
>
> *The permanent sterilization of natural resource exploration and development for such a large portion of the Province must be undertaken with careful consideration for what is best for all sectors of the Provincial economy. The strict environmental regulations in place in the province today for all mineral resource developments ensures that the mineral wealth of the province can be realized without any long term affects. Once these resources have been explored, developed, recovered and reclaimed, then the area can become the wilderness areas for all to enjoy for years to come."*

Existing mineral exploration licenses are considered a pre-existing interest, which are honoured under the *Wilderness Areas Protection Act*. The Minister of Environment may authorize potential mine development within these licensed areas, provided the activity does not degrade the WA. It is recognised that these potential restrictions may potentially limit mining investment.

It is not possible to estimate the economic value to the Province of Nova Scotia of a mine development until an economic deposit has been identified and a specific plan to develop a mine has been implemented. Exploration is active in limited portions of Ship Harbour Long Lake CWA. Maintaining mineral rights and exploration activities by themselves requires expenditures and generates income.

4.2.1.3 Tourism

The Ship Harbour Long Lake CWA currently supports modest tourism use. Much of this is associated with a trail system managed by Musquodoboit Trailways Association, which extends into the southwestern portion of the CWA and adjacent White Lake Wilderness Area, off the rail trail. No estimate is available for the value of related tourism use. At least one commercial hunting guide, Goldeneye Guide Service, also operates within the CWA.

The CWA offers a substantial land base to potentially support a variety of nature-based tourism products. This includes, for example, the potential for additional hiking trail development within the southwestern portion of the CWA and adjacent White Lake Wilderness Area (Figure 4.2), or elsewhere;

and the additional development and promotion of wilderness canoeing in conjunction with opportunities in adjacent Tangier Grand Lake Wilderness Area and White Lake Wilderness Area.

One tourism-related outfitter who may be negatively affected by designation of the CWA is Goldeneye Guide Service. The company has clients from across Canada and the United States who come to hunt bears, birds, and deer or take bear photography on guided tours (M. Mason, Pers. Comm., 2008). Bears are hunted or photographed at bait sites. In 2008, 4 of 15 of the company's bait sites are within the CWA. Goldeneye Guide Service has been running for over 20 years and is family owned. Bear is the primary animal harvested by clients from the CWA.

Although hunting within the CWA will be allowed to continue, the use of bear baiting is seen as inconsistent with the objectives of the *Wilderness Areas Protection Act.* The company's bear baiting sites are selected based on their proximity to bear travel routes and are registered with NSDNR. To attract bears, sites are baited daily and this is typically done for the first several seasons on new sites before they are used by clients. ATVs are used to remove a harvested bear or to get a client close to a site. In their statement, the owners wrote:

> *"I am trying to make a living using a natural resource of this province, I am following the rules that I'm given, and I am doing it with as little impact on the environment as I can. These areas are beautiful and are only used by a select few, true hikers, canoers, fishermen, and hunters, as they are not easily accessed. Hunting is allowed in these areas, I just can't use bait for bears, which means I can't hunt them. Why am I being pushed out of these areas? Can there not be some provision made to allow me to continue working in these areas? To continue hunting in the traditional way?" (M & B Mason, Pers. Comm., 2008)*

Goldeneye Guide Service is concerned that the land base available for relocation is getting smaller because of the CWA. The company stresses that not all areas are suitable bear habitat, or meet their needs from a hunting perspective. If the currently proposed boundaries are designated, this will end part of their baiting/hunting for bear in the area, and will eliminate baiting/hunting options for the future. This will require the company to find other areas for the location of bait sites.

Between 1993 and 2000 a wilderness trip guiding business also operated in and around the CWA (B. Graves, Pers. Comm., 2008). The business provided one to five day wilderness canoe trips, providing all the necessary gear and food. Three to five trips were conducted each summer, using mainly the southern portion of the CWA and some of the surrounding areas. However, the business is no longer in operation. One member of the Eastern Shore Forest Watch Association reportedly has an eco-tourism business plan for the area (K. Thompson, Pers. Comm., 2008).

Overall, the predicted effects on tourism values with designation are positive as protection will help conserve and potentially enhance the wilderness assets in the area, and the formal designation is expected to increase public recognition and knowledge of the area. However, Goldeneye Guide Service will likely be negatively impacted, as bear baiting will not be permitted within the WA and they will be forced to relocate their operations and bear the associated costs.

4.2.1.4 Research and Education

Many organizations use the Ship Harbour Long Lake CWA for research and educational purposes. For example, the Eastern Shore Forest Watch Association directs researchers to the CWA, and conducts

educational work with youth groups year round (K. Thompson, Pers. Comm., 2008). The following additional research and education activities have been conducted in the CWA:

- From July 9 to 11, 2008, NSE's Protected Areas Branch invited 16 scientists, volunteers and staff to conduct a multidisciplinary biological inventory of the CWA. Species inventories were conducted for lichens, bryophytes, vascular plants, insects, amphibians, and birds.
- NSE and the Mersey Tobeatic Research Institute (MTRI) conducted a joint research project on boreal felt lichen.
- Rare species surveys conducted at various times.
- The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) conducted a research project on boreal felt lichen.
- Members of Trout Nova Scotia monitor the health and quality of the trout population in the lakes within the CWA.
- The Nova Scotia Fisheries & Aquaculture, Inland Fisheries Division completed a report on the sport trout fishery in and around the CWA in 2007 (MacMillan *et. al.* 2007).

Designation of the CWA will help protect the diversity of ecosystems, flora and fauna for future research and educational use.

4.2.1.5 Commercial Fishing

The lower system below Lake Charlotte, outside of the CWA, supports a commercial gaspereau harvest with two trap stands, as well as a commercial adult eel fishery. There is one commercial eel harvester on the Eastern Shore who uses fyke nets set in several tidal waters connected to but outside of the CWA (T. Owen, Pers. Comm., 2008). The fisherman holds a commercial eel harvesting license that allows him to set pots and trap nets. The license is valid for all of Halifax County, and the licensee uses a truck and boat to access fishing gear and transport catch. The following lakes associated with the CWA are used for commercial eel fishing, but all are excluded from the proposed CWA boundary:

- Scraggy Lake;
- Ship Harbour Long Lake;
- Logging Lake area; and
- Salmon River Lake.

Access to these areas requires roads that will be excluded from the CWA or which will permit vehicle access. Thus, there are no anticipated impacts of designation on the existing commercial eel fishery.

4.2.2 Individual Values

4.2.2.1 Vehicle and Bicycle Use

ATV use, and to a lesser extent snowmobile use, occurs in a number of areas within the CWA. Bicycle use is believed to be limited. A regional off-highway vehicle trail network extends both to the east and west of Lake Charlotte and north around the CWA. The major north-south connector routes through the CWA are Murchyville Road and Lays Lake Road (see Figure 4.2).

Musquodoboit Trailways Association maintains a trail network in the southwestern portion of the CWA. Bicycles are allowed on the rail trail (main trail), which is excluded from the CWA and adjacent White Lake Wilderness Area. All of these trails are limited to non-motorized use. The two most popular trails are the Admiral Lake Loop (5 km) and the Bayer Lake Loop (1 km) within the CWA. These also link to the Granite Ridge trail, through White Lake Wilderness Area. The association would like these trails to remain for non-motorized use (M. Berrigan, Pers. Comm., 2008). The association believes that protection of the area will improve with designation, and that it may be able to expand its trail network into the WA.

As discussed at a meeting between NSE, ATVANS and Lake Charlotte ATV Association, most ATV use in the area is on existing forest access roads and frozen lakes in winter. Much of the trail network is seasonal. In winter, some snowmobile use occurs on the same routes, when conditions allow. These trails are not groomed. (O. Maass, Pers. Comm., 2008) (see Figure 4.2).

A letter to the Minister of the Environment from Wayne Rock, President of ATVANS stated that the organization supports the Lake Charlotte ATV Association in its position that the main trails through the CWA "are critical to the connectivity with other riding areas and form an important piece of the puzzle in the overall trail strategy for that geographical area" (letter dated March 11, 2008). The letter also notes that the club is a member of good standing, carrying a $5 million Commercial General Liability Insurance Policy, and would be ideal stewards to upgrade and maintain trails to a multi-use standard.

It is intended that the existing Murchyville Road, Lays Lake Road and the road to Logging Lake be excluded from the CWA. This will allow ATV users to maintain a connected trail system throughout the area. A map-based review of known trails within the CWA (Figure 4.2) shows that all regional four-season ATV routes are outside the proposed boundaries, including Murchyville Road and Lays Lake Road. Some winter routes and some four-season spur (dead end) trails are within the CWA (NSE meeting notes, January 8, 2008). ATVANS has stated that it sees no negative impacts associated with the designation if current suggested boundaries are maintained (C. Robar, Pers. Comm., 2008). To maintain trail connections between communities, Lake Charlotte ATV Association has asked for continued access on the Logging Lake to Salmon River Lake winter trail. Use of this route relies on safe ice conditions on lakes.

Several lake access roads (short spurs) are also important to users, including roads to the south end of Scraggy Lake, to the north end of Ship Harbour Long Lake, and to Salmon River Lake. NSE intends to ensure continued public vehicle access to these lakes.

In addition, a number of secondary ATV routes have been identified within the CWA. ATVs are used for easy access to some of the lakes and rivers within the CWA for fishing and hunting, as well as for other outdoor recreational uses.

ATV use along excluded roads will allow users to maintain a connected ATV trail system in the area. Also, connections with other trails systems along the Eastern Shore will not be affected. However, as intended, designation will result in limiting vehicle access within the CWA. The use of side or spur trails by anglers and hunters will not be permitted. Those relying on vehicle access to lakes or hunting areas within the CWA will be required to find alternate suitable access or relocate their activities to other areas.

The Ecology Action Centre (EAC), Eastern Shore Forest Watch Association (ESFWA), Lake Charlotte ATV Club, and ATVANS recently reached an agreement regarding off-highway vehicle (OHV) trails and

proposed land additions to the SHLL CWA, outlined in a letter of agreement. These recommendations will be reviewed by NSE.

4.2.2.2 Fishing, Hunting and Trapping

A number of organizations and individuals have non-commercial fishing, hunting and trapping interests in the CWA. Hunting (*e.g.,* deer, bear and birds) and trapping (*e.g.,* snowshoe hare) are believed to occur throughout the CWA; however, specific information on the characteristics of these activities is not readily available.

The Department of Fisheries and Oceans (DFO) identifies the Ship Harbour Long Lake CWA as the best of the three CWAs for fishing (T. Owen, Pers. Comm., 2008). No exotic species of fish are present and existing cold water fish represent the full gamut of fish species in Eastern Nova Scotia. There is stocked, landlocked population of salmon in Lake Charlotte.

Fish River, which is largely within the CWA, provides habitat for speckled trout, rainbow smelt, Atlantic salmon, gaspereau, shad, and catadromous american eels. Stocks vary in health and size due, in part, to a pH reduction in most of the lake system and angling pressure. All of the eastern shore freshwater fish are also found in this river, including white and yellow perch, brown bullheads, white suckers, golden and common shiners, killifish, and other minnow species. There are no documented cases of non-indigenous invasive species captured by anglers, though there are reports of small mouth bass being illegally introduced into Scraggy Lake. Reports of Atlantic salmon caught here are rare, but still occur every year. Viable sea (speckled) trout run from Ship Harbour to Lake Charlotte (T. Owen, Pers. Comm., 2008).

The inland fishery for eels on the eastern shore is very small and primarily recreational, using baited pots in or close to salt water. Each recreational license is restricted to four eel pots and valid only for a specific county. Approximately 50 to 100 recreational eel licenses are currently issued for Halifax County (O. Maass, Pers. Comm., 2008). It is unknown how many, if any, recreational eel harvesters are active within the CWA; however, given that fishing primarily occurs in salt or brackish waters, substantial use of waters within the CWA is not expected.

Trout Nova Scotia reports that approximately 30 members actively fish within the CWA, an average of three times per season, with an average trip length of two days (G. Taylor, Pers. Comm., 2008). Most fishing is done in Fish River and Scraggy Lake. Trout Nova Scotia ranks Ship Harbour Long Lake CWA as the best of the three CWAs in terms of the trout fishery, based on anglers' knowledge (G. Taylor, Pers. Comm., 2008).

A study of angling activity in the vicinity of the Ship Harbour Long Lake CWA was recently completed (MacMillan et. al. 2007). A forestry road that joins Murchyville to Mooseland represents an access point to popular angling destinations on several lakes located in or adjacent to the Tangier Grand Lake WA in Halifax County. Angler check points were set up in 1979 and 2007 along this road to assess the catches of anglers in this region. The purpose of the study was to determine if there have been any significant changes to the trout fishery. Angler catches were assessed during a period of heavy angler activity on weekends and holidays from May 6th to June 10th, 2007. In 2007, the number of trout caught per hour of angling was found to be 0.64, ranging from 0 to 2.75 trout. The mean number of hours per angling day was four, and ranged from one to 10 hours. The total mean number of trout per individual angler was four, ranging from zero to 17 trout caught per angler. Results indicate that

anglers are releasing a much greater proportion of their catch than in the past, and suggest that there has been very little change in the size of the catch, catch per unit effort, and growth rate of trout in this area.

Because hunting, fishing and trapping are generally permitted within WAs, impacts are expected to be minimal. The only predicted negative effects on hunting, fishing and trapping values are in relation to motorized vehicle access into the CWA as ATVs are used by some to access hunting and fishing grounds and/or to transport prey. Restrictions on the use of off-highway vehicles can be expected to restrict hunting, fishing and trapping activities in forest areas that are mainly accessible by vehicle. However, it should be emphasized that the existing connected ATV trail and road network will be retained (see Section 4.2.2.1).

4.2.2.3 Wilderness Recreation

The Ship Harbour Long Lake CWA is popular among seasoned outdoor adventurers for canoeing, kayaking and camping, as well as some snowshoeing and cross-country skiing. In particular, there are excellent canoeing opportunities on a system of interconnected lakes and down Fish River, with regional linkages to Tangier Grand Lake Wilderness Area and White Lake Wilderness Area. In addition, the existing, managed hiking trails in the southwestern portion of the CWA are very popular for hiking and picnicking.

Communication with CKNS revealed that members use Ship Harbour Long Lake area all year long for a variety of activities, including canoeing, kayaking, hiking, angling, photography, and nature study. The organization is in full support of designating this area. If the area became unavailable, it was noted that current users would have to travel farther for a comparable opportunity. Conversely, CKNS believes the designation of this special area will increase use, and are willing to maintain portages along with other users.

The Musquodoboit Trailways Association (MTA) maintains the above-mentioned trail network in the southwest portion of the CWA. In total, MTA maintains about 9 km of trails within the southwestern portion of the CWA, as well as 15 km of trails within the adjoining White Lake Wilderness Area and Gibraltar Rock Park Reserve. These hiking trails originate off the 15 km rail trail bordering Musquodoboit River, also managed by MTA. Hiking trails within the CWA include the Admiral Lake Trail and Bayers Lake Trail. These trails are all used for hiking and snowshoeing. The rail trail, which is outside the CWA, is also used for biking and cross-country skiing (Figure 4.2).

Approximately 12 of the 25 members of the association (all within 10 km of the CWA) use the trails daily, on average. The trails are also extensively used by the public and by climbing clubs, Dartmouth Volksmarch Walking Club, Bike Nova Scotia, cross-country ski groups and school groups. There is a potential opportunity for trail expansion both within White Lake Wilderness Area and the Ship Harbour Long Lake CWA. Currently, the association has a trail management agreement with NSDNR for trails within the CWA and several other sections of trail, and with NSE for 12 km of trail within White Lake Wilderness Area.

The Musquodoboit Trailways Association believes the CWA is of special value. Important features include geologic features (granite ridges, exposed Meguma Group bedrock) and old forest stands. Currently, the association is exploring the option for people to spend nights at designated points along the established trails while on wilderness hikes. Ideally, there would be no motorized trail use and the

focus in the area would be conservation, recognizing the potential for ecotourism as it is a large and relatively untouched area. If designated, MTA believes protection will be better and stronger, and would provide opportunity for expansion of the association's hiking trail network into the new WA (M. Berrigan, Pers. Comm., 2008).

The Eastern Shore Forest Watch Association is a group of citizens supporting a vision of sustainable forest practices. Established in 1998, this registered non-profit organization operates with 70 to 100 paid members who live within approximately 10 to 100 km from the CWA (K. Thompson, Pers. Comm., 2008). Members walk, paddle, camp, angle, direct researchers to the area, and conduct educational work with youth groups all year round. Fish River and Long Lake are the primary areas used because of the access through Lake Charlotte. Occasional access occurs from the upper end of the CWA.

The CWA includes 15 campsite leases, 13 of which have camp structures (see Section 4.1.3). Camp structures also exist on some of the more than one dozen private land inholdings within the CWA, as well as on some adjacent properties (particularly at Scraggy Lake). These camps are generally used for recreation, including sport fishing, boating and general camp use. In many instances, camp access is via routes that cross portions of the CWA. Under existing policy, vehicle access across WA lands is permitted on existing routes to access campsite leases within wilderness areas or private lands surrounded by wilderness area lands. Designation of the CWA is not expected to affect use and enjoyment of campsite leases within the CWA or other camps on adjacent lands.

Designation of the CWA will positively impact wilderness recreation values by protecting existing uses and allowing for new opportunities for increased use (*e.g.,* further authorized development of trail networks). The current use by individuals and members of outdoor organizations for canoeing, kayaking, hiking and snowshoeing is an important value of the CWA to maintain. Designation will protect the existing wilderness that forms the foundation for these activities.

4.2.3 Societal Values

4.2.3.1 Cultural and Heritage

The Ship Harbour Long Lake CWA contains a number of significant cultural heritage features. Most important of these are archaeologically and historically significant Mi'kmaq sites found in the CWA or in close proximity to its boundaries. Artifacts which have been found demonstrate continuous occupation dating back 1,300 years before present. Historic European artifacts have also been found (S. Powell, Pers. Comm., 2008a).

The archeological values on these sites are protected under the *Special Places Protection Act*. None of these sites have been legally designated, but prohibitions on the removal or disturbance of heritage objects unless authorized by permit extends to undesignated areas. These sites are highly valued and are considered sensitive to disturbance, particularly from erosion causing activities, such as heavy foot traffic or camping, and site development (S. Powell, Pers. Comm., 2008a). Some of these archeological sites have notable potential for research and education values (S. Powell, Pers. Comm., 2008a). Designation of the Ship Harbour Long Lake CWA will help protect these sites and maintain these culture and heritage values.

There is also evidence of historic timber harvesting, an early sawmill, and a series of dams in or around the CWA. The area also has a long history of wilderness travel for hunting, trapping, fishing, and wilderness recreation. The opportunities provided by this area for such uses over time contribute to the cultural heritage of the province. The designation of this CWA will protect these traditional wilderness use opportunities (NSE 2008c).

4.2.3.2 Existence

All of the above-mentioned organizations and associations that use the CWA are concerned with the preservation and conservation of the area for its intrinsic value, and so that it may be used and enjoyed by future generations. Specifically, Trout Nova Scotia is concerned with preserving the trout fishery in the area for the benefit of future generations (G. Taylor, Pers. Comm., 2008). A Government of Nova Scotia news release on behalf of NSDNR and NSE notes that the area has been the focus of a grassroots protection campaign since 1999 (DNR/NSE, December 7, 2007). CPAWS is concerned with the conservation of biodiversity in the area (C. Miller, Pers. Comm., 2008) and believes ecosystem protection at such a large scale is rare and irreplaceable if lost.

The existence values associated with the Ship Harbour Long Lake CWA are generally as described in Section 2.3.2. The available information does not permit further quantification or description of these values. However, designation of the CWA will help ensure the protection and conservation of the existence values into the future.

4.2.4 Ecosystem service values

4.2.4.1 Climate Change Mitigation

The total size of the land parcel that comprises the Ship Harbour Long Lake CWA is approximately 14,187 ha, of which about 9640 ha is potential working forest area. Using the damage cost avoidance estimate for the global value of carbon sequestration, protection has a present value of approximately $47 to $94 million over the managed forest option.[7] Using the carbon credit market value estimate, protection has a present value of approximately $2.2 to $4.3 million over the managed forest option (see Section 2.4.1 for details of assumptions).[8]

Designation of this CWA is predicted to increase climate change mitigation values. The protection of forests helps ensure continued and increased carbon sequestration in the area.

4.2.4.2 Water Regulation

Within the Ship Harbour Long Lake CWA there are approximately 1,148 ha of wetland, over 50 lakes with undeveloped shoreline, and hundreds of kilometres of streams and rivers. The major wetlands and bogs are found primarily in the Flat Iron Lakes and Scraggy Lake areas. The forested areas and wetlands help to control erosion, maintain water quality, and regulate water flows. This contributes to the protection of water quality and water supply in downstream lakes and waterways.

[7] Calculated as damage avoidance value of ($325/tC)(15-30tC/ha)(9640ha).

[8] Calculated as carbon market value of ($15/tC)(15-30tC/ha)(9640ha).

With the designation of the CWA, water regulation values are predicted to be conserved and maintained. Protection of the watershed will allow it to continue to function as needed, providing necessary water, drainage, and wildlife habitats in the area.

4.2.4.3 Biodiversity Maintenance

The Ship Harbour Long Lake CWA contains stands of old forest, large wetland complexes, raised bogs, and numerous lakes and waterways. These features provide habitat for rare and globally endangered species (NSE 2008b).

The CWA contains portions of four of the province's Natural Landscapes (NSE 2008b):

- Eastern Shore Ridge;
- Eastern Shore Drumlins (Tangier River);
- Central Quartzite Hills and Plains (Fish River); and
- Eastern Shore Beaches.

The CWA captures the following ecosystems that are not found in existing protected areas:

- Imperfectly drained deciduous forest ridges;
- Imperfectly drained softwood forest ridges;
- Well drained softwood forest ridges;
- Well drained softwood forest hummocks;
- Shrub bog;
- Heath barren ridges; and
- Treed fen (NSE 2008b).

Twelve significant ecosite types were identified in the CWA (NSE 2008b). These include coastal barren, coastal open bog, coastal open fen, coastal shrub bog, coastal shrub fen, coastal treed bog, coastal treed fen, fen-bog complex, inland barren, lake island, red pine forest, and vernal pond.[9]

Old forest stands are scattered throughout the CWA, and are concentrated along Fish River, northwest of Scraggy Lake, and near Ship Harbour Long Lake. Many of the stands are red spruce-dominated, though white pine and mixed hardwood/softwood stands also occur. The CWA contains 14 species of provincially-listed red and yellow lichens, including boreal felt lichen (NSE 2008b). Species listed as red are known or believed to be at risk. Species listed as yellow are known or believed to be particularly sensitive to human activities or natural events.

The boreal felt lichen is listed as critically endangered by the International Union for the Conservation of Nature (IUCN), and the Atlantic population of this lichen has been listed as endangered under the federal *Species at Risk Act* and the *Nova Scotia Endangered Species Act*.

[9] Note that "coastal" refers to ecosites that occur within a zone of coastal influence; they are not necessarily located directly on the coast.

Other rare or uncommon species include the common nighthawk, rusty blackbird, mainland moose, Atlantic salmon, and several species of dragonflies (NSE 2008b). The rare plant *Euthamia tenuifolia* (also known as *Euthamia caroliniana*, general status yellow) has been recorded at Lake Charlotte. There is a known deer wintering area along Fish River between Scraggy Lake and Lake Charlotte and speckled trout, gaspereau and salmon inhabit Fish River (L. Benjamin, Pers. Comm., 2008).

The Eastern Shore Forest Watch Association considers the CWA the jewel of the eastern shore's crown due to important features such as lakes, rivers, diverse geography, large mammals, clean water, large trees, and rare species (K. Thompson, Pers. Comm., 2008). According to the association, it is one of the few remaining areas that is not being decimated by logging.

With the designation of the CWA, biodiversity values are predicted to be conserved and maintained. Designation helps ensure the protection of flora, fauna and ecosystems within the CWA.

4.3 Estimated Changes with Designation

Table 4.3 presents a summary of the potential changes to current values with designation of the Ship Harbour Long Lake CWA.

TABLE 4.3 Summary of Socioeconomic Values: Ship Harbour Long Lake

Value	Current Situation	With Designation	Without Designation
Forestry	▪ 68% of the area is harvestable. ▪ Includes significant areas of older forest.	▪ Maintain or increase forest diversity and age. ▪ Estimated wood supply loss of ~19,000 m^3/year. ▪ Loss of stumpage value approximately $18.3 million.	▪ Area remains available for forest harvesting ▪ Stumpage value may be realized.
Mining	▪ Less than1,000 ha deemed to be "hot spots" for mineral potential. ▪ Current exploration activities by mineral license owners.	▪ Existing mineral licenses honoured, but mineral rights holders may have difficulty attracting investment. ▪ Potential loss of investment by license owners. ▪ Potential for lost development opportunities for mining in the area.	▪ Continual exploration and maintenance of claims and licenses. ▪ Possibility of realizing the full mining development potential of the area.
Tourism	▪ Modest amount of existing tourism use. ▪ Includes hiking on managed hiking trail system; and guide company that operates in the area for hunting and photography.	▪ Potential increase in tourism, specifically ecotourism. ▪ Loss of value associated with guided bear hunting trips within WA.	▪ Continued hiking use, as well as use of area by guide company.
Research and Education	▪ Some use for research and education.	▪ Increased opportunities for research and education.	▪ Less opportunity for research and education as competing resource use and development occurs.

TABLE 4.3 Summary of Socioeconomic Values: Ship Harbour Long Lake

Value	Current Situation	With Designation	Without Designation
Vehicle and Bicycle Use	▪ Extensive off-highway vehicle use in and around the CWA, including a regional trail network.	▪ Main ATV routes excluded from WA. ▪ Limited or no ATV use permitted on trail spurs. ▪ Enforcement of unauthorized ATV use may increase.	▪ Current off-highway vehicle use may continue.
Fishing, Hunting and Trapping	▪ Popular area for anglers. ▪ Commercial eel licensed fisherman in the area. ▪ Hunting and trapping occurs in area (unknown levels).	▪ Fishing, hunting and trapping generally permitted within WA. ▪ Possible change in use patterns and levels due to restrictions on vehicle and ATV use. ▪ No effect on commercial eel fishery.	▪ Current use patterns likely to continue.
Wilderness Recreation	▪ Existing extensive wilderness recreation use, including canoeing, kayaking, hiking, camping, picnicking and snowshoeing. ▪ 15 camp leases.	▪ Protects existing uses and allows for new opportunities for increased use (e.g., further authorized development of trail or portage networks)	▪ Likely decline in use over time as competing resource use and development occurs.
Cultural Heritage	▪ Place of special value for local residents. ▪ History of hunting, fishing, trapping, canoeing and wilderness travel. ▪ Contains significant historical and archaeological sites (Mi'kmaq and European).	▪ Helps protect sites of cultural value. ▪ Significant historic and archeological sites will be better protected. ▪ Helps protect wilderness recreation heritage.	▪ Risk that the cultural heritage of this area will be negatively impacted as development occurs. ▪ Potential damage to sensitive archeological and historical sites.
Existence	▪ Grassroots protection campaign for the area since 1999. ▪ High biodiversity value. ▪ Desire to maintain wildlife for use and enjoyment of future generations.	▪ Conservation of existing ecosystems and related flora and fauna.	▪ Expected loss of biodiversity as competing resource use and development occurs.
Climate Change Mitigation	▪ Existing carbon sequestering function of forest.	▪ With the damage cost avoidance estimate, protection has a present value of ~ $47 to $94 million. ▪ Present value of ~ $2.2 to $4.3 million using the carbon credit market value estimate.	▪ Less carbon sequestration by forest.
Water Regulation	▪ Large watershed includes lakes, rivers and wetlands. ▪ More than 50 lakes with undeveloped shoreline.	▪ Help secure erosion control, protect water quality, and regulate downstream water flows by maintaining existing forests and plant life in the area.	▪ Less water regulation in the area as forests are harvested or the area is otherwise developed. ▪ Increased risk of poor water quality due to increased sediment from erosion.

TABLE 4.3 Summary of Socioeconomic Values: Ship Harbour Long Lake

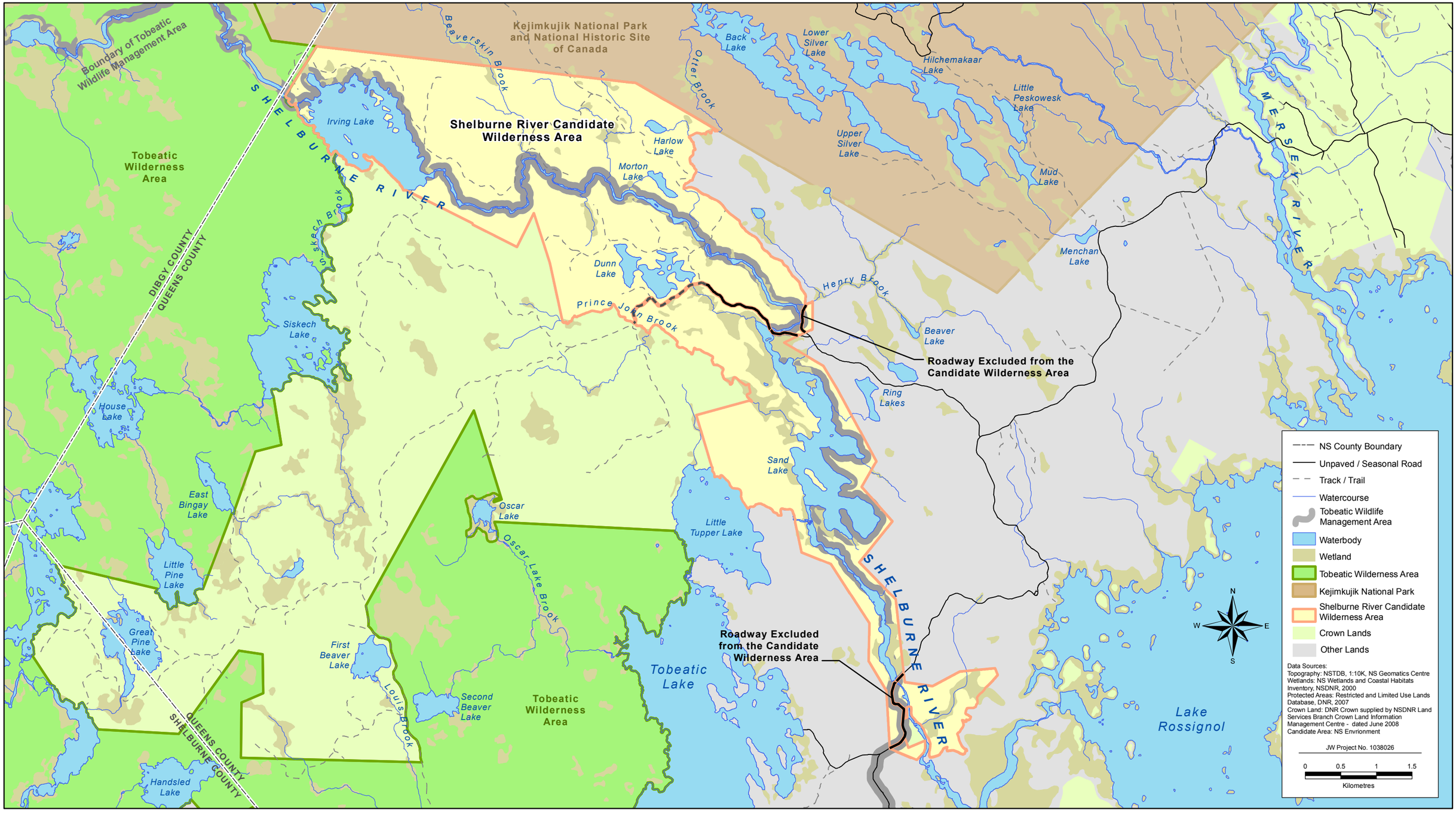
Value	Current Situation	With Designation	Without Designation
Biodiversity Maintenance	▪ Contains seven ecosystem types not currently protected in Nova Scotia. ▪ Includes 12 significant ecosites. ▪ Red spruce dominated, white pine, and mixed hardwood/softwood forest stands. ▪ Many endangered and rare species of lichens ▪ Other rare and uncommon species include Atlantic salmon, rusty blackbird, and mainland moose.	▪ Maintain and potentially increase biodiversity in the CWA. ▪ Help protect endangered and rare species.	▪ Existing biodiversity threatened as competing resource use and development occurs. ▪ Local conservation of rare and endangered species threatened.

5.0 SHELBURNE RIVER CANDIDATE WILDERNESS AREA

5.1 General Description

5.1.1 Geographic Location

The Shelburne River CWA is located approximately 25 km southwest of Caledonia, in the northwest portion of Queens County (Figure 5.1). This land parcel is located between Kejimkujik National Park and National Historic Site of Canada (Kejimkujik), Tobeatic WA, and Lake Rossignol. It is approximately 2,263 ha in size, including lakes and rivers. Crown lands border the CWA to the west and forest lands owned by AbitibiBowater surround much of the eastern portion of the CWA. Also, NSPI owns some adjacent lands near the mouth of Shelburne River at Lake Rossignol.



DATE: 17/11/2008 PREPARED BY: L.Kendell NOVA SCOTIA Environment	**Shelburne River Candidate Wilderness Area**	FIGURE NO.: **Figure 5-1** Jacques Whitford

5.1.2 Biophysical Description

The 2,263 ha Shelburne River CWA straddles the lower reaches of Shelburne River and includes all provincial lands along this river downstream of Tobeatic Wilderness Area. It includes Irving, Sand, Dunn, Morton and Harlow Lakes, as well as frontage on Little Tupper Lake and about 40 km of river and lake frontage on Shelburne River. The river, which is a tributary of the Mersey River, flows 53 km through the western interior of the province before draining into Lake Rossignol. Of Nova Scotia's 80 Natural Landscapes, the CWA includes portions of South Mountain, Shelburne River Plain, Lake Rossignol Hills, and Sable River Basin Natural Landscapes. The majority of the CWA is underlain by Neoproterozoic to Early Ordovician rocks of the Meguma Supergroup, with granitic intrusions of the Devonian South Mountain Batholith along its western side (NSDNR 2008b).

The CWA is comprised of more than 1,600 ha of forested land, large wetlands, and significant lake and river frontage. It includes a number of old-growth hemlock stands, some trees with trunks more than 1 m in diameter. The area supports wildlife that requires large tracts of interior, unfragmented habitats and undisturbed wetlands. The area is known for its black bear, and is on the fringes of a significant population of the endangered mainland moose, centred around the upper reaches of Shelburne River. In recognition of these and other natural heritage features, in 1997 Shelburne River was designated as a Canadian Heritage River under the federal-provincial Heritage Rivers Program.

5.1.3 Encumbrances and Holdings

The Shelburne River CWA includes 1,636 ha of land purchased by the Province in 2007 from Bowater Mersey Paper Company Limited (now AbitibiBowater) with the intention of protecting these lands. The CWA also includes approximately 257 ha of Crown land additions and several lakes and rivers. The Crown land additions consist of:

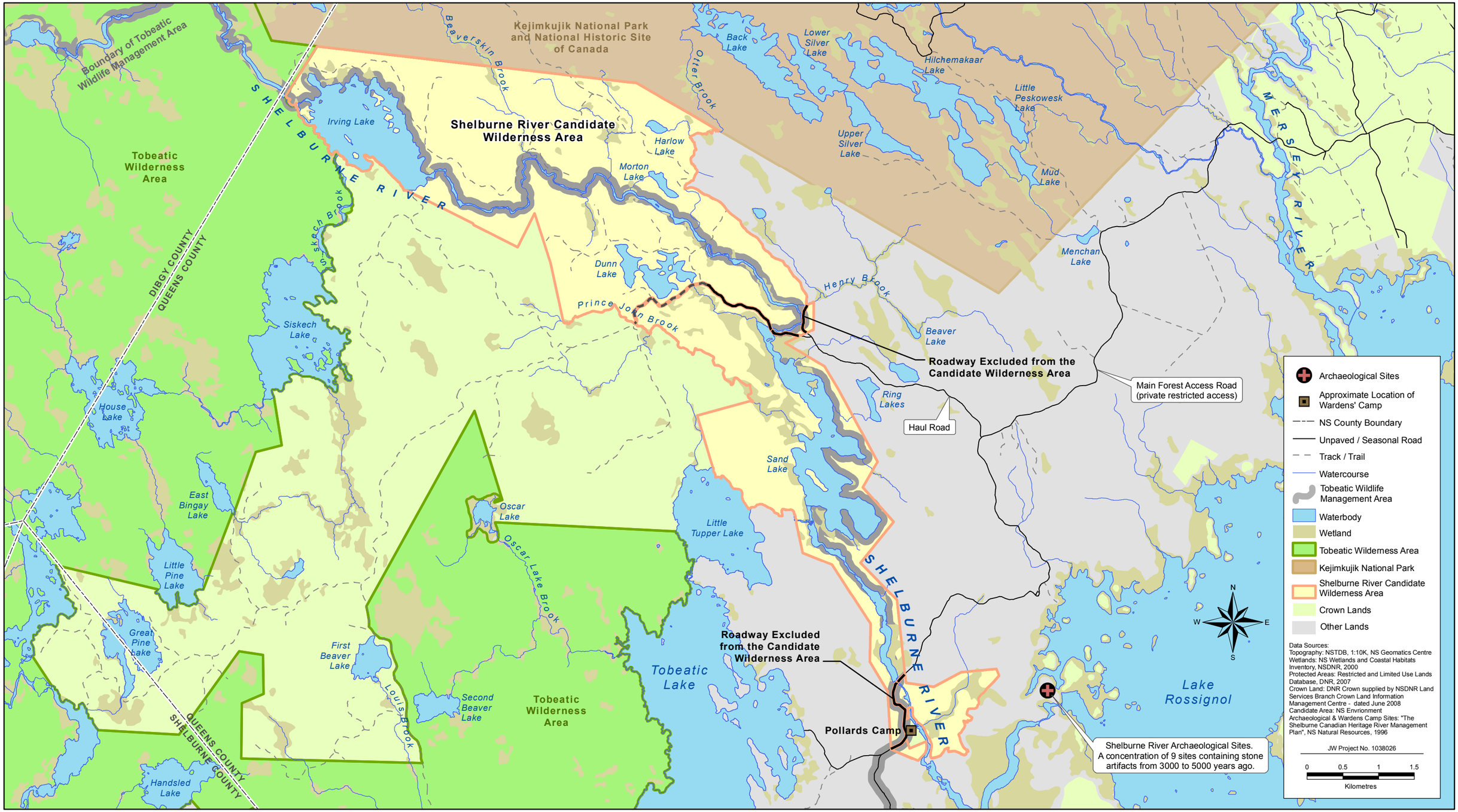
- Irving Lake parcel (136 ha);
- Harlow Lake parcel (32.4 ha);
- Wetland area along Harlow Brook (80 ha);
- Crown islands in Sand Lake (4.7 ha); and
- Crown islands in Irving Lake (4.0 ha) (O. Maass, Pers. Comm., 2008).

As a result of the acquisition from Bowater Mersey Paper Company Limited, almost the entire river corridor of the Shelburne River lies within lands owned by the province. Approximately 5 percent of the river corridor at the mouth of the river is owned by Nova Scotia Power (NSE 2008a).

Three sections of road are excluded from the CWA (see Figure 5.2). A short section of the Masons Road is excluded to provide AbitibiBowater access to its lands north of Henry Brook. A longer section of old road from Mason's Road across the top of Sand Lake and westward past Dunn Lake is excluded to provide access to Crown land west of the CWA. The southern roadway across Pollard's Falls is excluded as this is the main transportation route for AbitibiBowater operations in the Rossignol District.

The CWA also excludes a 19 acre Crown land inholding at Pollards Falls, which includes a camp used for conducting monitoring and enforcement work in the area by NSDNR, NSE and others (Figure 5.2) (G. Joudrey, Pers. Comm., 2008). The camp sleeps 6 to 8 people and includes an outhouse, wood

stove, and propane oven. It is a former warden camp originally built for patrolling the Tobeatic Wildlife Management Area. The cabin is used approximately 10 percent of the year (30 to 40 days) mainly by NSDNR staff.



DATE: 03/12/2008

PREPARED BY: L.Kendell

NOVA SCOTIA Environment

Shelburne River Candidate Wilderness Area Land Uses

FIGURE NO.: **Figure 5-2**

Jacques Whitford

5.2 Current Values

5.2.1 Commercial Values

5.2.1.1 Forestry

The Shelburne River CWA contains approximately 1,582 ha of working forest area and 210,000 m^3 of working forest growing stock (D. Eidt, Pers. Comm., 2008). The total stumpage value of the area has been identified by NSDNR as approximately $3.9 million (NSDNR 2008a). There would be an estimated wood supply loss of approximately 3,200 m^3/year, assuming the area is designated. It should be noted that these volume and stumpage values are maximum estimates. Actual available harvests would depend on the results of regional IRM planning. For example, under the 1996 Shelburne Heritage River Management Plan, commitments were made for modified harvesting and setbacks along the Shelburne River to protect river heritage values, thus reducing total potential harvests. The current composition of the CWA from a covertype perspective is detailed in Table 5.1, below.

TABLE 5.1 Land Base Classification Area Summary: Shelburne River

Land Base Classification Area Summary (%)	
Harvestable softwood	57
Harvestable mixed wood	13
Harvestable hardwood	0
Operational restrictions (20m buffers, steep slopes, etc.)	7
Non-forested	7
Inland water (lakes, double line rivers, *etc.*)	16

5.2.1.2 Mining

Private and public sector geological investigations over the CWA include bedrock and surficial geological mapping, geophysical (*e.g.,* airborne magnetic and radiometric surveys), and geochemical (*e.g.,* glacial till and lake sediment) surveys (NSDNR 2008b). This works assists in predicting the presence of metallic and industrial mineral deposits. The region surrounding the CWA has been the focus of mineral exploration for more than 100 years, and has resulted in the discovery of former-producing gold mines, mineral deposits and occurrences. However, the rock directly under the CWA does not host known mineral deposits or occurrences (NSDNR 2008b).

The most significant potential resource development within and adjacent to the CWA is the potential for economically-viable deposits of lead, zinc, barium, gold and silver along the Tobeatic Fault Zone, which is interpreted to cross a southern portion of the CWA. Most of the mineral occurrences discovered to date are located south of the CWA.

NSDNR's Mineral Resources Branch has indicated that it is satisfied with the proposed CWA boundaries, despite good mineral potential for breccia-type polymetallic mineralization, and moderate potential for quartz-kaolin deposits. Peat and aggregate potential also exists in the CWA (NSDNR 2008b).

The Mining Association of Nova Scotia (MANS) is concerned with the potential loss of economic opportunity with the designation of all three CWAs. Further, they advocate for permission to explore all CWAs for uranium if the current moratorium for uranium exploration is lifted in Nova Scotia.

While there is a small potential for loss of economic opportunity if the CWA is closed off to mining exploration and development, there are currently no active exploration licenses or developed or planned mines in or adjacent to the Shelburne River CWA.

5.2.1.3 Tourism

Commercial tourism operator activities have been fairly limited within Shelburne River CWA. Most commercial outfitting in the region takes place within Kejimkujik National Park, where more facilities and interpretation support larger groups. Nevertheless, several companies offer guided canoeing and angling trips through Tobeatic Wilderness Area and Shelburne River.

One such company is Hinterland Adventures, based in Weymouth, NS. For many years, they have offered a guided Shelburne River trip as part of their programming. Another is Cambrian Survival, a UK company based out of Wales, which conducts guided wilderness trips worldwide (http://www.cambriansurvival.co.uk/welcome.html). Cambrian Survival planned a trip for the Shelburne River area this year (October 4th-18th, 2008) to mark the centennial of the publishing of *The Tent Dwellers.*

The Tent Dwellers, by Albert Bigelow Paine, is a book chronicling adventures of a canoe and trout fishing trip through the interior of southwestern Nova Scotia in the early 1900s. Public awareness of the Shelburne River likely increased as a result of this book, and Tent Dwellers Festival activities for the centennial celebrations are expected to attract more people to the area. Other commercial tourism operators in the region are offering packages linked to this event.

No further information is available regarding specific commercial tourism activities within Shelburne River CWA. However, the CWA is an integral part of an extensive system of interconnected lakes and rivers that link with Kejimkujik National Park and Tobeatic Wilderness Area. There is a long tradition of canoeing and fishing through this region.

Overall, the predicted effects on tourism values with designation are positive as protection will help conserve and potentially enhance the wilderness assets in the area, and the formal designation is expected to increase public recognition and knowledge of the area.

5.2.1.4 Research and Education

There has been a fair amount of research done in the area over the years by Bowater and the Mersey Tobeatic Research Institute (MTRI) (L. Helmer, Pers. Comm., 2008). The Southwest Nova Biosphere Reserve Association (SNBRA) has also been active in the area, supporting citizen-science and improved understanding and appreciation of protected areas. Bowater and other industry partners have met and exceeded objectives outlined in NSE's Shelburne River Management Plan, and have sponsored research on the natural and cultural values of the river and surrounding lands. The ranger cabins along the river (currently excluded from the CWA) are used for enforcement and compliance, but also as a base for external researchers (L. Helmer, Pers. Comm., 2008).

The following specific research activities have been conducted in the CWA:

- Research and monitoring projects focused on topics such as lichens, species at risk, the effects of dams, and forestry practices (Kejimkujik National Park (Parks Canada), NSE, NSDNR and academic partners);
- A coastal plain flora study, old dam work studies (MTRI), lake water quality (MTRI and Acadia University), loon productivity (MTRI), wildlife studies (MTRI), and moose and deer studies (NSDNR);
- Rare species surveys; and
- Monitoring of the health and quality of the trout population in the Shelburne River (Members of Trout Nova Scotia).

With a membership of 40 agencies and 150 groups or individuals, MTRI sees the area as important to protect due to the Heritage River and pristine wilderness qualities (A. Lavers, Pers. Comm., 2008). Their primary functions include research and public education and dissemination of their findings. Ideally for this group, the roads in the area would be decommissioned and the bridge either taken out or mitigated to improve environmental effects. The connectivity of Kejimkujik Nation Park to the Tobeatic Wilderness Area is important to MTRI, and it would like to assist by playing an advisory role as the designation process continues (A. Lavers, Pers. Comm., 2008).

Designation of the CWA will help protect the diversity of ecosystems, flora and fauna for future research and educational use. Protection would provide a land base suitable for long-term studies of ecosystems in a relatively undisturbed, natural environment. This may be particularly attractive to researchers in the context of the surrounding working landscape.

5.2.2 Individual Values

5.2.2.1 Vehicle and Bicycle Use

ATV use appears to be concentrated on the three sections of road that are excluded roads from the CWA. These roads provide access primarily to Dunn Lake, Sand Lake, and Tobeatic Lake.

AbitibiBowater Ltd., which was the previous owner of most of the CWA, generally did not allow public vehicle use on their lands, and prohibited public ATV use. A limited amount of unauthorized travel has nevertheless occurred on the existing old roads and across the two bridges at Pollard's Falls and Sand Lake (D. Dagley, Pers. Comm., 2008; L. Helmer, Pers. Comm., 2008; S. Merry, Pers. Comm., 2008).

Some bicycle use may also occur within the CWA corridor (L. Helmer, Pers. Comm., 2008).

Designation may result in limiting vehicle access into the CWA. Given both the history of vehicle restrictions in the area and the exclusion of roads from the CWA, impacts on current vehicle use are predicted to be minimal.

5.2.2.2 Fishing, Hunting and Trapping

Fishing, hunting and trapping occur on Crown and private lands in and around the CWA. The CWA is known in particular for trout (mainly downstream of Irving Lake) and, secondarily, for perch. Trout populations are considered good, but are not found as readily above Sand Lake (D. Dagley, Pers.

Comm., 2008). Deer, rabbit, ruffled grouse, and occasionally ducks are hunted, while trapping targets beaver, muskrat, and mink (D. Dagley, Pers. Comm., 2008).

The introduction of pickerel and bass into the Shelburne River has been confirmed by DFO (T. Owen, Pers. Comm., 2008). Trout populations are in trouble due to warm temperatures and pH changes (increased acidity). Throughout the southern mainland of the province, approximately 70 percent of the speckled trout population has been lost, so the CWA is believed to be a critical sanctuary for the species (T. Owens, Pers. Comm., 2008).

The Queens County Fish and Game Association uses the area for hunting, where permitted, and some angling activities (D. Dagley, Pers. Comm., 2008). The angling activities target trout and some perch, particularly in the river from Tupper to Sand Lake. The association mainly uses the east portion of the CWA for hunting, on former Bowater lands. Access is extremely limited as a key is needed for the gate and Bowater's policies have changed around who has access (*i.e.,* managers, superintendents, family and friends of employees). Bowater also provided keys for bear hunting, as there is a healthy bear population in the area (L. Helmer, Pers. Comm., 2008).

Trout Nova Scotia estimates that an average of six of its members use the area once per season, but acknowledges that the trout in the area are already in peril (G. Taylor, Pers. Comm., 2008). More specifically, the trout are believed to be under stress because of high acidity levels and perhaps human impact caused primarily by forestry (G. Taylor, Pers. Comm., 2008).

Overall, the predicted impacts of designating the Shelburne River CWA on hunting, fishing and trapping values are positive. The only predicted potential negative effects are in relation to motorized vehicle access into the CWA but, as stated previously, current vehicle access is primarily along road sections that are to be excluded from the CWA. Fishing and hunting access by canoe to the area will be unaffected. Conversely, the health of wildlife populations may improve with designation, as they will be protected from impacts such as development and forestry activities. Healthy fish and game populations will benefit hunters, trappers and fishers.

5.2.2.3 Wilderness Recreation

The Shelburne River is very popular for canoeing and kayaking, as well as camping and wilderness viewing. Three local groups provided insight into these opportunities.

Queens County Fish and Game Association has approximately 30 members who live 10 to 70 km from the CWA (D. Dagley, Pers. Comm., 2008). They use the area mainly for canoeing, but also for hiking, fishing, wildlife spotting, and participating in watershed studies. The entire area is used during the spring and summer by members approximately twice per season. The Association says the area is historically significant, as the Shelburne River was part of an Aboriginal canoe route, and ranger cabins in the area date back to the 1930s. The Association sees current negative impacts in the CWA resulting from forestry harvesting near the river, easy access for ATVs and others due to the bridge over Shelburne River, acid rain, and illegal ATV use (D. Dagley, Pers. Comm., 2008).

CKNS members also use this area in the spring and fall for recreational purposes (D. Soudek, Pers. Comm., 2008). The group uses the river corridor for paddling and fishing and recognizes the historical association with *The Tent Dwellers*. CKNS sees special value in conserving this area and wants to help to maintain the portages. The group believes the designation may help to increase use. Without

conserving the area and the quality of the environment, members would have to travel much further for their recreation (D. Soudek, Pers. Comm., 2008).

The South Shore Paddlers is a group of recreational paddlers who came together to form a non-profit association (S. Merry, Pers. Comm., 2008). They have approximately 20 members, most of who live in the Bridgewater area, and paddle, fish, and camp in the CWA on a seasonal basis. The group sees the area as having special value because the Shelburne River is a recognized Heritage River (traditional Mi'kmaq and European canoe routes) and it connects Kejimkujik National Park to Tobeatic Wilderness Area. They use the entire area for recreation and pleasure. The South Shore Paddlers see logging, acid rain, litter, access roads, illegal ATV use, and the misuse of the existing road as the current negative factors in the area (S. Merry, Pers. Comm., 2008).

There are approximately six tenting sites located along Irving and Sand Lakes, and further down the river corridor (L. Helmer, Pers. Comm., 2008). There are also at least two geo-caching sites within the CWA.

Designation of the CWA will positively impact outdoor recreational values. Designation will protected the existing wilderness, and the above-mentioned recreational activities will be allowed to continue. Use for wilderness recreation can be expected to increase over time.

5.2.3 Societal Values

5.2.3.1 Cultural and Heritage

The Shelburne River was nominated to the Canadian Heritage Rivers System in 1993 and designated in 1997, based primarily on the following key natural heritage features:

- Undisturbed glacial landforms, such as eskers and outwash plains, and granite barrens; and
- High quality pine and hemlock stands, including the Shelburne River International Biological Program (IBP) site, containing some of the oldest trees in Nova Scotia (NSE 2008a).[10]

Stone artifacts found along the Shelburne River may be more than 5,000 years old, and include arrowheads, knives and scrapers. Mi'kmaq traveled the river by canoe when first European contact was made 400 years ago. They used the river for fishing, and as a key transportation route linking the interior to the coast by the Sissiboo, Tusket, Roseway and Mersey river systems. Europeans continued to use the river for hunting, fishing, trapping and exploration. Beginning in the 19th century, loggers drove logs downstream as a method of transporting them. Mi'kmaq and local settlers guided fishermen, hunters and sightseers in the area to supplement income until after World War II (NSE 2008a).

Although, no extensive archeological surveys have been carried out on the Shelburne River, significant archeological sites do exist in the surrounding area, including hundreds of sites along the Mersey River, and in Kejimkujik National Park. There are also nine sites at the mouth of the Shelburne River on private lands outside the CWA. These sites contained stone and ceramic artifacts, pits used for smoking fish, and evidence of fishing weirs. Based on these sites and what is known of historical

10 Note that a relatively small portion of the Shelburne IBP site is within the Crown land inholding at the Pollards Falls camp that is technically excluded from the CWA.

Mi'kmaq land use patterns, it reasonable to assume that the Shelburne River holds strong Mi'kmaq heritage values (S. Powell, Pers. Comm., 2008).

The Shelburne River has also been a significant route for wilderness recreation through time. Canoeing the river as part of a loop trip, which includes waterways now part of Kejimkujik Natiional Park, was first popularized by the 1908 book, *The Tent Dwellers.* The area continues to support this tradition of angling and canoe-tripping. This historic and current use of the CWA for wilderness recreation demonstrates considerable cultural values.

The designation of Shelburne River CWA will protect key sections of this valued river corridor. The provisions of the *Wilderness Areas Protection Act* help ensure that culturally-valued wilderness recreation opportunities continue to be available, and that archeologically and historically significant sites are protected.

5.2.3.2 Existence

All of the above-mentioned organizations and associations that use the CWA are concerned with the preservation and conservation of the area for its intrinsic value, and so that it may be used and enjoyed by future generations. Specifically, the Queens County Fish and Game Association supports the WA designation as their goal is conservation for future use and they acknowledge that the area cannot be replaced (D. Dagley, Pers. Comm., 2008). The South Shore Naturalists want the area protected (J. Smits, Pers. Comm., 2008). Trout Nova Scotia wants to preserve trout populations in the area for future generations (G. Taylor, Pers. Comm., 2008). CPAWS would like to see the biodiversity conserved in the CWA and places particular value on the Shelburne River, recreational potential, wilderness aspects, and conservation potential (C. Miller, Pers. Comm., 2008).

The existence values associated with the Shelburne River CWA are generally as described in Section 2.3.2. The available information does not permit further quantification or description of these values. However, designation of the CWA will help ensure the protection and conservation of the existence values into the future.

5.2.4 Ecosystem service values

5.2.4.1 Climate Change Mitigation

The Shelburne River CWA contains approximately 1,582 ha of working forest area. Using the damage cost avoidance estimate for the global value of carbon sequestration, protection has a present value of approximately $7.7 to $15.4 million over the managed forest option.[11] Using the carbon credit market value estimate, protection has a present value of approximately $0.4 to $0.7 million over the managed forest option (Section 2.4.1).[12] Again, because of commitments under the 1996 Shelburne Heritage River Management Plan for modified harvesting and setbacks along Shelburne River, this carbon

[11] Calculated as damage avoidance value of ($325/tC)(15-30tC/ha)(1582ha).

[12] Calculated as carbon market value of ($15/tC)(15-30tC/ha)(1582ha).

sequestration value is expected to be an overestimate (on average) because the actual working forest area is less than stated.

Designation of this CWA is predicted to increase climate change mitigation values. The protection of forests helps ensure continued and increased carbon sequestration in the area.

5.2.4.2 Water Regulation

The CWA contains more than 1,500 ha of forested lands, as well as lakes, wetlands, and the Shelburne River. The river connects Kejimkujik National Park to Tobeatic Wilderness Area, and provides crucial drainage to the region. The forested areas and wetlands help to control erosion, maintain water quality, and regulate water flows. This contributes to the protection of water quality and water supply in downstream lakes and waterways.

With the designation of the CWA, water regulation values are predicted to be conserved and maintained. Protection of the watershed will allow it to continue to function as needed, providing necessary water, drainage, and wildlife habitats in the area.

5.2.4.3 Biodiversity Maintenance

The CWA will help protect the Shelburne Canadian Heritage River, recognized for its natural and cultural value. As previously stated, the CWA includes four of Nova Scotia's Natural Landscapes:

- South Mountain Rolling Plain;
- Shelburne River Plain;
- Lake Rossignol Hills; and
- Sable River Basin (NSE 2008b).

Although these four Natural Landscapes are represented in existing protected areas, the Shelburne River CWA includes softwood forest drumlin, an ecosystem not currently found in protected areas of the province. Four significant ecosites have been identified in the CWA: lake island, fen-bog complex, hemlock forest, and red oak forest (NSE 2008b).

Significant forests include red maple and older, conifer-dominated stands. Among those is one of the foremost old-growth eastern hemlock stands in the region, which has been recognized as an International Biological Program (IBP) site since 1974. Most of the 79 hectare IBP site is on lands formerly owned by BowaterAbitibi, and now part of the CWA. The remaining Crown portion remains outside the CWA.

Rare and uncommon species observed in the CWA include many coastal plain plants, such as buttonbush, yellow-eyed grass, swamp rose, and skunk cabbage. Torrey's sphagnum, and three species of ordonates (dragonflies and damselflies) have also been recorded in the CWA (NSE 2008b).

The Queens County Fish and Game Association have reported mainland moose and pine marten in the CWA (D. Dagley, Pers. Comm., 2008). NSDNR has identified the rare plants *Woodwardia areolata* and *Cephalanthus occidentalis* along the Shelburne River and *Decodon verticillatus* at a lake in the area (L. Benjamin, Pers. Comm., 2008). All of these rare plants have a provincial species at risk status of yellow.

The CWA is considered to have high wildlife and habitat conservation value and is a viable movement corridor for moose populations in the Tobeatic and Dunraven areas. Shelburne River is Nova Scotia's largest, pristine wilderness river (NSE 2008a).

With the designation of the CWA, biodiversity values are predicted to be conserved and maintained. Designation helps ensure the continued protection for all flora and fauna within the CWA.

5.3 Estimated Changes with Designation

Table 5.2 presents a summary of the potential changes to current values with designation of the Shelburne River CWA.

TABLE 5.2 Summary of Socioeconomic Values: Shelburne River

Value	Current Situation	With Designation	Without Designation
Forestry	▪ 70% of the area is harvestable.	▪ Maintain or increase forest diversity and age. ▪ Estimated wood supply loss of ~3,200 m^3/year, or less if harvesting setbacks committed to in 1996 Heritage River Management Plan are considered. ▪ Loss of stumpage value of as much as $3.9 million.	▪ Area remains available for forest harvesting ▪ Stumpage value may be realized.
Mining	▪ No current mineral exploration projects.	▪ Loss of future exploration and potential mining development.	▪ Potential for future exploration and development, including metallic and industrial minerals.
Tourism	▪ Guide trips along the Shelburne River. ▪ Celebrations planned for the centennial of *The Tent Dwellers*.	▪ Potential increase in tourism with increased awareness and promotion.	▪ No anticipated impact short-term. ▪ Potential decrease in tourism if area becomes impacted by competing resource users or development.
Research and Education	▪ Used for ongoing research and education by several organizations and universities.	▪ Increased opportunities for research and education. ▪ Attract researchers to the area.	▪ Less opportunity for research and education as competing resource use and development occurs.
Vehicle and Bicycle Use	▪ No off-highway vehicle use allowed by former private land owner, although some unauthorized ATV use in CWA. ▪ ATV use over bridges and on excluded roads. ▪ Limited amount of bicycling within the CWA.	▪ 3 roads excluded ▪ Off-highway vehicle use not permitted within WA.	▪ Current, limited off-highway vehicle use may continue, but additional vehicle use unlikely as adjacent land owners restrict access.
Fishing, Hunting and Trapping	▪ Hunting, angling, and trapping occur in area. ▪ Trout population in peril due to high acidity levels and human	▪ Fishing, hunting and trapping generally permitted within WA.	▪ Current use patterns continue, although potential for further decline of trout populations without

TABLE 5.2 Summary of Socioeconomic Values: Shelburne River

Value	Current Situation	With Designation	Without Designation
	impacts.		protection.
Wilderness Recreation	▪ Existing extensive wilderness recreation use, principally including canoeing, kayaking and camping.	▪ Protects existing uses and allows for new opportunities for increased use.	▪ Likely decline in use over time as competing resource use and development occurs.
Cultural Heritage	▪ Place of special value for local residents. ▪ Heritage River designation. ▪ *Tent Dwellers* book popularized the Shelburne River. ▪ Regional river travel route used for 400+ years. ▪ Historic Mi'kmaq and European canoe route. ▪ History of hunting, fishing, trapping and logging. ▪ Significant historical and archaeological sites (Mi'kmaq and European) in surrounding area.	▪ Helps protect wilderness recreation heritage. ▪ Protects and enhances the Heritage River and surrounding area. ▪ Potential historic and archeological sites better protected.	▪ The river corridor currently has some protection as a Heritage River. ▪ Risk that the cultural heritage of this area will be negatively impacted as land use and development occurs ▪ Potential damage to yet undiscovered sensitive archeological and historical sites.
Existence	▪ High biodiversity value. ▪ Desire to maintain wildlife for use and enjoyment of future generations.	▪ Conservation of existing ecosystem and related flora and fauna.	▪ Expected loss of biodiversity as competing resource use and development occurs.
Climate Change Mitigation	▪ Existing carbon sequestering function of forest.	▪ With the damage cost avoidance estimate, protection has a present value of ~ $7.7 to $15.4 million. ▪ Present value of ~ $0.4 to $0.7 million using the carbon credit market value estimate.	▪ Less carbon sequestration by forest.
Water Regulation	▪ River, lakes and wetlands in the area provide important regional function.	▪ Help secure erosion control, protect water quality, and regulate downstream water flows by maintaining existing forests and plant life in the area.	▪ Less water regulation in the area as forests are harvested or the area is otherwise developed. ▪ Increased risk of poor water quality due to increased sediment from erosion.
Biodiversity Maintenance	▪ Contains one ecosystem type not currently protected in NS. ▪ Includes four significant ecosites. ▪ Old eastern hemlock, red maple, and older conifer-dominated stands. ▪ Rare/uncommon species include many coastal plain plants, Torrey's sphagnum, three species of ordonates, and mainland moose. ▪ Viable movement corridor for mainland moose.	▪ Maintain and potentially increase biodiversity in the WA. ▪ Help protect endangered and rare species.	▪ Existing biodiversity threatened as competing resource use and development occurs. ▪ Local conservation of rare and endangered species threatened.

6.0 SUMMARY

6.1 Current Values

Table 6.1 presents a summary of the socioeconomic values previously described in this report (Sections 3, 4 and 5).

TABLE 6.1 Summary of Socioeconomic Values

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Forestry Values	▪ 65% of the area is harvestable.	▪ 68% of the area is harvestable. ▪ Includes significant areas of older forest.	▪ 70% of the area is harvestable.
Mining Values	▪ No current mineral exploration projects.	▪ Less than1,000 ha deemed to be “hot spots” for mineral potential. ▪ Current exploration activities by mineral license owners.	▪ No current mineral exploration projects.
Tourism Values	▪ No known current tourism use. ▪ Close proximity to urban core allows tourist access.	▪ Modest amount of existing tourism use. ▪ Includes hiking on managed hiking trail system; and guide company that operates in the area for hunting and photography.	▪ Guide trips along the Shelburne River. ▪ Celebrations planned for the centennial of *The Tent Dwellers*.
Research and Education Values	▪ Used by groups for research and educational purposes.	▪ Some use for research and education.	▪ Used for ongoing research and education by several organizations and universities.
Vehicle and Bicycle Use	▪ Very limited ATV use in the area (including known illegal watercourse crossing). ▪ Some unauthorized creation of mountain bike trails and associated use.	▪ Extensive off-highway vehicle use in and around the CWA, including a regional trail network.	▪ No off-highway vehicle use allowed by former private land owner, although some unauthorized ATV use in CWA. ▪ ATV use over bridges and on excluded roads. ▪ Limited amount of bicycling within the CWA.
Fishing, Hunting and Trapping	▪ Trout fishing, and possibly some hunting and trapping.	▪ Popular area for anglers. ▪ Commercial eel licensed fisherman in the area. ▪ Hunting and trapping occurs in area (unknown levels).	▪ Hunting, angling, and trapping occur in area. ▪ Trout population in peril due to high acidity levels and human impacts.
Wilderness Recreation	▪ Existing, informal wilderness recreation use.	▪ Existing extensive wilderness recreation use, including canoeing, kayaking, hiking, camping, picnicking and snowshoeing. ▪ 15 camp leases.	▪ Existing extensive wilderness recreation use, principally including canoeing, kayaking and camping.

TABLE 6.1 Summary of Socioeconomic Values

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Cultural Heritage	▪ Place of special value for residents. ▪ History of fishing and canoeing, logging, quarrying and damming. ▪ Potentially contains historic Mi'kmaq sites.	▪ Place of special value for local residents. ▪ History of hunting, fishing, trapping, canoeing and wilderness travel. ▪ Contains significant historical and archaeological sites (Mi'kmaq and European).	▪ Place of special value for local residents. ▪ Heritage River designation. ▪ *The Tent Dwellers* book popularized the Shelburne River. ▪ Regional river travel route used for 400+ years. ▪ Historic Mi'kmaq and European canoe route. ▪ History of hunting, fishing, trapping and logging. ▪ Significant historical and archaeological sites (Mi'kmaq and European) in surrounding area.
Existence	• Roadless area of forests, wetlands and lakes. • Habitat for flora and fauna, including rare and endangered species.	▪ Grassroots protection campaign for the area since 1999. ▪ High biodiversity value. ▪ Desire to maintain wildlife for use and enjoyment of future generations.	▪ High biodiversity value. ▪ Desire to maintain wildlife for use and enjoyment of future generations.
Climate Change Mitigation	▪ Existing carbon sequestering by forest.	▪ Existing carbon sequestering function of forest.	▪ Existing carbon sequestering function of forest.
Water Regulation	▪ Lakes and wetlands comprise 15% of the CWA.	▪ Large watershed includes lakes, rivers and wetlands. ▪ More than 50 lakes with undeveloped shoreline.	▪ River, lakes and wetlands in the area provide important regional function.
Biodiversity Maintenance	▪ Largest area without roads near Halifax's urban core ▪ Includes two ecosystem types not currently protected and seven significant ecosite types. ▪ White pine and red spruce/yellow birch dominated stands. ▪ Rare species include common nighthawk, mountain sandwort, and mainland moose.	▪ Contains seven ecosystem types not currently protected in Nova Scotia. ▪ Includes 12 significant ecosites. ▪ Red spruce dominated, white pine, and mixed hardwood/softwood forest stands. ▪ Many endangered and rare species of lichens ▪ Other rare and uncommon species include Atlantic salmon, rusty blackbird, and mainland moose.	▪ Contains one ecosystem type not currently protected in NS. ▪ Includes four significant ecosites. ▪ Old eastern hemlock, red maple, and older conifer-dominated stands. ▪ Rare/uncommon species include many coastal plain plants, Torrey's sphagnum, three species of ordonates, and mainland moose. ▪ Viable movement corridor for mainland moose.

It is also important at this point to summarize the distribution of the current benefits that are associated with these various values. Specifically, the allocation of benefits is described according to those that are enjoyed by:

1) Individuals world-wide (*i.e.,* global values);
2) The Province of Nova Scotia as a whole;
3) Counties and municipal centres (*i.e.,* the HRM, Eastern Shore region, and South Shore region); and/or
4) Local landowners and lease holders.

The distribution of the current benefits is summarized in Table 6.2.

TABLE 6.2 Summary of the Distribution of Current Benefits

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Forestry	• Regional (employment and local spending) and provincial (spending and provincial revenues).	• Corporate (forestry and pulp and paper companies), regional (employment and local spending) and provincial (spending and provincial revenues).	• Regional (employment and local spending) and provincial (spending and provincial revenues).
Mining	• None identified.	• Corporate (mining companies), regional (employment and local spending), local (individual claim holders) and provincial (spending and provincial revenues).	• None identified.
Tourism	• Halifax Regional Municipality (employment and local spending), and provincial (provincial revenues).	• Halifax Regional Municipality and the Eastern Shore region (employment and local spending), and provincial (provincial revenues).	• South Shore region (employment and local spending), and provincial (provincial revenues).
Research and Education	• Local and provincial.	• Local and provincial.	• Local and provincial.
Vehicle and Bicycle Use	• Halifax Regional Municipality (including non-market benefits and local spending).	• Halifax Regional Municipality and the Eastern Shore region (including non-market benefits and local spending).	• South Shore region (including non-market benefits and local spending).
Fishing, Hunting and Trapping	• Halifax Regional Municipality (including non-market benefits and local spending).	• Halifax Regional Municipality and the Eastern Shore region (including non-market benefits and local spending).	• South Shore region (including non-market benefits and local spending).
Wilderness Recreation	• Local and provincial.	• Local and provincial.	• Local and provincial.
Cultural Heritage	• Halifax Regional Municipality and provincial.	• Halifax Regional Municipality, the Eastern Shore region, and provincial.	• South Shore region, provincial, and national.
Existence	• Provincial (and global).	• Provincial (and global).	• Provincial (and global).
Climate Change Mitigation	• Global.	• Global.	• Global.

TABLE 6.2 Summary of the Distribution of Current Benefits

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Water Regulation	• Halifax Regional Municipality and provincial.	• Halifax Regional Municipality, the Eastern Shore region, and provincial.	• South Shore region and provincial.
Biodiversity Maintenance	• Halifax Regional Municipality, provincial (and global).	• Halifax Regional Municipality, the Eastern Shore region, provincial (and global).	• South Shore region, provincial (and global).

6.2 Estimated Changes with Designation

The previous sections of this report describe the socioeconomic values associated with the three CWAs, as well as the estimated changes with designation (see Sections 3, 4 and 5). A range of socioeconomic values (Table 6.1) was examined. In order to support decisions regarding the appropriate management of the land parcels, it is important to use this information to examine the potential trade-offs involved with designation. It should be noted that the proposed CWA boundaries were initially developed with input from key stakeholders to minimize negative impacts on competing land or resource uses. Additional changes may be made to reflect additional consultation and information.

Tables 6.3 summarizes the direct impacts on the various socioeconomic values that can be expected to occur with designation. The trade-off analysis relies on both quantitative and qualitative information. A simple framework is presented in order to help understand how the proposed boundary delineations and possible changes in permitted activities may affect socioeconomic values.

TABLE 6.3 Direct Impacts on Socioeconomic Values with Designation

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Forestry	▪ Loss of identified value (approximate net present value based on potential stumpage fees of $1.5 million)	▪ Loss of identified value (approximate net present value based on potential stumpage fees of $18.3 million).	▪ Loss of identified value (approximate net present value based on potential stumpage fees of up to $3.9 million).
Mining	▪ Loss of potential, unknown value.	▪ Loss of potential, unknown value.	▪ Loss of potential, unknown value.
Tourism	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude). ▪ Impact on Goldeneye guide company due to bear baiting restrictions .	▪ Increase in identified value (unknown magnitude).
Research and Education	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).
Vehicle and Bicycle Use	▪ Loss of identified vehicle use value (small), although bicycle use can be authorized.	▪ Loss of identified vehicle use value (small), although bicycle use can be authorized.	▪ Loss of identified vehicle use value (small), although bicycle use can be authorized.

TABLE 6.3 Direct Impacts on Socioeconomic Values with Designation

Value	Blue Mountain-Birch Cove Lakes Candidate Wilderness Area	Ship Harbour Long Lake Candidate Wilderness Area	Shelburne River Candidate Wilderness Area
Fishing, Hunting and Trapping	▪ Variable impact for hunting, trapping and fishing (dependent on species and method of hunting).	▪ Variable impact for hunting, trapping and fishing (dependent on species and method of hunting).	▪ Variable impact for hunting, trapping and fishing (dependent on species and method of hunting).
Wilderness Recreation	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).
Cultural Heritage	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).
Existence	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).
Climate Change Mitigation	▪ Increase in identified value (by present value of $0.2 to $8.5 million).	▪ Increase in identified value (by present value of $2.2 to $94 million).	▪ Increase in identified value (by present value of $0.4 to $15.4 million).
Water Regulation	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).
Biodiversity Maintenance	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).	▪ Increase in identified value (unknown magnitude).

As discussed in the Introduction, the primary purpose of WA designation is to help meet provincial environmental objectives that include maintaining ecological integrity and biodiversity, protecting representative examples of natural landscapes and ecosystems, and protecting natural features and phenomena. The secondary objectives are use-related. Activities such as wilderness recreation, nature tourism, environmental education and scientific research are encouraged. Sport fishing and traditional patterns of hunting and trapping are also generally permitted.

Designation of the Blue Mountain-Birch Cove Lakes, Ship Harbour Long Lake, and Shelburne River parcels as WAs will involve the loss of commercial forestry values and any mining values that may be associated with mineral rights not yet established (note that there will be no substantial effects on existing rights to develop mines). In addition to these prohibitions, the activities that may be considered for restriction include the use of off-highway vehicles (*i.e.,* ATVs and snowmobiles), but it is important to note that no regionally-important connector trails were identified in this study that would be affected by designation for any of the CWAs. Available information indicates that some current users may be inconvenienced, but some of these impacts are largely associated with current illegal or unauthorized use. Thus, the actual impacts on vehicle users associated with designation are predicted to be small.

With designation of the three CWAs, the values that will increase include those associated with:

- Tourism;
- Research and education;
- Wilderness recreation;
- Cultural heritage;
- Existence;
- Climate change mitigation;

- Water regulation; and
- Biodiversity maintenance.

Within the scope of this study, it is not possible to reasonably estimate in a quantitative manner the extent to which these values will increase over time. Because of the lack of available information, particularly regarding a number of different types of ecosystem service values, the total value of these benefits are likely underestimated in this report.

NSDNR is concerned that designation will increase enforcement effort because there will be more regulations regarding certain activities; NSDNR has a work plan and a memorandum of agreement for doing all the enforcement work on WAs (G. Joudrey, Pers. Comm., 2008). However, although designation will change the focus of management, it is uncertain how costs to government will change given that some former activities (*e.g.,* forest management planning and monitoring) will no longer be required within the CWA.

It must be emphasized that this analysis relies on using different qualitative and quantitative measures (monetary and non-monetary). In effect, what is presented in this report are a number of indicators of value. As such, direct comparisons between different types of values are difficult. However, the analysis is useful in contributing to well-informed decision-making regarding designation.

7.0 CLOSURE

This report has been prepared for NSE. Any uses that a third party makes of this report, or any reliance on decisions made based on it, are the responsibility of such third parties. Jacques Whitford Limited accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made, or actions taken, based on this report.

The information and conclusions contained in this report are based upon work undertaken by trained professional and technical staff in accordance with generally accepted scientific practices current at the time the work was performed. Conclusions and recommendations presented in this report should not be construed as legal advice.

The conclusions presented in this report represent the best technical judgement of Jacques Whitford Limited based on the data and information obtained from the work. If any conditions become apparent that differ significantly from our understanding of conditions as presented in this report, we request that we be notified immediately to reassess the conclusions provided herein.

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APPENDIX A

Method for Socioeconomic Analysis

A. METHOD FOR SOCIOECONOMIC ANALYSIS

The overall approach for the study was to examine a range of social and economic benefits associated with the environment, working towards the development of a full accounting. This means focusing not simply on commercial values (*e.g.,* forestry and mining), but more broadly on the values attributed to, among others, recreation, education and research (information values), ecological functions and services (*e.g.,* water quality maintenance, biodiversity maintenance), existence (value from knowing the ecological system exists in a given state or condition, although there is no actual or potential use of the environment), and bequest values (the value of a potential benefit or having the option to use the environment in the future). Specific approaches to valuation and the selection of methods were driven by the specific policy or management questions for the candidate Wilderness Area in question, the socioeconomic and environmental context of the study sites, and the types of socioeconomic values of importance.

The socioeconomic analyses were accomplished by:

1) Describing the socioeconomic baseline conditions in each of the three candidate Wilderness Areas;
2) Developing a socioeconomic trade-off analysis framework; and
3) Analyzing the socioeconomic trade-offs associated with designating each of the three candidate Wilderness Areas.

A.1 Description of Socioeconomic Baseline Conditions

The description of socioeconomic baseline conditions was based on a review of available secondary information (including literature, documents and digital databases) and interviews with key stakeholders.

A.1.1 Literature and Document Review

Based on the literature and document review, socioeconomic cost-benefit categories were reviewed and those most appropriate for use in the analysis of impacts from designation of Wilderness Areas were identified. These categories include:

- Personal use and non-use values;
- Commercial values;
- Societal values (such as education, scientific and community development values); and
- Ecosystem service values (such as support for biodiversity, carbon sequestration, and water management).

Selection of the most appropriate categories considered:

- The types and characteristics of the personal and commercial direct uses of the candidate Wilderness Areas;
- The biophysical characteristics of the environment;

- The types of indirect use and non-use values that can be anticipated based on the characteristics of the environment and the relationship of the environment to people and communities; and
- The technical characteristics of the available socioeconomic studies in the literature from which value estimates may be applied.

A.1.2 Interviews

To supplement the information provided by secondary sources, it was important to gather information on uses and other values associated with the candidate Wilderness Areas. To obtain this information, Jacques Whitford conducted interviews with relevant stakeholders. Key informants were selected based on their direct involvement in local activities, representation of a stakeholder group with a specific interest in the candidate Wilderness Areas, or their specific knowledge of the candidate Wilderness Areas. This task required the interest and co-operation of the organizations and individuals – where such co-operation was not readily forthcoming, the analyses was restricted according to the deficiencies in the available information.

For the socioeconomic baseline description of the candidate Wilderness Areas, it is desirable to provide descriptions of the characteristics of land uses (i.e., types of use, user groups and stakeholders involved, extent of use, use patterns, user perceptions and qualitative values) and to develop a specific profile for key socioeconomic value categories. Key informants were asked specific questions using a semi-structured interview guide. Questions focused on describing:

- The individuals or organizations involved in activities;
- The types of land use;
- The frequency and extent of use;
- Spatial use patterns; and
- Perceived values of the area

A.1.3 Quantifying and Qualifying Socioeconomic Values

The study accounts for a comprehensive range of social, ecological and economic values. This includes both marketed and non-marketed benefits associated with current uses, both direct and indirect (including ecosystem service values), of the candidate Wilderness Areas. Non-use values are also considered to the extent that is feasible and defendable.

The description of personal use values and commercial values describe the characteristics of user activities and user groups. These values are quantified to the extent possible, based on the available information. Monetary values are the preferred metric of choice, although other non-monetary measures are employed to provide a sufficient characterization of the socioeconomic values. For personal non-use and societal values, the baseline description is primarily qualitative. However, the feasibility of using a valuation approach to quantify monetary values, based on the available secondary information, is explored. Documentation of societal values focuses on ecosystem service values specifically including biodiversity conservation,

carbon sequestration and watershed protection. This description includes a mixture of qualitative and quantitative measures, as determined by the available secondary data. Monetary quantification is applied where feasible and defendable.

Overall, the socioeconomic analyses provide estimates as they apply to the Province of Nova Scotia as a whole. However, with the anticipated change in the management of the lands in question, attention is paid to the distribution of the costs and the benefits. In other words, the study identifies any particular groups of stakeholders or regions in the province, such as HRM and Queens County, which can expect effects from the designation of the candidate Wilderness Areas.

A.2 Development of Trade-Off Framework and Analysis

The level of analysis provides government, stakeholders, and the public with a basic understanding of the implications, positive and negative, of designating the candidate Wilderness Areas. Both quantitative and qualitative descriptions of the scale and characteristics of the values are provided. Quantitative monetary valuation relies on two different approaches: direct use of market values for commercial activities; and a benefits transfer approach for select non-market values where applicable secondary economic valuation information is available from the literature. Where quantification of socioeconomic values is not possible (i.e., due to an inability to derive reasonable, defendable estimates) qualitative descriptions are provided.

In order to provide direction for further discussions and consultation concerning designation and management of the candidate Wilderness Areas, a simple trade-off analysis framework is presented to demonstrate how boundary delineations or variations in the set of allowed activities may affect uses and socioeconomic benefits. This framework is based on a multiple accounts approach, in which a separate reporting of the predicted effects of designation on each value category is provided. A change in the management of the area will affect resource conditions and related commercial, personal and societal values. A related question of interest is that of the change in values over time that could be realized with designation. The *Wilderness Areas Protection Act* (1998, c.27, amended 2005, c.56, s.18) (the Act) serves as the guide for the trade-off analysis. That is, it focuses on the socioeconomic values that are associated with the purposes of the Act, prohibited activities, and activities that may be considered for issuance of a license under the Act.

Changes in the management policy and regulatory regime associated with the designation of a candidate Wilderness Area may result in changes to the socioeconomic values. The prohibition or exclusion of activities will result in the loss of values associated with those direct uses. Restrictions in the level of activities may also lead to a reduction in values, although, in the long-term, it is possible that values will be enhanced. Also, the exclusion or restriction of some activities may result in an increase in the values associated with other activities. For example, a reduction in the use of an area for logging or mining activities may ultimately lead to an increase in fisheries production values. In short, there are economic trade-offs and interdependencies involved in the management of uses. The distribution of the costs and benefits associated with a change in the management regime must be carefully considered.

APPENDIX B

Individuals Contacted

TABLE B.1 Individuals Contacted or Who Provided Information

Name	Affiliation
Government Interests	
Hugh Gillis	Planning & Development Officer & Acting Coordinator, Strategy Development, Department of Natural Resources (DNR)
Ian Lawyer	Regional Resource Manager, Bridgewater, DNR
Sherman Boates	Wildlife Manager, Biodiversity, DNR
Gary Westoll	Central Region Resource Manager, DNR
Mike MacDonald	Director, Geological Services Division, DNR
Dan Eidt	Director of Forest Management, Crown Lands, DNR
Leif Helmer	Protected Areas Coordinator, Western Region (Bridgewater Office), Protected Areas Branch, NSE
Oliver Maass	Protected Areas Coordinator, Central Region, Protected Areas Branch, NSE
Tim Owen	A/C & P Supervisor, Department of Fisheries and Oceans, Conservation and Protection
John MacMillan	Coldwater Fish Biologist, Nova Scotia Fisheries & Aquaculture, Inland Fisheries Division
Randy Milton	Wildlife Manager, Wetlands and Coastal Habitat Program, Wildlife Division, DNR
Gerry Joudrey	Regional Director, Western Division, DNR
Stephen Powell	Assistant Curator of Archaeology, Museum of Natural History
Jason LeBlanc	Warmwater Fish Biologist, Nova Scotia Fisheries & Aquaculture, Inland Fisheries Division
Lawrence Benjamin	Wildlife Technician, Department of Natural Resources
Harry DeLong	Superintendent, Kejimkujik National Park and National Historic Site of Canada
Jackie Jorissen	Client Services Supervisor, Kejimkujik National Park and National Historic Site of Canada
Business Interests	
Chris Lowe	Vice President, Planning & Development, Annapolis Group
Michelle Landreville	Executive Director, Mining Association of Nova Scotia
Jack Kyte	Environment and Communications Manager, Neenah Paper Ltd.
Steve Rutledge	Forestry Strategic Planning Team Leader, Neenah Paper Ltd.
Peter Oram	President, Mining Association of Nova Scotia
Jim Acker	Commercial Eel Fisherman
Wade Prest	Forestex Ltd.
Murray Prest	Prest Brothers Ltd., Musquodoboit Lumber Ltd.
Jon Porter	AbitibiBowater
Chris Lowe	Annapolis Group
Bruce Graves	Former guiding business owner
Research Interests	
Amanda Lavers	Mersey Tobeatic Research Institute
Associations & Clubs Interests	
David Dagley	Queens County Fish and Game Association
Dusan Soudek	Canoe Kayak Nova Scotia
John Moore	Commodore, Maskwa Aquatic Club
Scott Merry	South Shore Paddlers
Judith Smits	South Shore Naturalists
Michael Berrigan	Chair, Musquodoboit Trailways Association
Bob MacDonald	Halifax Northwest Trails Association
Corey Robar	Trails Coordinator, ATV Association of Nova Scotia (ATVANS)
George Taylor	Trout Nova Scotia
Barry Mitchell	Lake Charlotte ATV Association
Kim Thompson	Eastern Shore Forest Watch Association
Peter Webster	Halifax Field Naturalists
Raymond Plourde	Ecology Action Centre (EAC)
Chris Miller	Canadian Parks and Wilderness Society (CPAWS)
Sue Earle	East Coast Mountain Bike Association
Kim Thompson	Eastern Shore Forest Watch Association
Carl Purcell	President, Nova Scotia Salmon Association
Larry Shortt	Director, Nova Scotia Salmon Association
Tony Rogers	Federation of Anglers & Hunters
Tony Robinson	Canadian Association of Smallmouth Anglers