



Canadian Institute of Forestry
Newfoundland and Labrador Section

State of Forestry Education and Careers

A Newfoundland and Labrador Perspective

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Part A: State of Forestry Education and Careers

A Newfoundland and Labrador Perspective

INTRODUCTION TO THE STUDY

Quiet discussions about the state of Forestry Education in Canada, specifically in Newfoundland and Labrador, have been ongoing in the forestry community for some time now.

Sir Wilfred Grenfell College decided to suspend its two-year forestry program, which is linked with the University of New Brunswick's degree program. There has also been an apparent decline in applications to the College of the North Atlantic's forest resources technology program.

The enrolment decline was generally viewed as a temporary phenomenon, perceived to be linked to economic issues such as poor employment prospects or a general downturn in the economy. The logic followed that once the industry's general prospects improved, applications to these traditionally popular degree and diploma programs would pour in again.

But in spite of better economic news, enrolment rates still declined throughout Canada, and some programs were discontinued altogether. The enrolment situation in Newfoundland and Labrador did not improve either, but little concern was raised. After all, the forestry community still held the view there were plenty of eager young graduates available, and few - if any - jobs to fill in the foreseeable future. Industry and government, the main employers of forestry graduates in Newfoundland and Labrador, were not laying off foresters, but they were certainly not hiring any new employees. The situation was not considered critical.

But information indicates the forestry education sector of most universities and colleges was still in decline, even in provinces where the forest industry was rebounding and thus, hiring. This, coupled with demographic information indicating forest professionals were slated to retire in record numbers within the next five years, began to alarm even the most conservative pundits. Indeed, the country might be facing a skilled labor shortage in this most important of Canadian industries.

The Western Newfoundland Model Forest (WNMF) Partnership is a partner-based organization made up of industry, government and NGO partners dedicated to studying the problems and successes of Newfoundland and Labrador's forests, and focusing its collective expertise on research, dialogue and problem solving. One of its standing committees, the Knowledge and Science Transfer Committee, is mandated to bring the work of the Model Forest and all its partners to the attention of the public. It also reports back the WNMF Management Group about public concerns

regarding all aspects of forestry, particularly those affecting the social, economic and personal lives of the province's communities and their citizens.

During one of this committee's meetings, the problems facing Newfoundland and Labrador's training institutions and their forest-based programs was discussed vigorously. What started out as an animated discussion among various partners became an application to the federal government's Department of Human Resources and Skills Development (HRSD) for funding to conduct a comprehensive study of the state of forestry education and training in Newfoundland and Labrador. Recommendations based on the results of this study will hopefully help direct educational institutions, government, industry, associations of forest professionals, and the general public toward a process that will ensure a steady supply of competent, dedicated, home-grown forest professionals who will work to keep our industries, recreational activities, and wildlife fully functioning in a healthy, vigorous forest.

Special thanks to all the partners who helped build this proposal and will now implement its directions, particularly Sean Dolter of the WNMF and Carla May of the Humber Economic Development Board (HEDB) for their efforts in building our ideas into what I believe will be an important contribution to the knowledge of one of our province's most important resources.

STATEMENT OF THE PROBLEMS BEING INVESTIGATED

This project has several foci:

1. To examine the current state of forestry training in Canada and Newfoundland and Labrador through a comprehensive literature search; and correspondence and interviews with key educators, and industry and government officials.
2. To look at the evolution of forestry training from its beginnings up to current models.
3. To determine the demographics of the current labor force employed as forestry professionals in Newfoundland and Labrador, with reference to the situation in Canada and internationally.
4. To discuss the current state of forestry education and training in light of demands for new paradigms in training content.

5. Through the administration and analysis of questionnaires, interviews and personal visits, explore current attitudes of forestry professionals, students (current and graduated forestry students and high school students), guidance counselors and other school officials to try to determine if forestry as a career choice is appealing to students and if not, why.
6. To make recommendations for further research, actions and programs to address problems identified in this study.

Part B: The Forest Industry in Canada

What are we worried about? Does it really matter that there are fewer professional foresters practicing in Canada? Our forests have survived extensive use for centuries, initially as a source of domestic saw logs and firewood, and then - through at least a century – increasingly higher levels of industrial pulp and paper manufacturing and sophisticated lumber production. Obviously the levels of forest stewardship have been adequate to keep our trees growing and our industries alive. Why should we as educators, industry and government officials be concerned at all?

A few statistics about the importance of Canada's forest industry can illustrate the overwhelming importance of forests to our way of life, industrial base, and recreational and wildlife values. Newer values centering on greenhouse gases and other Kyoto-based concerns are also becoming more important to all Canadians, as are concerns about biodiversity and other science-based ecological aspects of the forest.

Canada contains about 10% of the world's forests, translating into 417.6 million hectares of forested land. Of this, 234.5 million hectares are considered "commercial forest." In 2002, forestry employed 361,400 people directly, and the sector contributed \$32.6 billion to Canada's trade surplus from \$43 billion in forest products exports. The total industry is worth almost \$74 billion to the Canadian economy (Nrcan-rncan 2003).

In addition to industrial use, our forests contribute \$11 billion to Canada's tourism industry, plus \$5 million from growing and selling Christmas trees. Eleven million liters of maple syrup are produced and sold annually and Canadians use 4.2 million metres of fuel wood every year (Canada's Forest Network 2004).

Canada's forests are not just commercially valuable - 183.1 million hectares of the country's non-commercial forest is largely wilderness. About two-thirds of Canada's 140,000 species of plants, animals and microorganisms live in our forests, and 180 tree species are indigenous to Canada (NRCan-RCan 2003).

More than 20 million people use Canadian forests for hunting, fishing, trapping, recreation, photography, and berry and mushroom picking. Forests meet the cultural and spiritual needs of Canadians, particularly our aboriginal population, and most of us use the forest for aesthetic reasons, from admiring viewsapes to using trees for shade and protection in our climatic extremes. As Canadians become increasingly concerned about the

world's environment and issues arising from greenhouse gas emissions, it is important to recognize net carbon absorption and storage of Canada's forests, as well as wood and paper products, is 77 million tonnes per year (Canadian Model Forest Network 2004).

The value of forests is no less important in Newfoundland and Labrador. Our pulp and paper industry, growing sawmill operations, outdoor tourism and outfitting businesses, and forest values inherent in our hunting, fishing, wildlife, cultural and spiritual lifestyles all contribute to an increasingly active appreciation of the multiple values of our forests, and to the need to increase levels of stewardship and pro-action.

The overall value of Newfoundland and Labrador's forest industry to our province's economy is more than \$800 million, and it directly and indirectly employs 12,000 people. This represents four per cent of the total labor force. The industry is "the social and economic backbone of over 80 communities in the province" (Government of Newfoundland and Labrador, 2003).

The combined activities of primary and secondary processing in the forest industry accounted for 11.2% of real GDP in the goods-producing sector in 2002, and 3.6% of the total GDP of the province (Government of Newfoundland and Labrador 2003). Added to these activities is the growing outfitting industry, and outdoor adventure tourism including snowmobiling and similar use of forest lands.

Tourism is a major source of income for our province and accounts for almost two per cent of total GDP. This industry creates between 7,000 and 8,000 person years of employment, which translates into about \$180 million in labor income (The Economy, 2004). Total spending from non-resident visitors alone amounted to \$289.1 million in 2001 (Tourism Strategy Review 2003). Though it is difficult to separate tourism activities directly related to activities in and around our forested areas, there is little doubt a sustained and healthy forest is very important to keeping and growing this sector of the province's economy.

Thus our forests are important to all of us whether we make our living from forestry, manufacturing, or tourism, or use the forest as a place of recreation, spirituality, or culture.

"Forests play a key role in moderating the climate, regulating water systems, preventing erosion, alleviating air pollution, and providing wildlife habitat. They also offer a multitude of recreational opportunities, and are enjoyed by Canadians and tourists from around the world" (nrcan-rncan 2003).

It is not surprising our forests - susceptible as they are to cutting, disease, fire, and general intrusion by man's desire for more land with more uses - needs solid and sustained stewardship. Environment groups, industry, government, and indeed, most thinking Canadians all agree Canada's forests are important and possess multiple values held by almost all Canadians.

The responsibility of sustained stewardship falls in a significant way to foresters, a group made up of men and women who have attained either a degree in forestry or a diploma or certificate in forest technology. This professional group is employed by industry, government, NGOs, consulting companies or other partners in the forest. Their professional skills keep the forests alive and healthy; their values help determine the directions our policy makers take to determine how our forests will be utilized. Their scientific approach to forest management determines whether or not the forested area can be sustained and the ecosystem preserved.

The next section of this study will examine the historical development of forestry as a profession, and will try to show how forestry education has grown and changed over the past years.

THE HISTORY OF FOREST PROFESSIONALS IN CANADA

Before the dawn of the twentieth century, forestry in Canada and the USA was practically a non-existent profession. Levels of knowledge about forests - the science we now take for granted - was in its infancy, and the need for sustainable management practice, replanting, or silviculture of any kind was, if thought about at all, deemed unnecessary until about the end of the nineteenth century.

Actually, mass cutting of Canada's forests began in the early part of the nineteenth century. Britain, in need of wood to reconstruct its merchant marine fleet and barred from traditional sources of material by a blockade of the Baltics, turned to Canada for a ready timber supply. This activity continued for 50 more years and eventually resulted in the disappearance of pine trees from New Brunswick (1860) and the Ottawa Valley at the end of the nineteenth century (Saskatchewan Interactive 2002).

Though Britain's demand for Canadian timber started to decrease in the middle of the 1800s, the newly developed Canadian forest products industry found new markets in the increasing housing boom in the eastern United States. New housing materials gradually replaced lumber as the primary building material, but this market was quickly replaced by a new demand - pulp and paper (ibid).

Nevertheless, the forest was considered a ready source of raw materials, almost unlimited in its supply, and no one thought too much about replacing the felled trees. They simply moved on to the next ready supply, leaving cutovers to regenerate naturally or to be converted to agricultural land. But by the 1880s, only 20 to 30 per cent of eastern Ontario remained covered in forest. Many detrimental effects were resulting from the eradication of forested land. Erosion, and reduced water quality and quantity were recognized as significant problems that required action (Extension Notes, 1997)

At about the same time in history, Canada was opening its western regions (having acquired them in 1870) and settlement had begun in earnest. Initially, prairie lands were considered too arid and unsuitable for extensive farming, but irrigation experiments proved successful. Since much of the water needed originated in the foothills and mountains, it was recognized these forested areas had to be protected, especially from fire. The western railways also required significant amounts of timber to construct ties, and large quantities of saw logs were needed to support the booming housing construction following settlement (Murphy and Stevenson, 1999). The Canadian Forest Service (CFS) was born as a direct result of this growing interest in protecting wood supply and fighting forest fires.

“These were the major catalysts that led to formation of the CFS in 1899. Their dual mandate was first to protect the forests from fire; the second to plant trees on the prairies to provide wood for settlers and ameliorate the climate” (Ibid).

The Canadian Government appointed Elihu Stewart Chief Inspector of Timber and Forestry for the Dominion Forests, and he is generally assumed to have been the driving force behind the CFS’s success in its initial years. Though the main mandate of the CFS was to ensure a ready supply of timber and to prevent destruction of forests by fire, Stewart’s leadership led to a broader understanding of the value of the forests for other than industrial values.

At almost the same time, the Canadian Forestry Association (CFA) was founded in 1900. Prominent lumber baron J.R.Booth and Elihu Stewart met with other influential Canadians from industry and government to form an organization whose prime focus was conserving the forest resource. The CFA was founded on five principals:

1. Advocate and encourage judicious methods in dealing with Canada’s forests.
2. Awaken public interest in the dangers resulting from undue destruction of timber along rivers and streams.
3. Consider and recommend improvements regarding forested public land development.

4. Promote tree planting in treeless areas, along streets and parks of villages, towns and cities.
5. Collect and disseminate information on forestry issues for the benefit of the Canadian public (History of the Canadian Forestry Association, 2004).

Along with the CFS's development and dedication to forestry science designed to preserve the strong industry base of Canada's forests, came the CFA's creation and its broader mandate, which encompassed a broader range of forest values than forest protection and management for industrial use.

Even with the growth of associations and professional bodies in Canada and an increased mandate to understand the science of forestry and to protect and promote multiple values of the forest, there was still no formalized, specific education for forestry professionals in Canada (though the Ontario Agricultural College offered some courses with a forestry content).

Elihu Stewart was a land surveyor. In 1908 he hired two prominent foresters, both graduates of the forestry degree program at Yale University. H.R. MacMillan was a Canadian from Ontario, and W.N. Millar was from Pennsylvania. Their job was to help in the massive undertaking of managing Canada's forests. Both these men left an indelible mark on the way forestry developed in Canada, particularly Millar's work to include wildlife issues into the CFS mandate.

Perhaps the most important outcome of Millar's move to Canada was his 1914-appointment to the newly created University of Toronto forestry degree program in 1907, the first forestry program in Canada: "Millar's experiences influenced a whole generation of foresters" (Murphy and Stevenson, 1999).

Forest research was still in its infancy. In 1917 the Government of Canada opened its first forest research facility, the Petawawa Forest Experiment Station. Several more such operations were eventually established, notably by the BC Forest Service in 1921 and the Ontario government's Directorate of Forest Research in 1929 (Paille, 2003).

Forest use in Newfoundland and Labrador is not dissimilar to the rest of Canada. The earliest users were settlers who cut trees for firewood, and to construct homes and vessels for the fishery. Not until after the first general election under responsible government in 1855 did the first commercial uses of Newfoundland's immense forests, particularly its pine forests, become a point of interest to politicians and businessmen. But without a

convenient and inexpensive means of transportation to access the forests, little was done to develop this resource.

Construction of the railway changed this. Started in 1881 but not fully completed until 1896, this significant event in our history opened up Newfoundland's forests and saw an almost immediate development of sawmill operations in such places as Terra Nova, Soulis Brook, Glenwood, and Botwoodville. In an article published in the *St. John's Evening Telegram* Jan. 26, 1894, and as reported in the Royal Commission on Forestry in 1955, the famous Newfoundland historian Judge Prowse wrote:

“The great lumber business, yet in its infancy, is barely a year old. With time and good management it bids fair to be one of the most important industrial resources of the Colony a full supply for all wants” (Ibid).

And so it did. From then until 1905, Newfoundland's lumber producing industry was second only to the fishery in its employment and contributions to the colony's GNP. New mills were constructed and among the most prominent were those of Lewis Miller, particularly at Millertown. Utilizing primarily pine, this operation produced lumber for export through the newly constructed depot and port at Lewisport.

But as in Canada, thoughts were turning to even greater uses of the forest resource - pulp and paper production. As early as 1897 a new company, the Newfoundland Wood Pulp Company Ltd., was incorporated. As reported in the Royal Commission Report of 1955:

“Having satisfied themselves that there was sufficient timber in the area, as well as an assured water supply, the company went ahead and built a pulp mill at Black River, Placentia Bay. The mill was power-driven and had a capacity of 20 tons per day. It continued to operate for a period of five years.”

Utilizing primarily black spruce, the mill produced excellent quality pulp and was able to market it easily. A shortage of water caused the mill to close in 1905. (Ibid)

The seed was sown and in 1905, the way was paved to create the Anglo-Newfoundland Development Company (now Abitibi Consolidated) at Grand Falls. In 1925 the Newfoundland Power and Paper Company (now Corner Brook Pulp and Paper) was established in Corner Brook. Creation of these mills and continuation of some of the prominent saw milling operations that preceded them led Newfoundland toward its first period of industrialization and full use of its forest resource. In 1910 the Newfoundland Forest Fire Patrol Committee was created, marking the first government attempt at forest management in the country of Newfoundland.

Unlike Canada, Newfoundland did not create much formal structure to educate and train forestry professionals. When it became a province of Canada in 1949, institutions like the CFS and the CFA established a presence in the new province. But when Memorial University was created in 1949, a forestry degree program was not to be part of the new university's degree offerings, even though in a speech to the House of Assembly at the first reading of the bill "An Act Respecting the University of Newfoundland" in 1949, then-Premier Joseph R. Smallwood said:

"We have also given some consideration, again not exhaustive or complete, but some consideration to the idea of having attached to that university a school of forestry. And we have not by any means a school of forestry. And we have not yet by any means yet abandoned an idea to which we gave considerable thought, and in which we took considerable interest, namely, the idea of attaching to that university a school of navigation and deep-sea engineering" (As quoted in a prefatory note by Edward Roberts to Baker (ed.),2000).

The province did eventually establish a College of Fisheries, Navigation, Marine Engineering and Electronics in 1964, which later became a part of Memorial University. The forestry school never became a reality. Instead, a linkage was established between Memorial University and the University of New Brunswick, as recommended by the 1955 Royal Commission that "arrangements be made between Memorial University of Newfoundland and the University of New Brunswick for the first two years course of instruction in the five-year forestry course at the UNB. to be given at Memorial University" (Royal Commission 1955).

The Royal Commission (1955) further recommended:

"The staff of the Memorial University of Newfoundland be increased by the appointment of a graduate forester to give courses of instruction supplementary to regular university curriculum as necessary to meet UNB requirements, and to serve as Director of the Forest Ranger School under terms and conditions to be arranged with the Department of Mines and Resources" (Page 9).

Their recommendations reinforced another by former University of Alberta president Robert Newton, who was charged with completing a detailed plan for the future of MUN in 1951. In his report to the Board of Regents,

Newton recommended establishing, among other programs, a pre-forestry program (MUN 2000).

By the 1961-62 academic year, 12 students were registered in the first year of this program, and seven in the second year, for a total of 19. “This was almost twice the number of students we had last year. Three of our former students graduated in forestry at the University of New Brunswick this Spring” (MUN 1962).

The linkage with UNB continued at MUN’s St. John’s campus until it was transferred to Sir Wilfred Grenfell College in the fall of 1996. This program continued for six years but then became the subject of an internal review: “... in order to determine whether there are any changes we might make that would make this program more attractive to students and that would more directly meet the needs of the province in this area of study” (SWG 2004).

Since September 2002, no new students have been admitted to the program and the results of the internal review have not yet been released. The problems with the Sir Wilfred Grenfell program will be discussed further in this study.

Development of non-degree forestry programming was also recommended by the 1955 Royal Commission and was to take the form of a Forest Ranger School:

“... to be established jointly by the Department of Mines and Resources and the Memorial University of Newfoundland to give short courses of instruction, at the sub-professional level, in forestry and allied subjects, and that, as ‘far as practicable preference be given to holders of diplomas from the school for employment on the field staffs of the Department and the new N.F.P.A.’ (Royal Commission 1955).

But not until 1963, when government embarked upon a major educational initiative to create nine new vocational schools throughout the province, did non-degree forestry programming become more formalized. Following disastrous forest fires and insect infestations in the early 1960s, it became apparent the province needed to recruit more technical personnel. The forestry community asked the Department of Education to establish “... a two-year diploma in forestry technology to be situated at the newly proposed College of Trades and Technology in St. John’s with consideration for future transfer of this program to either Grand Falls or Corner Brook” (Howell 2004). In 1966, the first students were admitted to a two-year forest technology program, delivered in St. John’s until 1984, and then transferred to Corner Brook.

Prior to its transfer, the program had graduated a total of 332 men and women, most of whom found employment in our province. Approximately 230 additional graduates have passed through the program in Corner Brook. (ibid)

THE EVOLUTION OF FORMAL FORESTRY TRAINING/EDUCATION

As previously mentioned, the first forestry degree program in Canada was established at the University of Toronto in 1907. Its goal was to assure a good supply of well-educated professional foresters to help deal with the growing issues inherent in declining forests and inclining industry needs for a guaranteed supply of readily available fiber. Forests were considered a source of raw material for sawmills and pulp and paper producers who were fighting disease, fire and diminishing forests, while seeing an increased demand for their products. Foresters were hired primarily by industry with a mandate to ensure quality fiber to feed hungry mills and plants. The U of T program was the outgrowth of a request by the CFA when, in 1904, it asked the Government of Ontario "... to support the establishment of a School of Forestry" (Nordin and Comeau, 2003).

"...in 1907, the first Faculty of Forestry was established at the University of Toronto, with Dr. E.B. Fernow as Dean. Unquestionably, Dr. Fernow was the most influential individual of that time to stimulate forest practice and professional forestry education in Canada and the United States" (Ibid).

The University of New Brunswick enrolled its first forestry students a year after Toronto (1908), followed quickly by Laval University in 1912. As forest resources in the western part of Canada developed, so did forestry schools, with the University of British Columbia opening its first forestry classes in 1921. Alberta accepted its first forestry students at the University of Alberta in 1970. Lakehead University, the second Ontario university to offer a forestry degree, did so in 1971, followed by the Université de Moncton in 1985, and finally, another British Columbia program at the University of Northern British Columbia in 1993.

The University of Toronto is generally credited with offering the first technical level program in Canada with its two-term "Short Course in Forestry" in 1918. The first such technology program in Atlantic Canada was at the Maritime Forest Ranger School in 1946. In Newfoundland and Labrador, the then-College of Trades and Technology in St. John's, offered the first technology program in 1966.

There are now approximately 23 college programs throughout Canada offering variations on the forestry technology theme, graduating more than 500 students annually.

In the mid-1990s, faced with diminishing enrolments, the University of Toronto curtailed its undergraduate forestry degree program. Most other universities and colleges are facing enrolment declines and are fighting to keep their programs in light of tightening post-secondary budgets. Total university enrolment in 1995-95 was about 1,900, and this increased to about 2,500 by 1998-99. Estimates show only about 1,500 students were enrolled for 2003-04 (Lee 2004). Some forestry schools fear losing their autonomy by being absorbed into other university departments (for example, the University of British Columbia), while others have embarked upon massive recruitment campaigns to try to curb the decline. The University of New Brunswick has invested thousands of recruitment dollars only to find its enrolment decline continued into the September 2004 classes (Spitzhoven 2004).

Enrolment in diploma programs in Canada has dropped significantly as well. In BC alone, the number of graduates has decreased from 438 in 1998 to only 90 in 2003 (Lee 2004).

In a comprehensive series of articles in the *Forestry Chronicle*, the publication of the Canadian Institute of Forestry (Forestry Chronicle 2003), several leading foresters and forester educators speculated on the reasons for the decline in forestry enrolments at both the degree and diploma levels. In his article for this edition, Richard Macnaughton, then-CIF/IFC president, wrote:

“We are entering a crossroads in forest education in Canada. The problem is in the declining enrolment in forestry programs at colleges and universities. This is becoming a major issue within the forestry community, and is going to require the attention and resources of the entire forest sector” (Macnaughton 2003).

He speculated about the reasons for the decline and found concerns range from perceived lack of job opportunities and better opportunities in high-tech industries to a view that forestry is still an environmentally unsound science, thus making it unappealing to young Canadians. This situation is even more serious when coupled with the fact: “With up to half of the present forest practitioners retiring in the next few years, there will be a serious lack of graduates to fill these vacancies in the future if nothing is done to reverse the trend” (Macnaughton 2003).

Several other writers have offered their opinions on why there is such a sharp decline in enrolment. Shaw, (2003), writing in the *Vancouver Sun*, quotes professor George Hoberg, head of UBC’s forest resources

management program as saying “we have experienced a decline in enrolment and I don’t think that’s surprising considering how much bad news there is about the forest sector But the employment prospects for professionals continue to be quite strong.”

The BC Minister of Forests (De Jong, 2004) speculated vast publicity of the problems in that province’s forest products industry was keeping students from enrolling in forestry programs at UBC, while Don Podlubny (Podlubny 2002) blamed the decline on how the public views the industry. He cited a recent lecture at the University of Alberta by Jack Ward Thomas, past chief forester of the United States, who made the observation: “... 15 to 20 years ago surveys ranked forest practitioners in the top three of the most trusted professions. Today’s surveys place forest practitioners near the bottom of the list” (Ibid).

In a set of articles published in *Forum*, the bi-monthly publication for members of the association of BC forest professionals, several writers expressed their views on the reasons for the decline in forestry enrolments in Canadian schools (Forum, 2003).

Lewis and Hawkins (2003) stated “the exclusive nature of the profession and the failure of professional associations and universities to keep up with changing times are the driving forces behind declining enrolments.” Hoberg et al (2003) felt the primary reason for the decline is “...forestry has a bad image with prospective students,” an image as an old-fashioned, low-tech industry with a poor environmental track record dominated by white males and plagued by persistently bad economic news.

Commenting on the decline in forest technology programs in BC, Yanciw (2003) wrote about his experiences in recruitment in high schools. He found most Grade 12 students don’t associate forestry with an attractive career. As most of his students are recruited from urban schools, he felt the lack of a realistic “urban” attitude about the state of forests in BC contributes to young people choosing careers outside the forest professions. He wrote:

“As the years go by, decreasing percentages of the population have direct exposure to forest practices or contact with individuals in the forest industry. This alienation fosters misconceptions that become urban myth.”

Lear (2003) blames bad press the forest industry has generated recently for the decline. “In British Columbia alone, the industry has been faced with one crisis after another. Regardless of how strong the industry may actually

be, the constant stream of negative news paints a very dark picture of this once-vibrant industry.”

He further considers the role our schools play in shaping young people’s futures and writes: “It should not surprise anyone that school career counselors, teachers and parents - including many who work in the forest industry - have been encouraging students to choose careers where the news is more positive.”

The international context of the image issue was the subject of Roper’s article when he wrote:

“One of the sector’s weaknesses is the high public profile of domestic forestry controversies. Canada has been sharply criticized for the exploitive logging practices of years past. Although domestic issues such as clear cutting are seldom relevant to international development programs, forest-related projects are subject to close scrutiny by environmental advocacy groups” (Roper 2003).

Saddler et al (2002) wondered if our forestry faculties are to blame for not marketing themselves more as promoters of cutting-edge science. “The multiple disciplines of forestry have been overlooked in setting national agendas on science and technology,” he wrote. They are worried forestry faculties are considered old fashioned, not delivering skills needed in today’s multi-valued profession.

“As graduates of a forestry program, they must now have a package encompassing a wide range of knowledge and skills - effective management and communication, consensus building and community involvement, First Nations and environmental issues, business acumen and so on” (Ibid).

On the other hand, in his 2003 article pleading for more emphasis in Canada on the forest engineering profession, Paille noted “In 2000, the trend in forestry education was definitely away from the engineering aspect of forestry and more towards the biological and environmental aspects.” He expresses his frustrations with the lack of forest engineering programming in Canada and wonders if the low profile of this important branch of the profession will lead to more problems in enrolment in the future.

Other countries are experiencing similar problems. New Zealand is facing a shortage of skilled foresters and is actively trying to change this trend. This has prompted New Zealand’s industry to offer incentives for high school graduates to adopt forestry as a career (NZ School of Forestry, 2003), and to try to portray the industry as “intellectually stimulating and greatly

needed” (Ibid). Sands (2003) noted a decline in applications to both New Zealand and Australian university forestry programs, saying such declines have both universal and country-specific reasons.

Kanowski (2003), writing about forestry education in Australasia, states the future of forestry education, particularly in Australia, might suffer from the universities’ budgetary problems and that “Experiences ... suggest that market-oriented changes to many higher education systems pose particular challenges to relatively small, specialist programs such as forestry.”

In the United Kingdom, “the number of applications for professional and technical education courses have declined ... and the nature and image of the forestry professional has changed substantially in the last decade” (Burley 2001). He goes on to postulate six major reasons for this decline:

1. Chain Saw Image - bad men with big saws cutting all living things.
2. Dumb Image - the university program of choice for the academically challenged.
3. Unemployment Perception - no jobs in a dying profession.
4. Debt Threat - increases in tuition to allow more access.
5. Dirty Boots Image - belief that forestry is not a suitable academic subject
6. Grunt Image - forestry is a male-dominated profession. (Ibid)

It is interesting to note the Oxford Forestry Institute, associated with the University of Oxford and one of the leading forester educational institutions in the UK, has “as a consequence of major changes in structure and financing within the university, been fully incorporated into the Department of Plant Sciences” (Oxford Institute of Forestry 2004).

In the United States, the decline in forestry programs has been strongly felt with the closure of several university programs and re-alignment of others to departmental status. Parsons (2003) wrote “some experts are predicting a loss of at least half of the forestry facilities in the United States.”

Salwasser at Oregon State University reported:

“...we have experienced a 25-38% decline in new students in our programs over the past five years. At present we have about 340 undergraduates and 135 graduate students enrolled in degree programs that are administered by about 70 tenure track faculty. These trends in forestry enrolments have occurred at a time when overall university enrolments at OSU have grown by more than 25% over the five-year period” (Salwasser, 2001).

In an unpublished report jointly developed by the Canadian Institute of Forestry and the Society of American Foresters (2004), the authors noted declines in US forestry programs similar to those in Canada. “While overall undergraduate university enrolment has greatly increased in the US (8.5 million in 1970 to 15.8 million today), enrolment in forestry and natural resources programs has decreased since 1983.”

South and Laband (2003) noted an 18% decline in membership of the Society of American Foresters. They also note in the USA context, there is some pressure to lower the entrance standards of professional programs to give more students access. “We ... believe that lowering standards to increase enrolments can be counter-productive.”

They also comment on the lower starting salaries in the forestry profession compared to other professions that require a similar time period to complete a degree, and give the following example to stress their point:

“For example, at one southern US school, the average starting salary for a business graduate is US\$36,000 compared to about US\$28,000 for a degree in forest management. Armed with this information, it seems likely that many students can expect a greater return on their educational dollar with degrees from other disciplines.”

The decline is evident not just in professional forestry programs. Bell and Ermis (2000) reported a major enrolment problem in the USA for programs in wood science and technology (the primary source for workers in the sawmilling industry). Studies showed among institutions offering wood science and technology programs, “the trend over the past two decades or more has been a steady decline in enrolment,” which is all the more surprising when “... the potential job market is several times greater than the current output of graduates.”

It seems forestry enrolment decline is a problem for many developed countries, potentially affecting the future of an industry that is vitally important to most countries’ GDPs, many communities’ well-being, and many workers’ livelihoods. Developing countries are also facing significant workforce issues as they develop their forest industries. Often lack of infrastructure and poor secondary educational systems, rather than lack of motivation or interest, pose problems in countries in Africa and Asia.

But in some countries, the problem reflects a changing shift from traditional forestry towards more agro-forestry and environmental conservation. In a comprehensive study of forestry education in southeast Asia, Rudebjer and Siregar (2003) noted: “Overall, this study indicates that graduation from lower levels - certificate and diploma - is decreasing while

first degree and master, and to some extent PhD, graduation is increasing.” They go on to write:

“Forestry education institutions in Southeast Asia, and in particular in Laos, suffer from insufficient teaching materials and resources. Especially needed are library resources and teaching materials/books, current publications, laboratory and equipment, transport facilities for staff and students and financial resources. These deficiencies affect negatively the quality of education.”

Burley (1994) gives an overview of the state of world-wide forestry, and paints a picture of changing world values as deforestation attract more public and environmentalist attention. He points to a lack of professional human resources in many countries as they try to re-forest and participate more in industrial uses while meeting their particular local needs. He challenges the world-wide forestry community and particularly, the universities, to produce foresters who understand the needs of developing economies and are willing to share their expertise with the world.

“As ever, universities are still the source of professional education for the managers of the world’s major renewable resource, forests. These universities themselves have a challenge to produce graduates competent to meet the challenges of a world with changing physical and institutional environments and strong public views about natural resources.”

In a similar vein, Swaziland on the African sub-continent is facing human resource issues. A report on that country’s National Forestry (2002) program states:

“Human resource development appears to be the most crucial factor in several of the forestry sectors currently recognized as economically most promising or environmentally most vulnerable ... Government, with other stakeholders, needs to establish a strategy for human resource development, with the aim that education and training programs meet the need for specific skills in various forestry sub-sectors.”

In a FAO report, Temu (2002) showed in sub-Saharan Africa, “... graduation rates of forestry technicians have dropped dramatically, especially after 1995, mainly due to low enrolment.” He further writes “professional degree programs seem to have increased, and along with that the number of graduates.”

The writer indicates the situation in Africa needs major clarification by the various governments to clearly delineate the lines of responsibility of the various professionals, modernize its forestry programs, institute more meaningful forestry initiatives, and provide more opportunities for graduates to become meaningfully employed in their profession.

“Over the past 10 years, there have been major changes on policies and attitudes towards forestry as a whole and foresters in particular All these changes have resulted in declining employment opportunities in government, reduced government investment in forestry teaching and research capital ... and subsequently declining enrolment into forestry programs.”

From the literature available, it is clear forestry around the world is in a state of flux. North America, the UK, Australia and New Zealand are seeing significant enrolment declines, and some developing economies are facing human resource issues because of lack of infrastructure, government policies or both. Generally, it may be stated the forester’s role is rapidly changing as our use of the forests evolves to embrace more values than those normally associated with industrial use.

Issues and questions in developing economies pose a challenge to foresters everywhere. The sophisticated infrastructure and professional expertise available in Canada, the USA, Europe and other developed economies has traditionally been a source of help to those countries needing and asking for assistance in developing and implementing their forestry programs. In particular, Canada has been a source of knowledge for many countries in South America, Africa and Asia. In return, these countries have been and continue to be a source of information for Canadian foresters learning more about the world’s forestry issues. They have been able to learn from “local experts” about the importance of alternative values, alternative ways of operating, and to look at situations that inevitably provide our country with a much broader perspective on how to ensure our forests thrive well into the future.

Canada’s role in developing forest management strategies in other countries has not been well promoted in Canada. For example, Canada’s Model Forest Network has been instrumental in providing expertise and resources to several countries to set up similar programs in several international sites. These activities and their successes are an important part of Canada’s mandate to provide commitment and global leadership in sustainable forest management (Model Forest Network 2004). But there has been little or no public recognition of this major international endeavor, and one can only speculate why government has been unable to get the message of this success story out. As we struggle to fill up our forestry programs, it seems logical the international role foresters and forest technicians can play should be a selling point in recruitment.

SUMMARY AND CONCLUSIONS FROM THE LITERATURE

Literature points to problems in forestry internationally, nationally and provincially. Problems in developing economies include lack of trained professionals to deal with concept of sustainable forest management, conversion of forest lands to other uses (particularly agriculture), and lack of resources to fund university and college programs for forestry training and education.

Among the more developed economies, particularly in Europe, there is high regard for the process of sustainable forest management. In many countries, the forest industry is perceived as doing at least a reasonable job of promoting a multiple-value approach to forest use. But in many of these countries, enrolment in forestry programs is declining and concern is raised about the future supply of professionals to keep the forests productive. In the United Kingdom in particular, declining enrolments have seen the suspension of forestry education programs. Of particular note is the closure of the oldest program in England, at the venerable Oxford University. Australia and New Zealand are facing similar problems.

The situation is no brighter in the United States, where programs have been discontinued and the public blames the industry and its professionals for poor environmental stewardship, decreasing forest lands, and a host of other real and imagined problems ranging from poor water quality to decreasing wildlife populations. Forestry as a profession, once seen as prestigious, is now ranked low in the professional options for young Americans.

In Canada, where we have a large forest industry and the economic output from all forest-based industries is one of major significance to the country's economy, there is also a public perception that forests are not being managed well. Industry and its professionals are perceived to be responsible for environmental problems, disease, fire, the softwood lumber dispute, and generally failing to provide good science, leadership, or sound planning to the needs of our forests. This perception appears to exist in all parts of our country from west to east, and has led many writers to believe there is a crisis in Canadian forestry that must be addressed immediately.

Literature also makes it quite apparent there is a potential crisis in forestry training in Canada. All degree-granting institutions are showing a marked decline in enrolments. This decline is sharper and longer than those experienced during previous economic downturns in industry, where they may have been expected to be short-term problems. Coupled with this

decline has been a general rationalization of university programs throughout Canada as budgets have tightened and downsizing has become a fact of life for most institutions.

Similar problems have been seen and felt among colleges offering diploma programs in forest technology. Like their university cousins, colleges feel the need to tighten their budgetary belts and look at ways to streamline their offerings. Inevitably, programs are cut. Those programs with higher-than-average costs and lower enrolments are the first on the chopping block.

Over the past few years, Canada has seen an unprecedented discontinuation of both university and college programs in forestry disciplines. In this decision-making process, it is not always the merit of the program or its relationship to the economy that will help keep a program alive in tough times. The general consensus among the writers surveyed was even with a hold on the enrolment decline, the question still has to be asked: will the majority of degree and diploma programs in Canada's universities and colleges escape downsizing and/or closure?

Little has been written about the specifics of how these issues affect Newfoundland and Labrador. We know there has been a decline in enrolment leading to the discontinuation of Memorial's pre-forestry program. The College of the North Atlantic has seen a sharp decline in enrolment in its forest resources technology program. This decline is felt in most programs offered in Atlantic Canada, particularly at the forestry faculty of the University of New Brunswick.

It is the purpose of this study to try to determine what is going on in our province with respect to forestry education, attitudes about forestry issues, and to pose some solutions that might help address the need of our industries, government and the general public for a sound, well-managed forest to meet most, if not all, of the multiple values inherent in our use of our resource.

In summary, the most pressing problems facing the forest industry in Canada today are generally agreed to be the decline in forestry education in most provinces, and the potential problems a shortage of professional foresters and technicians might have on the future of our forests, the industries that depend on them, and the citizens who make their living from the forests, be they loggers, mill workers or tourist operators.

The following conclusions come from the literature search. Particularly highlighted are issues about the state of forestry education and training in Canada:

- 1) The profession of forestry throughout the world is in a state of flux. In developing economies, there is a severe shortage of trained

professionals to help nations use their forests for direct economic benefits, and to stop erosion of forest resources to other purposes, such as agricultural use. Professional training opportunities are limited, and better cooperation between developed and emerging economies is seen as one part of the solution.

- 2) In the more established economies of Europe, the economics of good forest management are broadly accepted and the forest industry is seen as a major benefit. There is nevertheless a significant decline in enrolments in many European forestry programs, notably in the UK, where declining enrolments have resulted in suspension of well-established programs, such as one at Oxford University.
- 3) The USA is facing a major decline in enrolments at its forestry schools, and this has also led to several prominent programs being suspended and several others being reduced in scope. The image of the forest industry and its professions is generally perceived as poor, with environmental issues and poor professional practices being the main complaint.
- 4) In Canada there has been a significant decline in enrolments in most university and college programs in every province except Quebec. Several programs have been suspended, notably the University of Toronto's undergraduate program.
- 5) The poor image the forest industry has among Canadians is a result of several factors, namely poor economic indicators arising from such problems as the soft wood lumber dispute; massive damage from insects and fires, particularly in BC; and a perceived lack of environmental concern, particularly by the forest industry.
- 6) There is a perception forestry education has not caught up with the times, uses old or non-existent technology, is dominated by white males, only attracts those who can't get into other programs, isn't academically challenging, and generally has little or no relevance to the "real" world of work as defined by the "new economy."
- 7) In a similar vein, there is a perception forestry programs - though technologically sound - don't offer the courses necessary for the modern forestry professional to do their work, and this is a direct result of the accreditation program, which values harvesting, growing and protecting trees above more socially and ecologically based duties.

- 8) Generally, most high school students are best defined as urban dwellers that don't have much of a perception of work in the forest and neither know about nor appreciate the value of Canada's forests, nor the opportunities available for meaningful work in this field.
- 9) Parents, teachers, guidance counselors, and others who help students choose their careers have a poor perception of the state of Canada's forests and forest industries, and actively discourage the choice of forestry as a career.
- 10) Many students who traditionally would have chosen forestry as a career are now choosing so-called "environmentally responsible" careers in such areas as environmental science, and fish and wildlife management.
- 11) There is still a perception that forestry is not for women, even though in reality more and more women (but still less than the proportion attending post-secondary education generally) are choosing forestry degree and diploma programs. It is still considered a "man's" profession and this stigma discourages women from applying.
- 12) Industry, government and professional forestry associations have not done enough to promote their activities as being environmentally sound, and have not persuaded the general public that sustainable forest management and ecologically sensitive practices have a very high priority in harvesting decision-making. Environmental groups have done a better job portraying much forestry practice as being irresponsible.
- 13) Government generally has been unsuccessful in getting out the message that the health and good stewardship of Canada's forests are crucial to our economic well-being. It has also been unsuccessful in promoting Canada's significant role in international forestry development.
- 14) It is not clear in Newfoundland and Labrador of the reasons for the decline in enrolment at both the degree and diploma programs available to our students, as little information is available to point us in any particular direction. Perhaps it can be assumed the reasons are parallel to those in other areas of Canada. There may be other causes, such as the general perception our own government has undervalued our forest industry, particularly in light of the apparent higher priority given to issues surrounding off-shore oil and gas.
- 15) Students might be choosing environmental science over forestry degree programs simply because these courses are offered in full in

Newfoundland and Labrador, while pursuit of a forestry degree requires relocation to UNB at the closest. The UNB degree is also a five-year program and perhaps this is perceived as a further barrier when most other programs are four years to the awarding of the baccalaureate.

Part C: A New Training Paradigm in Forestry Education

It is ironic that general perception of the professional forester is still based on forest practices designed solely for the benefit of industrial users with little regard for other non-industrial values. The reality is, Canadian universities and colleges have been restructuring their curricula offerings to reflect the multiple values of the modern forest and the new skills foresters need to meet the challenges inherent in multiple-value forestry.

For example, most degree programs now include courses dealing with such diverse topics as forest-based ethical decision-making, First Nations values, business skills, communications and writing skills, media, information technology, and many other skills and tools needed to deal with the multiple uses of our forests. While not losing sight of the practical skills necessary to do the general work of forest management, this new breed of forester is now equipped to meet such diverse challenges as preserving viewscapes, accommodating adventure tourism and Native Canadian values, preserving “special places,” and so on.

Also, teaching advanced technology including GIS and other complex computer-based tools is an absolute requirement in all forestry programs in Canada, as is instruction in environmental protection theory and practice. As more values are added to the list, the fear is there is not enough time in either a four-year degree or a two-year diploma to teach everything now considered necessary in forestry education.

The current calendar of the University of New Brunswick forestry degree program lists several minor areas of study that provide students with a significantly broader background in “non-traditional” forestry studies. The program offers minors in computer applications, parks and wilderness, and wildlife, as well as more traditional minors in wood products and forest science. Options are also offered to participate in an eight- to 16-month internship program that can provide students with a significant work experience.

All students have the option to enroll in such courses as Bioethics in Forestry, Social Values in Forest Management, Problem Solving and Interpersonal Communication, International Forest Studies, and several other similar “non-traditional” course offerings (UNB Calendar 2004).

The dilemma facing many UNB forestry students and the university itself is not the challenge of meeting new training paradigms, but how to fit all the courses and topics deemed appropriate for a modern forester into a regular

degree program, while maintaining core subject matter required by employers - traditional practical science and management tools needed for basic forest management.

UNB is the only Canadian forestry school to require five years to complete the undergraduate degree. All other schools try to fit both sides of the training continuum into four years. The five-year requirement might be seen as a problem in attracting students to UNB when they are able to obtain the same level of recognition from all other forestry schools in a four-year timeline.

Changes in forest technology programs reflect the changing paradigm. For example, the Maritime College of Forest Technology offers courses in wildlife science, public speaking, entrepreneurship, ethics and environmental issues, urban forestry and non-timber forest products, in addition to more traditional core subjects (MCFT Calendar 2004). In Newfoundland and Labrador, the College of the North Atlantic's forest resources technology program requires courses in natural resource policy and law, law enforcement, wildlife management, and environmental citizenship (CNA Calendar 2004).

Similar changes have been made to most, if not all, university and college programs over the past five years in response to most potential employers' demands for a well-rounded graduate capable of performing a wide range of duties inherent in the contemporary work place.

Foresters and forest technicians are not being educated just to work in industry. Graduates can find positions with government, environmental groups, municipalities, consulting organizations, and as researchers in various organizations such as Natural Resources Canada, universities and other institutions performing basic scientific research on forest issues. The relatively new field of urban forestry is attracting graduates charged with preserving and enhancing the flora and fauna present in cities and towns throughout Canada.

It has been argued there is still a long path of change ahead for our forestry programs. An article by Lewis and Hawkins in the *Forum* (2003) blames professional associations, universities and the Canadian Forestry Accreditation Board (CFAB) for being "stuck in time" and not responding quickly enough, nor with enough energy, to the changing requirements of the world of forestry. They blame a "closed shop."

“Professional associations need to open their doors to professionals who know about forest management as it relates to wildlife, fisheries and First Nations approaches to resource management, even if they do not know as much about harvest scheduling or silviculture. We have gone overboard in self limitation and exclusive membership.”

There is no question that Canada’s universities and colleges provide a solid education to forestry students. They are trying to meet new challenges facing the profession and adapt to demands on time and resources as they arise. These institutions have responded, though some critics would say not quickly or radically enough. For whatever reason, this new paradigm in education and training has not attracted the attention of potential students.

ENROLMENT IN CANADIAN FORESTRY PROGRAMS

In the preceding section, several writers noted a significant decline in enrolment in Canadian university and college forestry programs. This section delves into the most current information available to help paint a picture of the seriousness of this decline, and the potential for labor shortages in the future.

In a comprehensive study by the Canadian Model Forest Network for the Canadian Council of Forest Ministers, Deputies Committee (2004),* figures are presented confirming the significant decline in graduation in Canada’s seven accredited forestry degree-conferring universities. These figures show a total enrolment decline of 34% (from 2494 to 1648) between 1998 and 2002. Significantly the decline in graduation rates has gone from a high of 394 in 2000 to 293 in 2003 - a 26% decline in just four years.

Using data extrapolated from Statistics Canada forestry professional population estimates, this report also shows “forestry schools will need to produce close to 200 graduates per year over the short term just to replace retiring professionals, not including those in management.” Beyond 2008, “this number could increase by as much as 150%, or 300 graduates per year based on replacing retirements alone” (ibid).

The normal need for new foresters increases at a minimum of three per cent per year (or 78 graduates). If this is added to the numbers required to replace retirements (300 graduates), and if we account for new initiatives, international secondments, promotion into management, change of profession, and a desire to move into research positions in government and industry, the situation becomes immediately crucial given the reality it requires a minimum of four years to educate a professional forester.

The study also investigated the situation of the forest technology programming in Canada and found similar results, though complete data was not available because there appears to be no national compilation of graduation numbers of technicians. Some individual institution statistics were available and they show, for example, a 62% decline in numbers graduating from Sault College of Applied Arts and Technology over a five-year period. In Atlantic Canada, the Maritime College of Forest Technology in Fredericton “also had a declining enrolment concern and undertook program modifications and implemented a marketing program, resulting in a positive response” (ibid).

The College of the North Atlantic’s forest resources technology program has shown a significant decline over the past five years. In 1999 there were 37 first-year students enrolled in the two-year program. In September 2004, the college registered 16 new students, a decline of 57% (Howell 2004).

The study concludes “colleges will need to produce about 160 forestry technician graduates per year over the short term, and well over 300 per year in the long term” (ibid), just to maintain existing numbers. And as with degree foresters, the figures do not account for other factors such as movement to management positions, change of profession, or work in research.

EMPLOYMENT PROSPECTS FOR FOREST PROFESSIONALS

Having shown there is a significant decline in forest program enrolment; this section will attempt to describe the most up-to-date labor market situation for forest professionals in Canada today. The issues of enrolment and employment are linked in that one can affect the other, particularly in the choices students make about their futures.

One of the reasons given for the national enrolment decline in forestry programs is the belief enrolment is directly proportional to employment prospects. Several writers have indicated this is the reason behind other enrolment declines faced by Canadian universities and colleges. In the past, as employment prospects increased, so did forestry enrolment. This appears not to be the case in this current situation.

Generally speaking, employment for foresters and technicians is strong. Dean David MacLean, writing for UNB’s forestry newsletter *Inside the Bark*, stated in spite of UNB’s drop in enrolment, several strong selling points for its forestry programs include “...strong employment prospects

(near full employment up until last year), and even with the slow forestry economy, many job opportunities, with new sectors seeking our graduates” (MacLean 2002).

In another article a year later, Dean MacLean wrote: “It seems that the only news the media ever carries about the forest sector is bad news. This is not a true reflection of the importance and health of the sector, which is here to stay as a key Canadian industry. UNB graduates are generally doing well in securing employment” (MacLean 2003).

He further states his case by using information from Human Resources Development Canada showing graduates from forestry programs are more likely to be employed than graduates from programs of equivalent duration and level.

“Salaries are 24% higher than the average of all university graduates and 34% more than graduates of similar types of programs” (www.jobfutures.ca).

Information from British Columbia shows 96% of all forestry professionals were employed full time and average earnings were almost twice the average - \$49,000 compared to \$28,000 (www.workfutures.bc.ca).

Information published in Human Resources and Skills Development Canada’s National Occupational Classification System (NOC, 2001) indicates the employment potential for forestry professionals (NOC Code 2122) is good. In writing about employment trends, it says:

“Forestry professionals make up a very small group within Newfoundland and Labrador. According to the 1996 census, 40 persons were employed as forestry professionals in the province. This remained unchanged from the number of persons employed in this occupation in 1991. Over the same period, employment in all occupations fell by five per cent.”

The same report states generally, employment outlook is only “fair,” but there will be employment in the short term for reasons such as retirement. Generally, forest professionals earn a good salary, with an experienced forester making at least more than \$30 per hour.

The employment potential is also good for forestry technologists and technicians (NOC 2223). According to the 1996 census, the labor force for this occupation in Newfoundland and Labrador consisted of 215 persons. Employment in this occupation is often seasonal and when the census was taken (June 1996), the reported unemployment rate was 23% - higher than the provincial average for all occupations of 20% - though it is likely “more people did find work at other times throughout the year.”

The labor market report further states the outlook is only “fair” for this occupational category, and between 1998 and 2003, “little change in the level of employment is expected.” If the statistics and commentary HRDC provides are to be believed, the prospects for both degree and diploma graduates in finding employment in Newfoundland is fair to good. However, it should be understood the statistics provided are based on information that is, at best, four years old (the information itself was published in 2001) and on census data collected in 1996.

This is the only data available to guidance counselors and others helping students choose their programs of study. It seems reasonable to assume some decisions have been made based upon the facts as presented.

In summary, in 1996 there were 40 professional foresters and 215 forest technicians employed in our province. From information collected from the two pulp and paper companies, government, and an incomplete survey of saw-milling operations and woodlands contractors, in 2004 the employment statistics were as follows:

Table 1: 2004 Employment Statistics

| Organization | Graduate Foresters | Graduate Technicians |
|--|---------------------------|-----------------------------|
| Pulp and paper industry | 19 | 60 |
| Provincial government (excluding management) | 12 | 260 |
| Others including non-paper producers, consultants, education/training, harvesters (best guess) | 3 | 13 |
| TOTAL | 34 | 333 |

NOTE: Within industry there are 11 foresters/technicians over age 50 and 30 between age 35 and 49. Only 11 are younger than 35 years. Age statistics were not available from government.

Bruce Pike of NRCAN/CFS wrote in personal correspondence the primary need at the Corner Brook headquarters is for research scientists, most requiring a doctorate. Their qualifications may vary depending on the project, but specific forestry degrees are not usually requested. Technical staff who support the work are also mostly science graduates, though “the minimum educational requirement can be a forest technical school graduate.” However, when hiring for technical positions, graduates with a

forest science degree would likely do better in an interview than one with, for example, a forest management background. Pike also wrote:

“Our organization (i.e. CFS as a whole) has targeted forestry university graduates to administer programs (e.g. Model Forest, First Nations Forestry program, other extension work). However, we don’t have anyone in that capacity within the Corner Brook office.”

Most foresters are not trained in pure science or in research methodology, so it is not surprising opportunities do not present themselves within CFS research facilities. But a professional forester wishing to work in research can enhance his or her opportunities by pursuing a higher degree and opting for forest science as the route of the first degree.

Corner Brook Pulp and Paper does have plans to hire additional staff subject to budget. In personal correspondence George VanDusen, forest management supervisor with that company, indicates four new technicians are planned to help with more intensive harvest planning.

There appears to be some reasonable opportunities for both degree and diploma graduates for the future in our province. However, it appears there is a significant pool of trained technicians who have not found employment (and are quick to point this out). But many of these graduates have found employment in alternate fields and may not wish to return to their previous career choice when the job market opens up. This is difficult to read, but there is a feeling “out there” that there are few, if any, jobs available in our province - a feeling that will have to be overcome as part of future recruitment strategies. The existence of this feeling is supported by the findings of a survey of forest resource technology students at the CNA, presented later.

Part D: The Data and Its Analysis

OVERVIEW OF THE METHODOLOGY

The following is an analysis and commentary on the data collected as part of this study.

Three specific groups were considered to be especially important in the process of finding out why there has been such a decline in enrolment at forestry-related programs in our province: current high school students, school guidance counselors, and members of the forestry profession itself.

A total of 418 questionnaires were administered to current Level Three high school students in various regions of the province, including Labrador. An attempt was made to get a fair representation of all regions of the province, both urban and rural, and to include schools situated in areas with and without a major connection to the forest industry. Questions were aimed at ascertaining high school students' opinions on a variety of forestry-related topics, and to try to determine their future career plans and how they might relate to forestry careers. An effort was made to compare students in St. John's with those in other parts of the province, and to try to discern what, if any, differences exist between students in St. John's and all others in the province.

A second questionnaire was sent to 25 randomly selected high school guidance counselors and to 25 randomly selected members of the Canadian Institute of Forestry, Newfoundland and Labrador Section. The purpose of this questionnaire was to try to determine professional attitudes towards the forest industry and to compare foresters' and counselors' responses to the same questions. The intent was again to try to discern what, if any, differences exist between the two groups.

THE HIGH SCHOOL STUDENTS' QUESTIONNAIRE

Table 2: Student Survey Participants

| KEY: | TOTAL |
|-------------------|--------------|
| Students Surveyed | 418 |
| Male | 218 |
| Female | 200 |

| | |
|------------|-----|
| St. John's | 67 |
| Other | 351 |

The following questions asked students about their attitudes towards several issues in forestry and the forest professions. They were asked to rank 13 statements from 1 (strongly disagree) to 4 (strongly agree). Results were analyzed by gender and location in the province (St. John's versus all other locations). The results were analyzed for significant difference using the Chi Square test for distribution.

Most of the following questions were linked to the conclusions reached from the literature search, where the literature showed a consensus among writers on possible reasons for the decline in forestry enrolments throughout Canada and other parts of the world as well. For example, the literature indicated students were not choosing forestry because of a belief such jobs did not pay as well as jobs requiring equivalent levels of education. Similarly, the literature indicated many students are not choosing forestry because they believe it is not an environmentally sensitive profession.

Table 3: Student Survey Question A

| A: Jobs in forestry pay better than other professional jobs requiring the same level of education. | | | | | | | | | | |
|--|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|---|-----|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 26 | 17 | 97 | 90 | 58 | 47 | 37 | 46 | 2.5 | 2.6 |
| % | 6.2 | 4.1 | 23.2 | 21.5 | 13.9 | 11.2 | 8.9 | 18.91 | All = 2.5 | |
| % students | 10.3 | | 44.7 | | 25.1 | | 19.9 | | No significant difference between M & F | |
| % Disagree/Agree | 55.0 | | | | 45.0 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | Significant difference between M & F | |
| Total | 21 | 22 | 23 | 194 | 12 | 93 | 11 | 72 | | |
| % | 31.1 | 6.2 | 34.3 | 46.7 | 17.9 | 26.5 | 16.4 | 20.5 | | |

Analysis of this question showed a majority (55%) of students believe forestry is a profession does not pay as well as other jobs requiring a similar level of education. Students in St. John's schools felt significantly more strongly about this question than students from others parts of the province, with a higher proportion (31.1%) strongly disagreeing with this statement compared to 6.2% of other students. Clearly, students in St. John's schools have a poorer image of the forester's pay scale when compared to all others. Nevertheless, all students believe the foresters' pay is below what they might get from participating in other professions.

Students generally feel the pay for professional forestry professions in less than that for jobs requiring equivalent education.

Table 4: Student Survey Question B

| B: Forestry education requires courses in science and math | | | | | | | | | | |
|--|-----------------------|--------------|-----------------------|--------------|--------------------|--------------|--------------------|--------------|---|-----|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender | | | | | | | | | | |
| Total | 30 | 41 | 61 | 47 | 78 | 72 | 49 | 40 | 2.7 | 2.5 |
| % | 7.2 | 9.8 | 14.6 | 11.2 | 18.7 | 17.2 | 11.7 | 9.6 | All = 2.6 | |
| % students | 16.9 | | 25.8 | | 35.9 | | 21.3 | | No significant difference between M & F | |
| % Disagree/Agree | 42.7 | | | | 57.2 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | The difference between St.J's and Other was significant | |
| Total | 22 | 49 | 19 | 89 | 14 | 136 | 12 | 77 | | |
| % | 32.8 | 13.9 | 28.4 | 25.4 | 20.9 | 38.7 | 17.9 | 21.9 | | |

Students' image of the academic requirements of forestry programs is somewhat skewed from its reality. Forestry and forest technology are both science- and math-oriented programs requiring academic math and some pure science as entrance requirements, and a significant amount of math and science in the programs themselves. However, the attitudes of a high minority of students (42.7%) bears out the perception found in the literature that students undervalue forestry programs for their inherent academic rigor. Analysis of this question shows a majority (61.2%) of St. John's students believe forestry programs DO NOT require much, if any, science and math, but their responses were offset by other students' (60.6%) better understanding of the science/math basis of the study of forestry.

The image of the forester in urban environments in particular is perhaps based on a stereotypical picture of the lumberjack and not that of a professional science and technology graduate.

Table 5: Student Survey Question C

| C: Forestry as a profession is concerned about environmental issues | | | | | | | | | | |
|---|-----------------------|--------------|-----------------------|--------------|--------------------|--------------|--------------------|--------------|--|-----|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender | | | | | | | | | | |
| Total | 39 | 21 | 106 | 78 | 41 | 91 | 32 | 10 | 2.7 | 2.5 |
| % | 9.3 | 5 | 25.4 | 18.7 | 9.8 | 21.8 | 7.7 | 2.4 | All = 2.6 | |
| % students | 14.3 | | 44.1 | | 31.6 | | 10.1 | | A significant difference between M & F | |
| % Disagree/Agree | 58.4 | | | | 41.7 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 13 | 47 | 34 | 150 | 14 | 118 | 6 | 36 | | |
| % | 19.4 | 13.4 | 50.7 | 42.7 | 20.9 | 33.6 | 9 | 10.3 | | |

Almost 60% of all students believe forestry is NOT concerned about the environment. This fits the literature review, which clearly stated forestry has a bad reputation among the general public as not being environmentally conscious. Clearly there are differences between male and female perceptions. More females (24.2%) agree with the statement than males

(17.5%), and their negative attitudes were not as strong, with 23.7% disagreeing with the statement as opposed to 34.7% of the male students disagreeing. The reasons for this gender difference are unclear, as the writer would have predicted a higher negative attitude for female students than for males. Nevertheless, the differences are significant and they are still generally negative about the state of forestry's environmental record. Of interest as well is the fact 70% of students in St. John's have a generally negative attitude compared to 58.4% overall.

Students clearly have a negative view of the forester's role in protecting the environment and believe forestry is not concerned with environmental issues.

Table 6: Student Survey Question D

| D: There are jobs available for foresters and forest technicians in Newfoundland and Labrador | | | | | | | | | | |
|---|-----------------------|--------------|-----------------------|--------------|--------------------|--------------|--------------------|--------------|--|-----|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender | | | | | | | | | | |
| Total | 67 | 50 | 71 | 61 | 62 | 59 | 18 | 30 | 2.1 | 2.3 |
| % | 16 | 12 | 17 | 14.6 | 14.8 | 14.1 | 4.3 | 7.2 | All = 2.2 | |
| % students | 28 | | 31.6 | | 28.9 | | 11.5 | | No significant difference between M & F | |
| % Disagree/Agree | 59.6 | | | | 40.4 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 22 | 95 | 21 | 111 | 12 | 109 | 12 | 36 | | |
| % | 32.8 | 27.1 | 31.3 | 31.6 | 17.9 | 31.1 | 17.9 | 10.3 | | |

The literature showed many Canadians believe employment prospects in the forest industry were few, in spite of data from the Department of Human Resources and Skills Development to the contrary. High school students seem to have picked up this attitude, with 59.6% of them stating they felt employment prospects for foresters and technicians in our province were poor. This negative attitude is felt generally by both male and female students and across the entire province. And of course, the situation in our province over the past few years has borne this feeling out. Employment for foresters and forest technicians has been slow in our province over the past five years, but with many retirements looming, this situation will perhaps change.

There is a strong perception there are few opportunities for employment in the forestry professions.

Table 7: Student Survey Question E

| E: I have learned about the forest industry in Newfoundland and Labrador in a school course | | | | | | | | | | |
|---|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-----|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 9 | 15 | 31 | 36 | 97 | 81 | 81 | 68 | 3.1 | 3.0 |
| % | 2.1 | 3.6 | 7.4 | 8.6 | 23.2 | 19.4 | 19.4 | 16.3 | All = 3.1 | |
| % students | 5.5 | | 16 | | 42.6 | | 35.7 | | No significant difference between M & F | |
| % Disagree/Agree | 21.5 | | | | 78.3 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 2 | 22 | 7 | 60 | 36 | 142 | 11 | 127 | | |
| % | 2.9 | 6.2 | 10.4 | 17.1 | 53.7 | 40.6 | 32.8 | 36.2 | | |

Many students - 78.3% - agreed with this statement, indicating the school curriculum is a major source of information about the forest industry in our province. Both male and female students, as well as rural and urban students, express this feeling, with no significant differences found among the groups. This information, coupled with results of the analysis of other questions, might indicate students are learning negative information about the state of the province's forests and the role of foresters who are trying to keep the forests healthy and sustainable.

It is perhaps interesting to note 21.5% of students said they learned nothing about forests in their school curriculum, though only about nine per cent strongly disagreed with this question. Thus it could be argued schools are not addressing the issues of forestry across the entire curriculum, nor are they presenting a very positive picture of the situation of our forests and the industries using them.

A major source of students' information about forest industries and professions is learned through school curricula and related activities.

Table 8: Student Survey Question F

| F: Forestry has equal opportunities for both men and women | | | | | | | | | | |
|--|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-----|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 27 | 16 | 79 | 81 | 70 | 61 | 42 | 42 | 2.6 | 2.6 |
| % | 6.5 | 3.8 | 18.9 | 19.4 | 16.7 | 14.6 | 10 | 10 | All = 2.6 | |
| % students | 10.35 | | 38.3 | | 31.3 | | 20 | | No significant difference between M & F | |
| % Disagree/Agree | 48.6 | | | | 51.3 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 7 | 36 | 27 | 133 | 20 | 111 | 13 | 71 | | |
| % | 10.4 | 10.3 | 40.3 | 37.9 | 29.9 | 31.6 | 19.4 | 20.2 | | |

The literature indicated a general attitude that forestry is often perceived as almost exclusively the domain of men, and roles for female foresters and

technicians were not as plentiful. This has been borne out by results showing almost a full 50% of our high school students see a lack of equal opportunity for women in forestry professions. Students still express the stereotype of the male-dominated profession even though many more women across the country are choosing forestry careers than ever before, and many now hold visible positions in both industry and government. That female students felt this way in the same proportion as males indicates students in our high schools have not gotten the message that forestry professions are a good place for females to work.

Students generally, and female students in particular, feel there are not equal opportunities for females in the forestry professions. The profession clearly needs to enhance its image as an equal-opportunity workplace.

Table 9: Student Survey Question G

| G: The forest industry is very economically important in our province. | | | | | | | | | | |
|--|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-----|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 10 | 12 | 51 | 38 | 107 | 96 | 50 | 54 | 2.9 | 3.1 |
| % | 2.3 | 2.9 | 12.2 | 9.1 | 25.6 | 23 | 12 | 12.9 | All = 2.9 | |
| % students | 5.2 | | 21.3 | | 48.5 | | 24.9 | | No significant difference between M & F | |
| % Disagree/Agree | 26.5 | | | | 73.4 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 2 | 20 | 11 | 78 | 34 | 169 | 20 | 84 | | |
| % | 3 | 5.7 | 16.4 | 22.2 | 50.7 | 41.1 | 29.9 | 23.4 | | |

The literature is rife with issues surrounding lack of a future for the forestry industry. Mill closures, and forest devastation caused by fire and insects have been report extensively by the media, leading many to believe the industry has been hit badly and may not recover. This perception is perhaps the cause for just over 26% of high school students in our province believing the industry is not economically important to our province. However, this opinion was shared equally by both urban and rural students, including students in Corner Brook and the Bay of Islands - many of whom benefit from mill operations in Corner Brook. It is very difficult to account for this perception given the realities of the visual nature of the mill and the number of people it employs. Perhaps it has to do more with lack of visibility of harvesting operations, or often negative press about wood shortages in the province. Perhaps most students don't associate the forest industry with the manufacturing of paper.

Whatever the interpretation, it is unsettling such a strong contributor to the province's economy should be held in such low esteem by 26% of high school students.

The economic importance of forestry industries to our province needs to be better articulated by both industry and government.

Table 10: Student Survey Question H

| H: The work can be physically demanding | | | | | | | | | | |
|---|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-------|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender Total | 6 | 4 | 71 | 46 | 101 | 57 | 40 | 93 | M=2.8 | F=3.2 |
| % | 1.4 | 1.0 | 17 | 11 | 24.2 | 13.6 | 9.6 | 22.2 | All =2.9 | |
| % students | 2.4 | | 28 | | 37.8 | | 31.8 | | A significant difference between M & F | |
| % Disagree/Agree | 30.4 | | | | 69.6 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 2 | 8 | 22 | 95 | 23 | 135 | 20 | 113 | | |
| % | 3.0 | 2.3 | 32.8 | 27.1 | 34.3 | 38.5 | 29.9 | 32.2 | | |

The literature frequently addressed the perception of forestry professions as men with axes cutting down trees. The stereotypical logger with plaid jacket, toque and axe - the Paul Bunyan type - is considered the same as the professional forester; trudging through the woods, outdoors all the time, lifting and carrying and generally performing physical work. The forester working at a computer, producing graphs and maps and dressed in normal office attire is not the general picture in students' minds.

Almost 70% of high school students think the work of the forester is physically demanding and there was a significant difference found between male and female students with the perception of physically demanding work being more prevalent among females. There was no difference found between urban and rural students.

The image of the forestry professional needs to be changed from a stereotypical lumberjack to a sophisticated, high-technology scientist.

Table 11: Student Survey Question I

| I: There are Many job opportunities in forestry as in the Information Technology (IT) industry in our province. | | | | | | | | | | |
|---|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|---|-------|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender Total | 24 | 40 | 110 | 97 | 71 | 57 | 13 | 6 | M=2.3 | F=2.1 |
| % | 5.7 | 9.6 | 26.3 | 23.3 | 17.0 | 13.6 | 3.1 | 1.4 | All =2.2 | |
| % students | 15.3 | | 49.5 | | 30.6 | | 4.5 | | No significant difference between M & F | |
| % Disagree/Agree | 64.8 | | | | 35.1 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | A significant difference between St.J's and Other | |
| Total | 2 | 62 | 27 | 180 | 33 | 95 | 5 | 14 | | |
| % | 3.0 | 17.7 | 40.3 | 51.3 | 49.3 | 27.1 | 7.5 | 4.0 | | |

Almost 65% of high school students believe there are more opportunities available to them in the IT sector than in the forestry sector. This is contrary to current national trends of downsizing in the IT sector. It is particularly interesting this perception should be so strong despite such a small IT sector in Newfoundland and Labrador.

However, significant differences were found between St. John’s students and all others, with almost 60% in St. John’s high schools believing the IT sector did NOT offer a significant job opportunity compared to the forest sector. This perhaps reflects the closer proximity of these students to the problems in the IT sector in the St. John’s area. High school students in other areas of the province do not seem to be aware that the IT sector has downsized in Canada, resulting in unemployment of IT professionals. This, and their closer proximity to the forest sector and its perceived stagnation as an employer, might account for these differences.

Future professional opportunities in forestry need to be promoted especially in light of anticipated skill shortages predicted for the near future

Table 12: Student Survey Question J

| J: Forestry has a poor image in the media | | | | | | | | | | |
|---|-----------------------|--------------|-----------------------|--------------|--------------------|--------------|--------------------|--------------|--|-------|
| | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Gender | | | | | | | | | | |
| Total | 29 | 29 | 61 | 50 | 87 | 79 | 41 | 42 | M=2.6 | F=2.7 |
| % | 6.9 | 6.9 | 14.6 | 12.0 | 20.8 | 18.9 | 9.8 | 10.0 | All =2.7 | |
| % students | 13.8 | | 26.6 | | 39.7 | | 19.8 | | No significant difference between M & F | |
| % Disagree/Agree | 40.4 | | | | 59.6 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 3 | 35 | 22 | 89 | 28 | 138 | 14 | 69 | | |
| % | 4.5 | 15.7 | 32.8 | 25.4 | 41.8 | 39.3 | 20.9 | 19.7 | | |

59.6% of students throughout the province believe the media portrays the industry poorly. This corresponds generally with the feeling among professionals that the media is no friend to the forest industry and generally, its reporting of forest-related issues puts the industry in a negative light. There was no significant difference found between males and females, nor between urban and rural students. This may account for many of the negative attitudes expressed throughout the survey. In another question in the survey, many students indicated they form their opinions about the industry from the media, particularly radio and television.

The literature shows many writers believe the media does not give the forest industry a fair view in its general reporting, and many writers believe this accounts for many of the problems in recruiting students to forestry programs through out the country. This result supports this opinion.

Significant efforts by industry, government and the forestry professions need to be made to try to ensure the media reports a more balanced picture of the successes in sustainable forest management.

Table 13: Student Survey Question K

| K: The forest industry has a strong future in our province. | | | | | | | | | | |
|---|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-------|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 22 | 32 | 117 | 101 | 68 | 51 | 11 | 16 | M=2.3 | F=2.2 |
| % | 5.3 | 7.6 | 28.0 | 24.2 | 16.3 | 12.2 | 2.6 | 3.8 | All =2.3 | |
| % students | 12.9 | | 52.2 | | 28.5 | | 6.4 | | No significant difference between M & F | |
| % Disagree/Agree | 65.1 | | | | 34.9 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 8 | 46 | 39 | 179 | 18 | 101 | 2 | 25 | | |
| % | 11.9 | 13.1 | 558.2 | 51.0 | 26.9 | 28.8 | 3.0 | 7.1 | | |

Again, the literature comments frequently on the general opinion the forest industry in Canada is no longer as strong as it once was, and is becoming less important to the well-being of most Canadians. As mentioned in an earlier statement, both national and provincial have covered such issues as fire, disease, and plant closures, and all such stories give the general impression there is trouble in the industry and it might not survive in the long term as one of the major contributors to the nation's economy.

Similar issues have been raised in this province with wood supply issues being prominently reported, always with the hint a mill might close or at least take significant downtime; or a particular paper-producing machine might be permanently closed. It's therefore not surprising 65% of our high school students believe the forest industry in our province has a poor future.

The negative economic image of forest industries needs to be addressed, highlighting the efforts industry and government have made to address such issues as wood supply, capital investment, modernization and mechanization.

Table 14: Student Survey Question L

| L: Foresters work outdoors most of the time. | | | | | | | | | | |
|--|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-------|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 9 | 11 | 51 | 41 | 110 | 97 | 48 | 51 | M=2.9 | F=2.9 |
| % | 2.1 | 2.6 | 12.2 | 9.8 | 26.3 | 23.3 | 11.5 | 12.2 | All =2.9 | |
| % students | 4.7 | | 22.0 | | 49.4 | | 23.5 | | No significant difference between M & F | |
| % Disagree/Agree | 26.7 | | | | 72.9 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 2 | 18 | 14 | 78 | 29 | 178 | 22 | 77 | | |
| % | 3.0 | 5.1 | 20.9 | 22.2 | 43.3 | 50.7 | 32.8 | 21.9 | | |

This question was asked to try to determine just what students perceive the role of the forester to be. The literature complains the image of the forester is one of the stereotypical lumberjack, spending most of his time outdoors, in all weather, deciding what trees to cut and then proceeding to cut them down.

The high-tech nature of the average forester’s job has neither been well explained nor shown, or if it has, it has not been internalized by the high school student - 72.9% of our province’s high school students believe the average forester spends most of their time outdoors performing low-tech duties. Obviously our students do not understand the highly computerized role of the average forester and forest technician.

The picture of the typical forester working outdoors with chain-saw in hand needs to be replaced by that of the typical forester in an office environment using computers and other high-technology as decision-making tools.

Table 15: Student Survey Question M

| M: I have a good understanding of forestry career opportunities in Newfoundland and Labrador | | | | | | | | | | |
|--|-----------------------|-------|-----------------------|-------|--------------------|-------|--------------------|-------|--|-------|
| Gender | Strongly Disagree (1) | | Somewhat Disagree (2) | | Somewhat Agree (3) | | Strongly Agree (4) | | Mean Score out of 4 | |
| | M | F | M | F | M | F | M | F | M | F |
| Total | 127 | 11 | 71 | 60 | 97 | 102 | 38 | 27 | M=2.7 | F=2.7 |
| % | 2.9 | 2.6 | 17.0 | 14.4 | 23.2 | 24.4 | 9.1 | 6.5 | All = 2.7 | |
| % students | 5.5 | | 31.4 | | 47.6 | | 15.6 | | No significant difference between M & F | |
| % Disagree/Agree | 36.9 | | | | 63.2 | | | | | |
| Geographic | St. J's | Other | St. J's | Other | St. J's | Other | St. J's | Other | No significant difference between St.J's and Other | |
| Total | 0 | 23 | 24 | 107 | 31 | 168 | 12 | 53 | | |
| % | 0 | 6.6 | 35.8 | 30.5 | 46.3 | 47.9 | 17.9 | 15.1 | | |

Given the reality of responses previously discussed in this section of the study, it is surprising to see 63.2% of all high school students believe they have a good understanding of career opportunities available for graduates of forestry and forest technology programs, when in most cases their opinions run contrary to those of industry, government and the professionals who work there.

It seem logical to assume most students believe they know enough about the profession to form a clear opinion about the career options, in spite of misinformation many of them have received about the professional role of the forester and technician, industry needs, available career opportunities, and the industry’s economic importance to Canada and particularly, to Newfoundland Labrador.

It is equally clear a great deal of effort has to be expended to reverse these interestingly negative results. The most important of these efforts should be

directed to the school system, its teachers, administrators and most, importantly its students.

Students hold the forestry professions in very low esteem. All parties concerned about the future of the profession need to cooperatively address students' misunderstandings through a comprehensive program using all available means, to positively promote the correct image of the industry and its professionals.

Table 16: Student Survey Question 11

| 11. Do you know anyone who works in any aspect of the forest industry? | | | | | | | | | | |
|--|---------|-----|-------|--------|-------|---------|------|-------|--------|-------|
| Stats | YES= 47 | | | | | NO= 371 | | | | |
| | M | F | Total | St.J's | Other | M | F | Total | St.J's | Other |
| # | 26 | 21 | 47 | 0 | 47 | 192 | 179 | 371 | 67 | 304 |
| % | 6.2 | 5.0 | 11.2 | 0 | 13.4 | 45.9 | 42.8 | 88.8 | 100 | 86.6 |
| A significance difference was found between St. John's and other. No significant difference was found between M and F. | | | | | | | | | | |

This question was posed to determine if the student sample had a connection to the forest industry in any personal way, and 11.2% of students questioned did have either a family member or neighbor attached in some way to the industry. These students lived entirely in rural communities as none of the St. John's students answered yes to this question. The largest group of students answering yes to this question live in or around Corner Brook, not a surprising finding.

The next three questions were asked to try to determine the future plans of students in science careers. Students were asked to indicate their consideration of degrees/diplomas in forestry, environmental studies and pure/applied science. It was hypothesized maybe the sample of students might not be choosing careers in science and if so, it would not be surprising their knowledge of forestry would be minimal.

Table 17: Student Survey Question 14a.

| 14a: Are you considering or have you considered a degree/diploma in forestry/forest technology? | | | | | | | | | | |
|---|---------|-----|-------|---------|-------|----------|------|-------|---------|-------|
| Stats | YES = 4 | | | | | NO = 414 | | | | |
| | M | F | Total | St. J's | Other | M | F | Total | St. J's | Other |
| # | 3 | 1 | 4 | 0 | 4 | 215 | 199 | 414 | 0 | 414 |
| % | 0.7 | 0.2 | 0.9 | 0 | 1.1 | 51.4 | 47.6 | 99.0 | 0 | 99.0 |
| No significant differences were found between St.John's and Others or between M and F | | | | | | | | | | |

Obviously forestry/forest technology is hardly on the radar screens of the students questioned. Only 0.9 of the students have considered this as a career option and none of these students live in St. John's.

Table 18: Student Survey Question 14b.

| 14b. Are you considering or have you considered a degree/diploma in environmental science? | | | | | | | | | | |
|--|----------|-----|-------|---------|-------|----------|------|-------|---------|-------|
| Stats | YES = 81 | | | | | NO = 337 | | | | |
| | M | F | Total | St. J's | Other | M | F | Total | St. J's | Other |
| # | 50 | 31 | 81 | 14 | 67 | 168 | 169 | 337 | 53 | 284 |
| % | 12.0 | 7.4 | 19.4 | 20.9 | 19.1 | 40.2 | 40.4 | 80.6 | 79.1 | 80.9 |

No significant difference was found between St. John's and Others or between M and F

On the other hand, 19.4% of students are considering environmental science/studies, including a slightly higher percentage of students from St. John's (almost 20% as opposed to 19%). Obviously students are attracted to environmental careers in much higher numbers than to forestry careers. In total, 19.4% have at least considered environmental science compared to 0.9% for forestry.

Table 19: Student Survey Question 14c.

| 14c. Are you considering or have you considered a degree/diploma in pure or applied science? | | | | | | | | | | |
|--|-----------|------|-------|---------|-------|----------|------|-------|---------|-------|
| Stats | YES = 106 | | | | | NO = 312 | | | | |
| | M | F | Total | St. J's | Other | M | F | Total | St. J's | Other |
| # | 61 | 45 | 106 | 29 | 77 | 157 | 195 | 312 | 38 | 274 |
| % | 14.6 | 10.8 | 25.4 | 43.3 | 21.9 | 37.6 | 37.1 | 74.6 | 56.7 | 78.1 |

A significant difference was found between SJ and O. No significant difference was found between M and F.

The study of pure/applied science is the strongest science preference of students questioned, but significantly more students in St. John's chose this option compared to other students. 25.4% of all students have at least considered this option and 43.3% of St. John's students have made a similar choice. The study of science outside forestry/environmental indicated perhaps students are not afraid of science as a career option, but are choosing the more traditional science fields than either forestry or environmental science. However, it can be assumed these science-orientated students will have the basic knowledge to pursue, at a later date, a more detailed area of study and indeed end up in forestry if appropriate recruitment can be made available to them.

A future career in science is the choice of a high number of students. Of these, a significant number are considering the study of environmental science. Very few are considering a degree or diploma in forestry. Thus students are aware of the variety of future science-based careers but have almost totally disconnected from the study of forestry in spite of the prominence of the forest industry in our province.

Table 20: Student Survey Question 15

| 15: Are you sure you are taking all of the necessary courses that admit you to both college and university. | | | | | | | | | | |
|---|-----------|------|-------|---------|-------|---------|-----|-------|---------|-------|
| Stats | YES = 337 | | | | | NO = 41 | | | | |
| | M | F | Total | St. J's | Other | M | F | Total | St. J's | Other |
| # | 188 | 189 | 377 | 61 | 316 | 30 | 11 | 41 | 6 | 35 |
| % | 45.0 | 45.2 | 90.2 | 91.0 | 90.0 | 7.2 | 2.6 | 9.8 | 8.9 | 10.0 |

No significant differences were found between SJ and O or between M and F

Most students claim they are taking the appropriate school courses to allow them entrance to either university or college. The approximately 10% who aren't taking the necessary courses are probably, according to teachers asked about this, not taking the necessary mathematics courses to permit them entry to many programs, or are also behind in their performance and may need another year to graduate.

A high majority of Newfoundland and Labrador's high school students are taking the necessary courses to allow entrance to most post-secondary programs, including science-based programs.

Table 21: Student Survey Question 16.

| 16: In your recollection, have you ever met anyone representing the forest sector at a career fair or similar event. | | | | | | | | | | |
|--|----------|-----|-------|---------|-------|----------|------|-------|---------|-------|
| Stats | YES = 54 | | | | | NO = 364 | | | | |
| | M | F | Total | St. J's | Other | M | F | Total | St. J's | Other |
| # | 30 | 24 | 54 | 1 | 53 | 188 | 176 | 364 | 66 | 298 |
| % | 7.2 | 5.7 | 12.9 | 1.5 | 15.1 | 45.0 | 42.1 | 87.1 | 98.5 | 84.9 |

A significant difference was found between SJ and O. No significant differences were found between M and F.

Recruitment efforts for the forest sector are either not occurring, or students do not recognize them as such. Only 12.9% admitted they had met someone from the forest sector at a career fair and only 1.5% of St. John's students had such an experience. Generally it can be said every high school student in our province attends one at least career fair in the course of his or her high school career. Also, recruiters from most recognized universities and colleges in the province and from outside make regular visits to high schools at times other than organized career fairs. This is the way most students find out the details of careers. Yet forestry and its representatives appear to be absent from this process.

It is not surprising students are not choosing forestry, though one statement from a forestry professional discussed in another section of this report indicated though he was present at a career fair, he had "no hits, not one" during his time there. Perhaps effort is made but students are ignoring it.

Perhaps it is a combination of lack of forester activity and lack of student interest.

Students are not receiving (or are ignoring) information on careers as forestry professionals in their career searches.

ble 22: Student Survey Question 18.

18: What has helped you form your opinions on the forest industry in our province? Please check the three most important to you.

| | Radio/TV | Newspaper | Environment Group | Friends/Family | WNMF | Teacher/Counselor | Parent | School Course | Industry Information | Other |
|-----|----------|-----------|-------------------|----------------|------|-------------------|--------|---------------|----------------------|-------|
| %M | 61 | 13 | 29 | 7 | 1 | 57 | 54 | 81 | 1 | 0 |
| %F | 58 | 19 | 28 | 6 | 0.8 | 61 | 49 | 68 | 1 | 0 |
| %SJ | 48 | 22 | 37 | 0 | 0 | 71 | 47 | 81 | 0 | 2 |
| %O | 59 | 14 | 24 | 8 | 1 | 56 | 50 | 74 | 1 | 0 |

Spearman Rank Correlation for M vs. F = 0.995833 indicating good rank correlation.
Spearman Rank Correlation for SJ vs. O = 0.90606 indicating good rank correlation.

The final question of the survey asked students where they got their information on the forest industry/profession in order for them to have formed an opinion. Most forest professionals believe they do try to influence public opinion and promote their profession and industry, and do try to promote what they are doing for sustainable forest management. However, analysis of the answers given in this study indicates very limited success in getting the message out.

Just why this might be so is unclear. The single biggest source of information as reported by the students themselves is clearly school, through courses (81% male and 68% female), and teachers/counselors (57% male and 61% female).

External to the school system is the media, with 61% male and 58% female reporting the information coming from radio/TV and 13% male and 16% female coming from newspapers.

Industry and NGO organization like the Western Newfoundland Model Forest, though producing significant resources, are not getting recognition. Students recognized only one per cent for each as being their source of information, yet in the writer's view, both industry and the WNMF do an admirable job producing resources that are for the most part fair, balanced and well distributed. Obviously however, these resources are not finding their way into the hands, and minds, of students in our province.

The two other main sources of information are parents (50%) and environmental groups (24%). It is not surprising parents are named as a significant source of information, but as much of this information as

reported in the results of the questionnaire is false when compared to reality, it becomes apparent the general public are ill-informed too.

Environmental groups are getting their messages out to the students and therefore, the public, at a much higher rate than the forestry profession – 24% of students indicated environmental groups such as the Sierra Club and Greenpeace are a source of their information. This fact might account for both the lack of balanced information about the state of our forest industry and increased enrolment in environmental studies programs.

The single biggest source of information on the forest industry appears to be school-based activities such as curricula, related school activities, and teachers and guidance counselors. Thus substantial efforts need to be made to ensure a balanced set of informational materials is available, teachers and counselors are in-serviced, field trips/tours are offered, post-secondary programs promoted, and many other issues of information addressed towards the school system.

COUNSELOR AND PROFESSIONAL FORESTER QUESTIONNAIRE

| KEY: | TOTAL |
|--------------------------------|-------|
| Adults Surveyed | 40 |
| Canadian Institute of Forestry | 19 |
| School Guidance Counselors | 21 |

Table 23: CIF-Counselor Survey Question 1.

| Question 1: Young are not choosing forestry as a profession because they perceive the forest industry as having a poor future in our province | | | | | | | | |
|---|-------|----------------|-------|-------------------|-------|-------------------|------|------------|
| 1 | | 2 | | 3 | | 4 | | Mean Score |
| Strongly Agree | | Somewhat Agree | | Somewhat Disagree | | Strongly Disagree | | |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.3 |
| 14 | 3 | 4 | 10 | 1 | 6 | 0 | 2 | GC = 2.3 |
| 73.7% | 14.3% | 21.1% | 47.6% | 5.3% | 28.6% | 0 | 9.5% | |
| The difference between the two groups is significant | | | | | | | | |

Literature suggests Canada's young people are not entering forestry careers because they perceive it as not having a great future. Media reports of fire, insect and similar problems, coupled with international disputes involving softwood lumber, have all been cited as reasons Canadians don't have a positive view of the industry's future. Recent plant closures in Atlantic Canada have added to the problem, as well as reports of wood shortages in our province.

Foresters strongly support this proposition, with 73.7% of survey respondents strongly agreeing and another 21.1% somewhat agreeing the perception of a poor future for their industry is causing young people to look in other directions for a career. Interestingly, counselors are not as strong on this position and a significant difference was found between the two groups with only 14.3% strongly agreeing and 47.6% somewhat agreeing to the statement.

Clearly foresters are more negative than counselors in their view on this issue, but certainly both groups strongly recognize the industry's problems as being a significant reason for the decline in forestry program enrolment.

More promotion of the industry's successes, particularly in modernization and sustainable forest management, are necessary to overcome the industry's and its professionals' negative image.

Table 24: CIF-Counselor Survey Question 2.

| Question 2: The average pay in the forest professions is above that paid for similar training and experience in the IT industry | | | | | | | | |
|---|------|---------------------|------|------------------------|------|------------------------|-----|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 2.2 |
| 4 | 3 | 10 | 11 | 3 | 5 | 2 | 2 | GC = 2.3 |
| 21.1 | 14.3 | 52.6 | 52.4 | 15.8 | 23.8 | 10.5 | 9.5 | |
| The difference between the two groups is not significant | | | | | | | | |

Studies have shown the forest industry pays better-than-average salaries to its forestry employees, yet the literature has reported young people choosing a career do not necessarily accept this reality. However, both groups appear to recognize the reality in Newfoundland and Labrador, with foresters (73.7%) and counselors (66.7%) agreeing with the statement “forest professionals in our province are paid better than IT professionals.” There were no significant differences between the two groups.

There should be better promotion among students that the forestry profession is well-paying, at least compared with other jobs requiring similar study

Table 25: CIF-Counselor Survey Question 3.

| Question #: Forest practice is seen by students as environmentally insensitive. | | | | | | | | |
|---|-------|---------------------|-------|------------------------|-------|------------------------|----|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.9 |
| 5 | 4 | 11 | 12 | 3 | 5 | 0 | 0 | GC = 2.0 |
| 26.35% | 19.0% | 57.9% | 57.1% | 15.8% | 23.8% | 0 | 0 | |
| The difference between the two groups is not significant . | | | | | | | | |

As frequently reported elsewhere in both the literature search and through the analysis of students’ opinions, the practice of forestry in our province and throughout Canada has an image as an environmentally insensitive practice. Both foresters and counselors agree, with 84.4% of foresters and 76.1% of counselors considering the image of forestry to be poor.

The image of forestry needs to be greatly improved if students are going to consider choosing careers as forestry professionals

Table 26: CIF-Counselor Survey Question 4.

| Question 4: Many students now live in an urban environment and don't have any connection with foresters or the forest industry. | | | | | | | | |
|---|------|---------------------|-------|------------------------|-------|------------------------|------|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.7 |
| 7 | 1 | 10 | 14 | 2 | 5 | 0 | 1 | GC = 2.3 |
| 36.8% | 4.8% | 52.6% | 66.7% | 10.5% | 23.8% | 0 | 4.8% | |
| The difference between the two groups is significant . | | | | | | | | |

Throughout Canada, and certainly in Newfoundland and Labrador, there is a movement out of rural communities towards more urban centers. A disconnect between people and a rural lifestyle - its historical connection with the water, the forests and the land in general – comes with this movement. Literature suggests these changing demographics account, in part at least, for a decline in the choice of forestry as a profession.

There is a significant difference between the opinions of foresters and counselors on this issue, with 89.4% of foresters believing this is a factor, while only 71.5% of counselors believe this to be a true reflection of reality. Nevertheless, both strongly believe movement from rural to urban lifestyles might be a cause of the disconnect from forestry values.

As more potential students now live in urban environments, more promotion of the forestry industry as both an important economic generator and an environmentally caring industry needs to be focused on urban schools and the urban public.

Table 27: CIF-Counselor Survey Question 5.

| Question 5: Student's don't get appropriate career information about forestry. | | | | | | | | |
|--|-------|---------------------|-------|------------------------|-------|------------------------|------|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.3 |
| 14 | 8 | 5 | 9 | 0 | 3 | 0 | 1 | GC = 1.7 |
| 73.7% | 38.1% | 26.3% | 42.8% | 0 | 14.3% | 0 | 4.8% | |
| The difference between the two groups is not significant . | | | | | | | | |

It appears both foresters and counselors agree the amount and type of career information students are getting about the potential and kind of forestry careers available is lacking in our school system. Fully 100% of foresters agree students are not getting appropriate career information, and 80.9% of counselors agree as well. Foresters are stronger in their opinions than counselors, as 73.7% strongly agree but only 38.1% of counselors strongly agree. Either way, there is consensus that more and better career information must be made available to our high school students.

More and better career information must be produced and provided to teachers, guidance counselors and students

Table 28: CIF-Counselor Survey Question 6.

| Question 6: Much forest practice now involves the implementation of multiple value approach to management. | | | | | | | | |
|--|-------|---------------------|-------|------------------------|-------|------------------------|------|-----------------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.2 GC = 2.4 |
| 16 | 4 | 3 | 6 | 0 | 9 | 0 | 2 | |
| 84.2% | 19.0% | 15.8% | 28.6% | 0 | 42.9% | 0 | 9.5% | |
| The difference between the two groups is significant. | | | | | | | | |

Much of the criticism of forest practice in the literature indicates forestry has a reputation of being primarily concerned with the needs of industry, at the expense of other more public values such as hunting, fishing, wildlife and recreational values in general.

There is a significant difference between how foresters and counselors view this issue. Again, 100% of foresters believe their work involves protecting a multiple-value forest, whereas only 47.6% of counselors shared this view. The majority - 52.4% - either somewhat or strongly disagreed that multiple values are considered in forest management in our province.

There appears to be a significant disconnect between what foresters believe they are doing and what the public, reflected here through counselors' opinions, believes they are doing.

More effort needs to be given to promoting what foresters are doing, particularly in the issues of multiple-value orientated forestry practices.

Table 29: CIF-Counselor Survey Question 7.

| Question 7: The media are generally very helpful in giving good coverage to forestry in our province. | | | | | | | | |
|---|-------|---------------------|-------|------------------------|-------|------------------------|------|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 3.4 |
| 1 | 5 | 3 | 9 | 3 | 6 | 12 | 1 | GC = 2.1 |
| 5.3% | 23.8% | 15.8% | 42.9% | 15.8% | 28.6% | 63.2% | 4.8% | |
| The difference between the two groups is significant. | | | | | | | | |

Throughout the literature there are often comments on the role the media plays in reporting a fair and balanced view of forestry issues, with most stating the media does not do a good job in fairly balancing the good with the bad.

Response to this question indicates a significant difference between what the forestry community and the public see. Only 21.1% of foresters agree the media is helpful in giving good coverage, whereas 66.7% of counselors think the media does a good job reporting on forestry issues. Again, there is a significant difference between what foresters think and what the public, through the eyes of the counselors, think.

Foresters in particular think the media needs to give more balanced coverage of forestry issues. Foresters themselves need to be more pro-active in ensuring media coverage is fair and balanced.

Table 30: CIF-Counselor Survey Question 8.

| Question 8: Teacher and Guidance councilors recognize the value of our forests to our economic prosperity. | | | | | | | | |
|--|-------|---------------------|-------|------------------------|-------|------------------------|----|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 3.2 |
| 1 | 3 | 3 | 12 | 7 | 6 | 8 | 0 | GC = 2.1 |
| 5.3% | 14.3% | 15.8% | 57.1% | 36.8% | 28.6% | 42.1% | 0 | |
| The difference between the two groups is significant. | | | | | | | | |

Many forest professionals share the opinion our school system does not do a good job teaching about the forest industry in Canada, and this lack of information might be part of the cause of the lack of interest in forestry careers.

A significant difference was found between how foresters and counselors view this issue, with 78.9% of foresters thinking the school system doesn't recognize the value of the forest economy, and 28.6% of counselors

agreeing, leaving 71.4% of counselors believing the school system is doing a good job of educating our students in the economic values of our forests.

Generally speaking foresters feel the school system undervalues the forestry industry and its professionals. The professional association and its individual members need to become more proactive in bringing the issues of forestry into the classrooms and helping ensure a balanced, accurate approach is taught.

Table 31: CIF-Counselor Survey Question 9.

| Question 9: Government, industry, and professional groups need to do more to encourage forestry careers among students. | | | | | | | | |
|---|-------|---------------------|-------|------------------------|----|------------------------|----|-----------------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 1.3 GC = 1.3 |
| 14 | 15 | 5 | 6 | 0 | 0 | 0 | 0 | |
| 73.7% | 71.4% | 26.3% | 28.6% | 0 | 0 | 0 | 0 | |
| The difference between the two groups is not significant | | | | | | | | |

Here we have almost universal agreement all relevant parties need to be doing more to promote forestry careers to our young people. Both foresters and counselors recognize the lack of a concerted effort by the profession, government and industry to produce a program that addresses students’ needs for more and better career information about forests and related careers.

All guidance counselors and all foresters agreed much more needs to be done to promote forest careers both in the classroom and in the general population. This will require commitment of appropriate dollars to fund and human resources to implement.

Table 32: CIF-Counselor Survey Question 10.

| Question 10: Forestry careers are perceived as more suitable for males than for females. | | | | | | | | |
|--|------|---------------------|-------|------------------------|-------|------------------------|-------|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 2.6 |
| 1 | 2 | 8 | 7 | 7 | 6 | 3 | 6 | GC = 2.8 |
| 5.3% | 9.5% | 42.1% | 33.3% | 36.8% | 28.6% | 15.8% | 28.6% | |
| The difference between the two groups is not significant . | | | | | | | | |

Analysis of students' opinions on this question showed almost 50% of them did not believe the profession was equally appropriate for both male and female graduates. There is also quite a spread in opinion among both foresters and counselors on this issue as well. Though the difference between the two groups is not significant, there is a wide range of opinion within the two groups.

47.4% of foresters and 42.8% of counselors agree the profession is perceived as more suitable for males than females, but 52.6% of foresters and 57.2% of counselors take the opposite view point. Thus it appears the image issue addressed in the literature is an issue in our province as well.

The forester's image needs a significant make-over to ensure it is perceived as appropriate for both males and females as a first-choice career.

Table 33: CIF-Counselor Survey Question 11.

| Question 11: Student's are put-off the study of forestry at any level because of the need to do advanced math. | | | | | | | | |
|--|------|---------------------|-------|------------------------|-------|------------------------|----|---------------|
| 1 Strongly Agree | | 2 Somewhat Agree | | 3 Somewhat Disagree | | 4 Strongly Disagree | | Mean Score |
| CIF | GC | CIF | GC | CIF | GC | CIF | GC | CIF = 2.8 |
| 4 | 2 | 2 | 10 | 6 | 9 | 7 | 0 | GC = 2.3 |
| 21.1% | 9.5% | 10.5% | 47.6% | 31.6% | 42.9% | 36.8% | 0 | |
| The difference between the two groups is significant . | | | | | | | | |

This last statement was put forward to try to determine if the high science content required of the study of forestry deterred some students from looking at it seriously. It has been suggested in the literature that forestry is often looked at as a poor cousin to other science programs since it is sometimes perceived as not providing the academic rigor of pure and applied science programs.

Foresters feel strongly this is not the case - 31.6% of foresters agreed mathematics is a block to making forestry appealing, whereas 57.1% of counselors believe this to be the case. Thus it could be argued counselors believe forestry is NOT a program for the best and the brightest, whereas

foresters, who are aware of the academic rigor inherent in the programs, believe the study of forestry is meant for academically able students.

Forestry needs to take its place among other science-based careers as being understood to require strong science and mathematics knowledge, thus making it more appealing to all students considering a career in science. Forestry needs to be made attractive to the province's best and brightest students

WHAT FORESTERS AND GUIDANCE COUNSELORS HAVE TO SAY ABOUT THE STATE OF FORESTER AND TECHNICIAN TRAINING

Both samples of CIF members and counselors in our high school system were asked to comment on three questions:

- 1) Research suggests students are choosing environmental studies options more than forestry options at the post-secondary level. Why do you think this might be so?
- 2) What do you think industry, government and other interested groups need to do to reverse the trend away from the study of forestry as a first-choice career option?
- 3) Are there any other comments you would like to make?

Respondents in both groups answered these three questions and often, the opinions of both groups were quite similar. But spread throughout the guidance counselors' responses was the factor of work load, with many complaining their time is spent helping with behavior and discipline problems rather than offering direct career guidance. Several also reported top students in their schools came to them mostly for help with university applications or references for scholarship programs, with not much time spent offering help on direct career choices. These students, many of whom could be interested in science programs such as forestry and forest engineering, present themselves to the guidance office not for help deciding on a career, but for help getting into the university and program they have already chosen.

The following will provide an overview of both groups' opinions. Many respondents requested their comments not be attributed.

MEMBERS OF THE CANADIAN INSTITUTE OF FORESTRY

Nineteen of 25 randomly selected CIF members responded to the questionnaire. Respondents include both degree and diploma graduates, and represent industry and both levels of government.

All respondents believe there is a negative perception of the work foresters in our province do. This perception is believed to be wide-spread throughout the population and caused by: reporting inaccurate information about what is happening in our forests, lack of industry and government promotion of the work their foresters do, lack of promotion of the economic benefits the forest industry creates to the province, and general misunderstanding of forest harvesting practices and how they affect the environment.

“Negative perception are based on a focus of many environmental groups and media (particularly in past campaigns in Western Canada and other areas) on negative aspects of clear-cutting, insect spraying, monocultures, herbicide spraying and other contentious issues. Perception have formed an opinion of foresters as profit-driven loggers with no concern for the environment.”

“The general perception is that anything with ‘environmental’ in the name is inherently good.” “.....environmental studies, in recent years, are perceived as being more socially acceptable.”

The feeling the media is directly to blame for misconceptions in forestry is widespread throughout the comments. Most say they believe the media reported negatively on the state of our forests, using environmental groups’ reports almost exclusively when commenting on forestry issues and making little or no attempt to provide a balanced approach to their reporting.

“I think media has taken over a great part of the way our children make decisions. Family and community was an avenue where children could model their choice careers by living near the source ... Media tells them what’s going on: how to dress, what’s important and what’s not. Sensationalism has taken over - no longer Dad or Mom going to harvest some wood for the winter - they are killing the trees and destroying the forest. This is the first year we will not have a Christmas tree - the kids don’t want to kill a tree.”

“Students simply hear more about ‘the environment’ ... than they do about forestry ... there is certainly more about the environment in the media, i.e. the environment has a much higher profile.”

Several reported they felt that the school system did not support the study of forestry issues in the classroom, and the curriculum mishandled economic issues in particular.

“I think the idea of forestry the average student has is simply planning on cutting down forests and this relates to the education they have received from Kindergarten to Grade 12, plus the negative media coverage, combined with their perception of the world that does not include any economic realities (also not taught). They want no part of it and do not realize what the options are for a career in forestry.”

“A stronger forestry component in the public school is needed. Educating our children needs to become an integral part of our forestry careers, such that children are exposed to what we do as part of the curriculum, not just during ‘forestry week.’ ”

“Start early in the school curriculum with a focus on careers and resource management. Use practical examples versus an academic perspective, or just use both.”

“... add to the school curriculum meaningful and mandatory study on the role of forests in our province both from an environmental and economic viewpoint.”

There was also some criticism for the nature of forestry programming at Canadian universities deterring some students’ choices. Several mentioned the five-year requirement at UNB, and others mentioned lack of options in most forestry degree programs. SWGC’s forestry program closure also drew criticism.

Many environmental studies students see the forestry program as restrictive and useful only if your career goal is an industry forester.”

“...work with forestry schools to ensure balanced, integrated approach to forestry is being taught.”

“...having to move away to finish the degree, I think, is a major problem for many of our young people, particularly as they can complete a degree in environmental science in Corner Brook.”

“The closure of SWGC’s program may have sent a message to our students that there is no future in forestry in the province.”

“...I find that there certainly has not been enough effort made by SWGC administration to support the faculty resources to provide a viable forestry program, which is an ultimate shame.”

With all the resources and expertise SWGC could draw on in the area, such as government departments, post-secondary education facilities, and industry, the respondent believes *“SWGC could easily have one of the finest forestry undergraduate and graduate programs in the country. But, the support and commitment has just not been there.”*

“Surprisingly, many of those doing environmental science in Corner Brook or St. John’s have no idea what the dominant trees in the forests around Corner Brook or within central Newfoundland are. They are also not aware of the major issues facing forestry nationally or globally, indicating a poor coverage of forestry in MUN’s environmental science program.”

There was also much comment on the forestry community’s lack of involvement in students’ daily lives. Some respondents criticized industry and government, and foresters themselves, for not getting their messages out, and not being more proactive in pushing the profession’s positive aspects to ensure a strong future not only for industry, but for a healthy forest.

“(Foresters should be) going to schools and educating the students and teachers. There is a lot of misinformation out there about forestry and what it really is! Also, more field trips to forest activities that are non-timber related ... and educate on why if there is clear cutting done and why it is done. They need to know that there are huge opportunities out there in forestry and that they can make a career of it and still live in Newfoundland and Labrador.”

“I think that we need to get more involved in the high school program and have a plan to take every high school student out for a one-day woodlands tour. This is a big effort, but if all levels of government and industry get together it can be accomplished.”

Further, “we have proven through our woodlands tour that most people have a very bad impression of the forest industry and how our forests are managed. However, when they get the chance to see the forest being managed, they very quickly change their minds and all of a sudden it is a good place to be again.”

“Other sectors are also faced with impending shortages of qualified people in the near future. However, most of these sectors seem to be much more aggressive in attracting young people to their various professions, and its working. I was recently involved in a career fair at Elwood High in Deer Lake, which was set up to give students an opportunity to talk with people in the various professions. I was at the forester table next to the RCMP. The RCMP was swamped with interest and I never had one single hit...no, not one!”

“There is a perception, a wrong one, that environmental studies students have a broader training than foresters. Foresters have not demonstrated their abilities fully.”

Most respondents had numerous suggestions to improve the image of forestry and increase interest in forestry careers. Some also said it was a serious problem that might mean the end of any forestry training in the province.

“If we don’t do something meaningful very soon, I fear for the future of our profession in this province and while I know it is a problem right across the country, I feel it is more serious here.”

“We need money and lots of it thrown at this problem. Government and industry have to be brought to reality about the serious problem or soon the whole population will be ready to disregard the forest industry as so much garbage.”

“If we don’t do something soon, the future of our forests will be in some jeopardy. My suggestions for action center around the companies and the government doing something major to improve their own images and for the forester community to stop complaining and get their own organization active and involved in telling the story of their work.”

“Most people don’t have the slightest idea what the federal government’s role is in their forests and that’s the CFS’s fault entirely. We do great work but we don’t do anything to promote it.”

“There needs to be a system of internships and scholarships to encourage forestry training. Young people need incentives to make specific choices and if we as an industry made a concerted effort to guarantee summer jobs and financial help toward tuition, there would be too many people applying!”

“Forestry professionals and technicians need to become more aggressive in demonstrating that they have knowledge and skill sets that can be employed in many disciplines.”

“Industry, government and NGOs need to work more with the forestry programs such that students know the jobs are waiting for them at the end, as well as during the course of study (i.e. summer placements, course funding etc.).”

“Be proactive in informing students, teachers and guidance counselors about forestry and the forest industry. Improve the image of the forest industry and forest management in the eyes of the general public. Industry needs to get more involved in the community in general so the public will recognize their importance.”

“We need more promotional materials and much more effort put into profiling our sector. The NLFPA’s TV ads geared to putting a face on our industry are an excellent way to achieve this. We just need more of it.”

The same writer goes on to say “... we need to rebuild our image - totally. This means actually doing things better and making sure people hear about it.”

“Stop taking it on the chin and get on with doing something about the situation. Maybe this study will wake some officials up to the real problem ... that there are no trees in St. John’s.”

“Improve the visibility of the profession. Demonstrate skills sets and knowledge to the public and employers. Strengthen professional associations who should become more pro-active. Work with forestry schools, government agencies and school systems to improve information.”

Perhaps the entire problem can be encapsulated by the following statement:

“Sometimes we as foresters are asleep at the wheel. We know how good our jobs are, we know we get reasonably well paid, we know we have a positive impact on the environment and we know we will always be needed. It’s just that we don’t have any visibility. Perhaps we spend too much time in the woods or in the lab or in front of the computer. We certainly don’t spend it in front of the TV camera or newspaper reporter or in the classroom. Let’s get ourselves organized, hire some staff and make a real impact as professionals and as a professional organization.”

HIGH SCHOOL GUIDANCE COUNSELORS

A total of 21 high school guidance counselors responded to the questionnaire out of a random sample of 25. These counselors represent all regions of the province, including Labrador, and work in both large and small high schools.

Generally speaking, responses were less specific on issues than those of CIF members and tended toward more general problems in accessing good sources of information and resources for their students. They complained because of their timelines, students are generally left to their own devices within the resources of the school unless a student was specific in their request about a particular career. Many counselors complained they had little time for general career help and relied on such events as district-wide career fairs to provide their students with information. Many students were also encouraged to do their own computer searches when seeking information.

In several direct interviews the researcher had with guidance counselors, there was no doubt the counselor’s role in many schools is often shaped by students with social, behavioural and psychological concerns, and by

demands from university-bound students who need letters of reference for admission, scholarships, and special consideration. Issues of career and vocational guidance often are dealt with only if time allows, and are often test-based through interest and other similar inventories. Interpretation of these results often gets put off by some emergency.

Nevertheless, guidance counselors did have comments on the subject of the research. And like CIF members, many felt forestry suffers from bad press and a poor reputation among young people.

“There is no doubt that the young people I deal with on a day-to-day basis want a better world and look at the environmental movement as a place where they can relate to their feelings of care and concern for the planet. While I don’t have any direct reason to say this, I suspect they feel the opposite about the forest industry.”

“Personally, I feel a strong attachment to the environmental movement and I know many of my colleagues feel the same way. Foresters who work in industry are not considered to be environmentally caring.”

“The idealism of youth almost precludes their embracing forestry as a career because of all the bad publicity it receives over issues like spraying, clear cutting and the like. Perhaps if they saw it up close, were shown the work of the forester, generally, were shown all the facts they might be more interested.”

“All my students grew up in an urban environment and have really no knowledge of the forest. That is a sad fact, but true. Perhaps it is this feeling of detachment that precluded their interest in forestry. They of course read and hear all the time about the national and international environment issues.”

“Some of my students have never been in a forest.”

The guidance counselors also felt there was no or little information available for their offices, and contact with foresters was practically non-existent. While many felt overwhelmed by their more needy students and therefore didn’t have the time to obtain more information on just one profession, they felt if the industry and professional associations were more proactive in their schools, more students might look at forestry as a viable choice.

“I have never ever been approached by a forester or anyone representing the forestry profession requesting access to the students of this school. I don’t have any information to give a student if one came and asked for some. All I could do is refer the student to the computer for a self-directed search.”

“Students do not see forestry as a long-term career option. Also, they do not know the careers associated with the forest industry.”

“We generally leave the explanation of college and university programs to the institutions themselves. They have a lot of access to our students. If after such a meeting a student has a specific request, I’ll do my best to help, but usually the representative from the institution is the only source of information the student gets. And if they aren’t interested in forestry, nothing else is done to change their minds.”

“I have been to career fairs, often put on by either post-secondary institutions or by the school board. Students often are attracted to specific institutions rather than to specific programs. The attitude is often ‘what school should I choose?’ not ‘what program will I take?’ They often seem to make up their minds about programming only after first choosing the institution. A lot of career work is actually handled by the institution the student chooses.”

Generally speaking most guidance counselors felt careers were chosen long before a visit to the career office. It was only in rare cases their intervention was necessary. Many of their students seem content to follow a path that set for them by a variety of experiences.

“Many students might ask me where such and such a program is offered and I’ll help them find the appropriate institution. But generally I don’t have much input into how the career choice was made. It a combination of life experiences, classroom work, parent involvement, etc.”

“In my experience, career choice is as much the parental choice as the student’s, initially at least.”

“Students either chose their initial career path because of parental or teacher encouragement, or sometimes by peer involvement. I suspect that choosing environmental studies over forestry is as much an expression of parental, classroom and peer involvement as it is anything else.”

Guidance counselors were less forthcoming on how government, industry and professional associations might help attract more students to forestry-related training programs. Most of the suggestions centered on more information, more active professional participation in the life of the school, and a stronger presence from forestry education institutions in such events as career fairs.

“If institutions like the College of the North Atlantic want more students in their forest program, it’s their responsibility to do more when they come to the school. I know they have many programs and its difficult to know how they can single out one from all the others.”

“There are career shortages in many different professions and trades, and less students around these days to take programs. If foresters and forestry schools and colleges want more applicants, I think they are going to have to make the pitch themselves, and it will need to be a strong one.”

“I really don’t hear much about forestry around here. We are far removed from any industrial or harvesting operations. Forestry as a career is just not in the minds of people here. To change this is one big task, but it seems to me that with the importance of forestry to our province, money and effort will have to be invested.”

“I really have no idea about jobs in forestry. You say there will be a shortage in the future but I’d not heard about it before. Is it that serious? If so, then the government and industry are the ones who need to do something about it, like the spending of money promoting the jobs that will be there and no one to fill them. There’s nothing like available jobs to motivate students.”

“In-servicing and promotion. I and my other career counselor friends would like to be in-serviced in the different options and careers associated with forestry.”

Most of the guidance counselors' suggestions about how to solve the shortage centered on more resources. One counselor in particular pointed out how active the trades unions and trades schools have become in telling the story about the massive skills shortages likely to affect Canada in the next five to 10 years. Organizations like Skills Canada have been very active in promoting the shortage, and enrolments in trades training programs have almost doubled in the last year alone. He believes the forestry profession and industry have to put a face on the problem and invest time, energy and resources to help in the solution. He also said many other professions are facing the same kinds of problems and so are all "fighting" over the best and the brightest of our diminishing numbers of high school graduates. As he wrote:

"I have seen a 10% drop in my high school over the past couple of years and that will fall even more over the next few years. Foresters are not the only group facing large numbers of retirements between now and say, 2010. Even now I can't get a plumber and I can't get a doctor. The trades and the medical professions are just two of the many groups who are spending considerable resources in trying to attract students to them. I have not seen anything from the foresters."

In summary, it seems both the forestry profession and guidance counselors in our schools believe the problems of declining enrolments can be summed up in a few concise statements.

- 1) Forestry has a poor image among our total population and among young people in particular.
- 2) Our industry, government and professional organizations have done little to try to improve the image of forestry in our province.
- 3) Information is lacking on professional opportunities in the forest sector.
- 4) Significant resources need to be put toward the problem by all three parties.
- 5) Strong competition for the available pool of high school graduates already exists - competition that is armed with better resources designed for recruitment than the forest sector.
- 6) Educational institutions delivering forestry training need to promote their programs in a more meaningful way.

- 7) Significant effort needs to be put into primary and secondary school curricula to better emphasize the role of forestry in our province and the good work now being done in sustainable forest management.
- 8) The job of the forester has to be made to appear more glamorous than it is now perceived.
- 9) The economic importance of the forest sector to the province needs to be taught in our schools.
- 10) Guidance counselors need ready resources - a no-hassle, proactive set of materials to distribute to students who might be interested in forestry. Similar materials need to be made available to all teachers who could be involved in teaching forestry at all grade levels.
- 11) Guidance counselors want to be in-serviced by the profession on options available for their students.

WHAT FOREST TECHNOLOGY STUDENTS ARE SAYING

Students enrolled in natural resources programs at the College of the North Atlantic, Corner Brook Campus, were asked to answer the following question:

What are the FIVE most important reasons students are NOT choosing forestry as their first career choice?

All students enrolled in both first and second years of the programs were asked to give their responses individually without trying to bring consensus to the answers. The reasons were varied and for analysis, the writer tried to group the responses into categories. The following table shows the clusters of these answers from the five groups who responded to the question. A total of 66 students each gave up to five reasons. The most common reasons are shown below.

| KEY: | TOTAL |
|------------------------------------|-------|
| Students Surveyed | 66 |
| Forest Resources: First Year | 17 |
| Forest Resources: Second Year | 15 |
| Environmental Studies: First Year | 13 |
| Environmental Studies: Second Year | 7 |
| Fish and Wildlife Management | 14 |

Table 34: Student Survey Question Table

| | All #66 | Forestry 1. #17 | Forestry 2. #15 | E.S. 1 #13 | E.S. 2 #7 | F & W #14 |
|--|-------------|-----------------|-----------------|------------|-----------|-----------|
| Jobs not available in our province, and/or need to leave to find work. | 71* 100% | 20 | 16 | 14 | 7 | 14 |
| Poorly marketed as a career choice by all parties concerned with the profession. | 59 89% | 16 | 14 | 11 | 6 | 12 |
| Don't like working outdoors. Poor working conditions. | 31 47% | 10 | 7 | 2 | 3 | 9 |
| Poor salaries, little opportunity for advancement. | 31 47% | 7 | 8 | 8 | 3 | 5 |
| Better opportunities in IT/trades. | 26 39% | 10 | 4 | 5 | 0 | 7 |
| Course perceived as too difficult, too long when compared with other options. | 18 27% | 3 | 6 | 3 | 3 | 3 |
| No information about forestry careers in high school. | 18 27% | 4 | 7 | 4 | 0 | 3 |
| Industry/professional has poor image. | 16 24% | 5 | 3 | 5 | 1 | 2 |
| Course too expensive/too high debt afterwards. | 6 9% | 2 | 3 | 1 | 0 | 0 |
| Many students live in urban environment and have no interest in forests. | 6 9% | 3 | 3 | 0 | 0 | 0 |

* All students listed either no jobs available or the need to move away to find employment. The actual percentage is 100%+.

Several other reasons were given by individual students including: forestry can be dangerous, the course is boring, there are no work terms in the forestry program, and there is too much technology taught in the program.

It is particularly interesting to note there are no significant differences (through Chi-square analysis) among the various classes of students in the college's natural resources department. Students gave the same range of

problems whether they are enrolled in forestry, environmental science, or fish and wildlife programs.

There were also responses from some members of the college's natural resources teaching staff, who generally agreed the main reason students don't choose forestry has to do with the profession's poor public image. They also felt the forestry profession has provided little leadership in promoting itself as important and viable.

Staff members also said the public school system did little to promote either the value of the forests or careers in forestry. and industry/government have not provided adequate leadership in providing jobs and/or opportunities for its graduates.

Analysis of the student's answers shows the most prevailing reason they believe enrolment is low has to do with perceived lack of forestry jobs in our province and/or the resulting need to move away to find work. Fifty-six of the 66 students listed poor job outlook, 10 others named the need to move away to find work, and five students listed both reasons. Students are concerned about the job prospects for forest resources graduates in very high proportions and feel strongly this is a primary reason for low enrolment.

The next most "popular" reason listed was forestry as a career is poorly marketed by industry, government, professionals and the college itself. A total of 59 students (89%) listed poor marketing/lack of information as a reason for lower enrolment.

This reason was followed by poor working conditions (listed were heat, cold, flies, etc.) and/or a general dislike of the outdoors. A total of 31 students (47%) gave this reason.

Thirty-one students (47%) expressed low wages and little opportunity for advancement as deterrents, while 26 students (39%) felt better opportunities in the IT sector and/or the trades made forestry less popular.

Eighteen students (27%) felt the forest resources technology program was perceived as being too difficult.

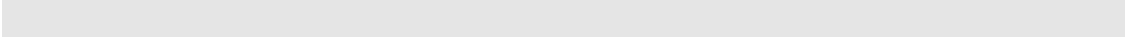
Eighteen students (27%) blamed poor or non-existent information in schools about the profession and about forestry in general as a reason, and 16 students (24%) felt the profession and industry have a poor environmental record that turns potential students away from this program.

Six students (nine per cent) felt living in an urban environment precludes interest in forestry and six students (nine per cent) also felt the course was too expensive and the resulting debt load too high compared with other programs and starting salaries.

From the students' perspective, industry, government and the profession need to address the issue of employment. If perceived lack of employment opportunities is causing a decline in enrolment, all parties need to address this issue by presenting the facts of actual demands for forest technicians and professional foresters in our province. This study has shown, nationally at least, a severe shortage of forest professionals is predicted in the next five years from retirement of existing staff. And, the writer believes, this shortage will be felt in our own province as well

Information from the college itself also indicates a high level of appropriate employment opportunities for its most recent graduates and that, in reality, the current job market in our province is good still.

Thus the "poor employment" perception, coupled with the students' other reasons indicates, yet again, a pressing need to strongly promote the profession - a need felt even among those who have already chosen forestry as a career.



SUMMARY OF RECOMMENDATIONS AND CONCLUSIONS

FROM THE LITERATURE

- 1) The profession of forestry throughout the world is in a state of flux. In developing economies there is a severe shortage of trained professionals to help nations use their forests for direct economic benefits and to stop eroding its forest resources for other purposes such as agricultural use. Professional training opportunities are limited, and better cooperation between developed and emerging economies is seen as one part of the solution
- 2) In the more established economies of Europe, the economics of good forest management is broadly accepted and the forest industry seen as a major benefit. There is nevertheless a significant decline in enrolments in many European forestry programs, notably in the UK, where declining enrolments have seen the suspension of well-established programs, for example at Oxford University.
- 3) The USA is facing a major decline in enrolment at its forestry schools and this has also led to the suspension of several prominent programs and the reduction in scope of several others. The image of the forest industry and of its professions is generally perceived as poor, with environmental issues and poor professional practices as the main complaint.
- 4) In Canada there has been a significant decline in enrolments in most university and college programs in every province except Quebec. Several programs have been suspended, notably the University of Toronto's undergraduate program.
- 5) The forest industry's poor image among Canadians is a result of several factors, namely poor economic indicators arising from such problems as the soft wood lumber dispute; massive damage from insects and fires, particularly in BC; and the perceived lack of environmental concern, particularly by the forest industry.
- 6) The general perception is: forestry education has not caught up with the times, uses old or non-existent technology, is dominated by white males, only attracts those who can't get into other programs, isn't academically challenging, and generally has little or no relevance to the "real" world of work as defined by the "new economy."
- 7) In a similar vein, there is a perception forestry programs, though technologically sound, are still not offering the courses necessary for the modern forestry professional to do their work. This perception is a direct result of the accreditation program that values harvesting, growing and protecting trees over more socially and ecologically based duties.

- 8) On a more general front, most high school students are best defined as urban dwellers that don't have much of a perception of work in the forest and don't know about or appreciate the value of Canada's forests, nor the opportunities available for meaningful work.
- 9) Parents, teachers, guidance counselors, and others who help students choose their careers themselves have a poor perception of the state of Canada's forests and forest industries, and actively discourage the choice of forestry as a career.
- 10) Many students who traditionally would have chosen forestry as a career are now choosing more "environmentally responsible" careers in such areas as environmental science, or fish and wildlife management.
- 11) There is still the perception that forestry is NOT for women even though in reality more and more women (but still less than the proportion attending post-secondary education generally) are choosing forestry degree and diploma programs. It is still considered a "man's" profession and this stigma discourages women from applying.
- 12) Industry, government and forestry professional groups have not done enough to promote their activities as environmentally sound, and have not persuaded the general public that sustainable forest management and ecologically sensitive practices have a very high priority in harvesting decision-making. Environmental groups have done a better job portraying much forestry practice as being irresponsible.
- 13) Government generally has not been successful in getting out the message the health and good stewardship of Canada's forests is crucial to our economic well-being. It has also been unsuccessful in promoting Canada's significant role in international forestry development.
- 14) The reasons for Newfoundland and Labrador's decline in enrolment for both degree and diploma programs available to our students are not clear, as little information is available to point us in any particular direction. Perhaps it can be assumed the reasons are parallel to those in other areas of Canada, and that there may be other causes. Among these causes might be the general perception our own government has undervalued our forest industry, particularly in light of the apparent higher priority given to issues surrounding off-shore oil and gas.
- 15) Students are choosing environmental science over forestry degree programs simply because they are offered in full in Newfoundland and Labrador, while pursuing a forestry degree requires relocation to UNB at the closest. The UNB degree is also a five-year program and perhaps this is

perceived as a further barrier when most other programs are four years to the awarding of the baccalaureate.

FROM THE HIGH SCHOOL QUESTIONNAIRES

- 1) Students generally feel professional forestry professionals are paid less than people in jobs requiring equivalent education.
- 2) The image of the forester in urban environments in particular may be based on a stereotypical picture of the traditional lumberjack, and not that of a professional science and technology graduate.
- 3) Students clearly have a negative view of the forester's role in protecting the environment, and believe forestry is not concerned with environmental issues.
- 4) There is a strong perception there are few opportunities for employment in the forestry professions.
- 5) A major source of students' information about forest industries and professions is school curricula and related activities.
- 6) Students generally, and female students in particular, feel there are not equal opportunities for females in the forestry professions. The profession clearly needs to enhance its image as an equal opportunity workplace.
- 7) Both industry and government need to better articulate the economic importance of forestry industries to our province.
- 8) The image of the forestry professional needs to be changed from that of the stereotypical lumberjack to that of a sophisticated, high-technology scientist.
- 9) Future professional opportunities in forestry need to be promoted, especially in light of anticipated skill shortages predicted for the near future
- 10) Industry, government and forestry professions need to help ensure the media reports a more balanced picture of successes in sustainable forest management.
- 11) The negative economic image of forest industries needs to be addressed by highlighting industry and government efforts to address such issues as wood supply, capital investment, modernization and mechanization.
- 12) The picture of the typical forester working outside with chain-saw in hand needs to be replaced by the typical forester in an office environment -

one using computers and other advanced technology as decision-making tools.

13) Students hold the forestry professions in very low esteem. All parties concerned about the future of the profession need to cooperatively address students' misunderstandings through a comprehensive program using all available means to positively promote the correct image of the industry and its professionals.

14) A future career in science is the choice of many students. Of these, a significant number are considering studying environmental science. Very few are considering a degree or diploma in forestry. Students are aware of the variety of future science-based careers, but have almost totally disconnected from the study of forestry in spite of the prominence of the forest industry in our province.

15) A high majority of Newfoundland and Labrador's high school students are taking the necessary courses to allow entrance to most post-secondary programs, including science-based programs.

16) Students are not receiving (or are ignoring) information on careers as forestry professionals in their career search.

17) The single biggest source of information on the forest industry appears to come from school-based activities such as curricula, related school activities, and from teachers and guidance counselors. Substantial efforts need to be made ensure a balanced set of informational materials is made available, teachers and counselors are in-serviced, field trips/tours are available, post-secondary programs are promoted, and many other issues of information are aimed at the school system.

FROM THE GUIDANCE COUNSELOR AND PROFESSIONAL FORESTER QUESTIONNAIRE

1) More promotion of the industry's successes, particularly in modernization and sustainable forest management, are necessary to overcome the negative image of the industry and its professionals.

2) Students should be informed the forestry profession is a well-paying profession, at least compared with other jobs requiring similar length of study.


3) Forestry's image needs to be greatly improved if students are going to consider choosing careers as forestry professionals.

- 4) As more potential students now live in urban environments, more promotion of the forestry industry as both an important economic generator and an environmentally caring industry needs to be focused on urban schools and the urban public.
- 5) More and better career information needs to be produced and provided to teachers, guidance counselors, and students themselves.
- 6) More effort needs to go into promoting the work foresters do, particularly in the issues of multiple-value orientated forestry practices.
- 7) Foresters in particular believe the media needs to provide more balanced coverage of forestry issues. Foresters themselves need to be more proactive in ensuring media coverage is fair and balanced.
- 8) Foresters feel the school system undervalues the forestry industry and its professionals. The professional association and its individual members need to become more proactive in bringing the issues of forestry into the classrooms, and helping ensure a balanced, accurate approach is taught.
- 9) All guidance counselors and all foresters agreed much more needs to be done to promote forest careers both in the classroom and in the general population. This will require commitment of appropriate dollars to fund and human resources to implement.
- 10) The forester's image needs a significant makeover to ensure both males and females perceive it as an appropriate first-choice career.
- 11) Forestry needs to take its place among other science-based careers as requiring strong science and mathematics knowledge, thus making it more appealing to all students considering a career in science. Forestry needs to be made attractive to the province's best and brightest students.

FROM THE WRITTEN COMMENTS OF COUNSELORS AND FORESTERS

In summary, both the forestry profession and guidance counselors in our schools believe the problems of declining enrolments can be summed up in a few concise statements:

- 1) Forestry has a poor image among our total population and among young people in particular.
- 2) Our industry, government and professional organizations have done little to try to improve the image of forestry in our province.
- 3) Information on professional opportunities in the forest sector is lacking.

- 4) All three parties need to put significant resources toward the problem.
 - 5) Strong competition for the available pool of high school graduates already exists, and this competition is armed with better recruitment resources than the forest sector.
 - 6) Educational institutions delivering forestry training need to promote their programs in a more meaningful way.
 - 7) Significant effort must go into primary and secondary school curricula to better emphasize forestry's role in our province and to emphasize the good work now being done in sustainable forest management.
 - 8) The forester's job has to be made to appear more glamorous than it is now perceived.
 - 9) The forest sector's economic importance in our province needs to be taught in our schools.
 - 10) Guidance counselors need ready resources - a no-hassle, proactive set of materials to distribute to students who might be interested in forestry. Similar materials need to be made available to all teachers who could be involved in teaching forestry at all grade levels.
 - 11) Guidance counselors want to be in-serviced by the profession on the available options for their students.
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INTRODUCTION

From the literature review and surveys and comments of students, counselors and foresters, it has been made very clear the forest industry and its professional workers are generally misunderstood at best, and disdained at worst. Industry is suffering from bad press, and a misperception of its economic importance to our country and of its efforts to improve its image as valuing sustainable forestry and multiple use.

It is generally believed forestry is a shrinking industry in our country and cannot survive easily in face of demands for more sustainability and environmental protection.

The sector's employees, particularly its forestry professionals, are suffering from this general malaise about the industry's future and are blamed particularly for the perceived lack of sustainable forest management and poor environmental records. After all, it's the foresters and forest technicians who help trees grow and plan for them to be cut down. They are perceived as working exclusively for industry and as having no regard for our forests other than as a source of fiber for mills and plants.

This study finds forest professionals are blamed for all the woes in our forests (real and imagined) and this blame is significantly affecting the choice of forestry careers among Canada's youth.

This situation has led to decreasingly low enrolments in both degree and diploma programs all across Canada. This is true in most jurisdictions, including Newfoundland and Labrador. It appears most universities and colleges in every province have made some effort to address this problem, and this study is part of our province's effort to come to grips with our own problems, which include loss of Memorial's pre-forestry program at Grenfell College and an unprecedented enrolment decrease in the College of the North Atlantic's forest resources technology program.

This is not just a problem for our educational institutions. Many current forest professionals in Newfoundland and Labrador are nearing retirement. The negative attitude towards the industry's efforts at forest management and environmental protection is unusually strong. Therefore, there is a strong need for government and industry to try to overcome this negative attitude with an increased presence in the public's eyes since more, not fewer, forestry professionals will be needed in the years ahead.

While there is a significant pool today of unemployed forest professionals, particularly forest technicians, this pool of men and women will quickly become depleted if indeed they are still interested in working in this

profession when the positions open up. Who then will be available to fill the retirement voids and newly created positions? And what will happen when we have few, if any, training opportunities available within our province? This should be a major concern for industry, government and forest professionals.

If efforts are not now made to increase the perceived value of our forests, the industries that use them, and the men and women who manage them, there may well be no training opportunities available within our province and we will be forced to import these skilled professionals into the province.

What can we as a province do to try to promote forestry in all its parts to all of its publics? The process must be comprehensive and should be the result of consultation with all partners, industry, governments, secondary school system, and post-secondary institutions. The process is multi-faceted, addressing the different issues in different ways. There is no magic solution, but these major problems require a solution if our province is to maintain, protect and develop its forests.

Thus this study has identified the following as a series of first steps, directed at each of the major players, to help overcome the problems.

SECONDARY EDUCATION

1) Develop ways and means to promote provincewide forestry issues in general and forestry as a first-choice career option among young Newfoundlanders and Labradorians. It is unlikely changes in the school curricula and programs, or production of materials for both teachers and counselors, will come from the Department of Education or school boards without significant input and direction from the forestry sector. The following suggestions may be considered:

- i) Produce appropriate materials for career counselors to use outlining available career options in forestry.
- ii) Provide workshops and general in-servicing for career counselors and other school officials about the current and future needs for professional foresters.
- iii) Develop materials on forestry issues for use in classrooms at the elementary, junior high and high school levels and in-servicing for all teachers who teach these segments of the curricula.
- iv) Develop a web site specifically devoted to forestry career information and issues

- v) Implement a process to try to get every student to participate in a woodlands tour, similar to that now offered by Corner Brook Pulp and Paper, at least once in his/her junior high school career.
- vi) Develop a process to be present at as many career fairs and similar events as human resources will permit, including creation of a professional display and materials.

POST-SECONDARY EDUCATION - THE COLLEGE OF THE NORTH ATLANTIC

2) In the short term, the only post-secondary institution involved in direct forestry training in our province is the Corner Brook campus of the College of the North Atlantic. This institution recognizes the importance of keeping its diploma program in forest resource technology active and continuing to make a significant contribution to the profession. However, as enrolment declines, there are concerns the program's future might be in jeopardy. Such an event would set back forest development, management and health. Thus the forest resource administration and staff of CNA might consider:

- i) Promoting the forest resource program outside general promotion of all other college programs.
- ii) Trying to obtain more financial support in the form of return of service contracts from industry and government for forestry students.
- iii) Ensuring the high-tech forester's image is promoted more widely and the lumberjack image is discouraged.
- iv) Ensuring curriculum advances a multiple-value philosophy of forest management, while ensuring the profession's technical needs. Consider the possibility of integrating (possibly paid) work-terms into the present curriculum.
- v) Continuing to develop advanced partnerships with the University of New Brunswick to integrate its forestry programming as fully as possible so forest technology graduates are granted maximum credit transfer toward degree programs.
- vi) Increasing promotion of the CNA/UNB linkages so potential students are aware of career possibilities inherent in these linkages.
- vii) Investigating the potential for an integrated program with Sir Wilfred Grenfell College (and thus Memorial University) and the College of the North Atlantic. Such a program may layer a

university science program with forestry major with the forest resources technology technical program to produce either a bachelor's degree or even a master's degree in forestry, taught entirely in Corner Brook. A model for this integrated approach might be found in the University of Toronto's newly created master's program.

- viii) For a short-term solution to declining enrolments the college should, if not already doing so, work with the Humber Education Alliance to attract overseas students to the forest resources technology program, and increase marketing to urban students, particularly in St John's.
- ix) Since most current students believe job prospects in the field are poor, the college needs to address, with appropriately current statistics, the profession's current and future need for educated forestry technicians. It should also highlight the successes most recent graduates have had in finding appropriate employment.
- x) Increasing marketing efforts directed specifically at women and Native people.

POST-SECONDARY EDUCATION - SIR WILFRED GRENFELL CAMPUS OF MEMORIAL UNIVERSITY

3) Memorial University discontinued its pre-forestry program and its formal linkage with the University of New Brunswick primarily because of declining student registration. The program was possibly the first casualty of Newfoundland and Labrador students' lack of interest in forestry as a career. The university still offers the first year of UNB's program, but potential forestry degree students must transfer to UNB for four more years of study.

The university's future plans forestry education are unclear at this time. Thought seems to center on a bachelor's degree in science with a forestry major but, to the writer's knowledge, university officials have not articulated much in this matter. What seems clear is such graduates would not possess the necessary technical skills to meet the needs of many of the positions industry and government will offer. Further study at another institution would be required to obtain these skills, assuming the university would not be able to build and equip the facilities required to teach technical portions inherent in the professional forester's education. Future development at Sir Wilfred Grenfell College might include:

- i) Reinstating its two-year pre-forestry program if the recommendations of this study can rekindle student interest.
- ii) Creating a bachelor's degree in science with forestry major AND simultaneously linking this program with technical training now offered in the forest resources technology program at the College of the North Atlantic. Such a program might meet industry and government needs for well-educated and technically competent graduates. ALL education and training would take place in our province, making it appealing to potential students.
- iii) Creating a master's degree in forestry, not unlike the University of Toronto's MF program, which would allow graduates from most undergraduate science degrees - not just forestry related degrees - to enroll. Logically, this program would be linked to the College of the North Atlantic, which might lease the necessary technical expertise and facilities to this program and decrease the heavy facility and capital equipment costs to the university. The presence of the Canadian Forest Service, the provincial Department of Natural Resources, Corner Brook Pulp and Paper and the College of the North Atlantic in Corner Brook provides a bank of highly skilled potential teachers for this program, as well as for the B.Sc.(forestry major) program proposed in (ii) above.
- iv) As the university develops its future directions, it should strongly consider actively participating in any and all efforts resulting from the recommendations from this study. The university is stuck in a bit of a "chicken/egg" dilemma, recognizing the need for students to enroll in forestry education programs but having little to offer immediately if recruitment efforts are successful.

INDUSTRY AND GOVERNMENT

4) Both of our province's two pulp and paper companies, their contractors, our provincial Department of Natural Resources, the federal Canadian Forest Service, other forest-based industries, NGOs, and academic institutions hire foresters at both the degree and diploma levels, and all have a stake in the future supply of such professionals. But the primary employers continue to be industry and both levels of government. Indications are there will be significant retirement in the next few years, possibly coupled with more jobs being created as the result of more effort at sustainable forest management in our province. A lack of qualified employees can cause significant disruption to work plans. Thus:

- i) Senior administrators at all interested groups need to recognize the potential problems inherent in a poor supply of well-educated forestry professionals (and the very real possibility no forestry

training whatsoever will be available in our province) and thus agree to participate fully in any and all remedial efforts recommended by this study by committing significant funds and human resources to these projects.

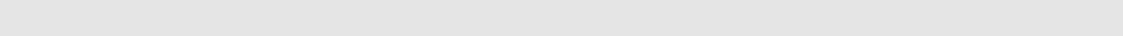
- ii) In the short term, all hiring groups need to start identifying present and future needs (including succession planning) and in so doing, make more opportunities for both paid summer internships and return-of-service contracts available to young forestry students to make employment prospects more appealing, the experience more relevant, and financing their studies more affordable.
- iii) Increase efforts to promote the role of forestry professionals and the work they do by highlighting the positive nature of their work, their use of high-end technology, and the long-term viability of and satisfaction with the profession. This can be achieved both by using in-house methods currently employed and by participating fully in the recommendations of this study.
- iv) Generally, all parties need to address, by whatever means available, the poor image of the forest products industry in our province.

PROFESSIONAL ORGANIZATIONS...THE CANADIAN INSTITUTE OF FORESTRY (CIF)

5) Most foresters belong to a professional association, most commonly, the Canadian Institute of Forestry. This organization has taken a leading role in developing and implementing this study and provides significant levels of support to its membership through continuing education, professional development and as an advocate for the profession and its membership. This organization recognizes the recruitment problems throughout Canada. The writer believes the CIF can be a leading partner in addressing the problems and recommends the following as possible future directions for the provincial chapter:

- i) Promoting the role of the professional forester through whatever public media can be accessed in whatever way it can: highlighting sound sustainable forest management practices, the use of technology in the workplace, career satisfaction and the like.
- ii) Encouraging its membership to be as active as possible in all school-related activities ranging from career fairs, school curriculum development, speaking engagements, forest tour guides - anything that puts forward the positive image of its members' practices and their use of science and technology in their jobs.

iii) Participating as an active member in whatever recommendations are implemented from this study. This might be by contributing financial and human resources, professional liaison with its local membership and national organization, and acting as a lead partner in all attempts to apply for funding for future activities related to the next phases of the project.



TOWARD A SOLUTION TO THE PROBLEM

There are significant and multiple challenges facing all of us who care about the future of the forests in Newfoundland and Labrador. This study has identified them and made recommendations to address them. Now we all are faced with the need, sooner than later, to do something about it so our forests will continue to provide every one who uses this natural resource with a viable, sustainably managed resource that provides for all our needs - economic, recreational and cultural - well into the future.

The following is a studied suggestion as to just how we might accomplish this. There are, I am sure, other alternatives and in the weeks and months to follow the writer hopes there will be substantial debate over the future courses of action. But time is not really on our side, particularly for forestry professionals and the people who hire them. Swift and concrete action must occur while the ongoing debate is carried out.

The following is an outline of what this writer believes might be ONE viable way to proceed for the immediate future:

- i) Create a secretariat to start the process of applying for funds from all available sources to develop a strategy that addresses the problems identified in the study. Initially this may be funded by partners such as the two levels of government, industry, and the institutions of higher education.
- ii) House this secretariat at the Western Newfoundland Model Forest to be supported by this organization in its initial set-up stages. Financing for this stage of the operation can be through a combination of in-kind contributions for such areas as secretarial/administrative assistance from the Model Forest, an office from SWGC, and salary and travel costs from the Model Forest and its partners.
- iii) One full-time employee would be needed initially until the search for funding is complete and obtained.
- iv) Once this initial process is successfully completed, substantial resources can then be relied upon to develop and institute a master plan to address the entire series of issues the study identifies.
- v) Revenue might be obtained from some or all of the following sources: the federal government through HRSDC, ACOA and possibly other agencies and programs; the provincial government through various sources including the Department of Natural Resources. It would also be likely other partners, and particularly industry, will contribute in a substantial way. The study document itself will provide the background support

necessary for funding agencies. This process should only be as long as the time it takes to complete application forms, make appropriate presentations, and hold meetings. It seems highly likely government and industry partners will expedite and assist in this process to the best of their abilities.

vi) Ultimately, the writer believes a two-year process should be undertaken, starting as soon as funding is obtained. The secretariat can then be expanded with the addition of contracted specialists who will be charged with developing such resources as school materials, a dedicated career-based web site, brochures, and other material guidance counselors or educators may require. Information must also be developed for college and university recruiters and forestry professionals so they may begin a substantial recruitment campaign for students. Financial resources will be needed to develop and produce this material. In addition to resource development, development, the following duties should be considered appropriate:

- a) Create a clearing house for all requests from schools and other groups for information, guest speakers, tours, etc. throughout the province.
- b) Provide a consultative service for all partners in promoting forestry as a career in our province.
- c) Conduct research for partners on various issues with respect to training and education.
- d) Conduct on-going research and evaluation of the process as it proceeds and make recommendations to improve the process as needed.
- e) Encourage on-going promotion through media and by other methods of the functions of the secretariat and its mandate.
- f) Organize opportunities to promote forestry education issues such as conferences or seminars, and organize and implement a speakers' bureau to respond to requests for information. An annual forestry fair traveling across the province might be a viable contributor to the process.

vii) The main proponent of this process should be the Canadian Institute of Foresters in cooperation with the Western Newfoundland Model Forest and all its partners. The secretariat should be housed in Corner Brook and ideally at the Forestry Center at Sir Wilfred Grenfell College with administrative support from both the Model Forest and the SWGC.

viii) A management/advisory committee should be appointed to oversee secretariat operations. Rather than adding more duties to the partners, this may be the same management group that oversees Model Forest activities.

NEED FOR FURTHER RESEARCH

The study identified many problems with the state of forestry education in our province. These have been outlined fully in the main body of the report and in the recommendations for further action. However, the researcher feels that many of the solutions posed still need some basic research performed on them to ensure that whatever actions are taken are based on the best information available. In short, the study identified some “broad Stroke” solutions but now it is appropriate for us to study some aspects of the results in greater detail and with these findings, to make recommendations that are specific and measurable.

1) POST-SECONDARY ISSUES

What are the specific skills needed to be taught in training programs in Newfoundland and Labrador to meet employers needs?

Are existing employers satisfied with the quality of new graduates from these programs? Are their new employees presenting appropriate skills?

Do existing curricula at the College of the North Atlantic and at UNB in particular meet employer needs?

Will concepts being developed for a forestry related program at Sir Wilfred Grenfell College meet employer needs?

2) K TO12 CLASSROOM ISSUES

What changes are necessary in our K to 12 school curriculum to address the problems identified?

How do we “turn on” young people to consider forestry activities in a better light? What is it that the forestry community is saying, or not saying, that is so negatively affecting attitudes?

What teaching objectives need to be developed to meet the goals inherent in creating a positive attitude?

What grade levels do we need to focus on to ensure maximum learning outcomes and attitude shift?

What kinds of activities, tools and in-service methods need to be developed to ensure teaching objectives are more easily met?

3) GUIDANCE ISSUES

How do we meet the needs of guidance counselors for up-to-date and relevant information on the potential of the forest industry for career opportunities for their students?

What tools, activities and in-service methods would be most appropriate for use in the guidance office?

From whom should this information come to make it appear objective: industry, government, professional associations?

4) FORESTRY PROFESSIONALS' ISSUES

How do we use the forestry community to best advantage in education, public relations and in the in-servicing of teaching/counseling professionals?

What skills, activities and tools do forestry professionals need to have to effectively deliver their messages?

How are they best trained in these skills and activities?

What are the most effective recruitment tools to help stem the tide away from forestry training and careers?

5) INDUSTRY AND GOVERNMENT AND OTHER EMPLOYER ISSUES

What precisely are the skills needed by employers? Are they getting what they want from new graduates?

What are the expected job /skills shortages expected for the future by employers?

If there is a shortage of new professional graduates are there other ways for employers to get the skilled workers they require? Is there any way current non-forest workers can be retrained to fill vacancies.

Has the use of Prior Learning Assessment been examined? Is continuing education needed for existing employees?

6) PUBLIC ISSUES

How can negative attitudes be changed towards a more positive view of forestry and forest careers?

How can such institutions as the CIF, the Western Newfoundland Model Forest, the colleges and universities affect public attitude change? And what resources do they need?

How can industry and government help affect public attitude change? And what resources do they need?

7) REPLICATION RESEARCH

When the recommendations from Phase One have been implemented, it is important to ensure they have been affective in meeting the goals of increased enrolment and positive public attitude change.

What changes have occurred in students' attitudes towards forestry and forest careers?

Are more students choosing forestry careers as a first career choice?

Are guidance counselors more positive toward forestry and forest careers? Have their needs been met for better information?

Are members of the CIF more positive towards their profession and the public's perception of it?

THE QUESTIONNAIRES

- 1) High School Students
- 2) Professional Foresters
- 3) Guidance Counselors
- 4) Natural Resources Students at the CNA

1. HIGH SCHOOL STUDENTS

OUR FORESTS AND CAREERS: FALL 2004

Thank you for agreeing to complete this questionnaire on the state of forestry education and training in Newfoundland and Labrador. The results of this survey will be used by forestry educators, government and industry to help them plan programs for the future.

This questionnaire should only take you a few minutes to complete but we hope you will give each answer serious consideration. Your views are very important to us as you are the future beneficiaries of our forests and their proper management.

You do not need to sign your name to this survey but we would appreciate some biographical information about you. These questions will be asked at the end of this survey and we would appreciate your completing each question accurately.

All the following questions concern your choice of a career following your high school completion. Please circle Yes or No

Questions

| | | |
|---|---|---|
| 1) I would be interested in learning more about careers in the forest sector | Y | N |
| 2) I have already decided to pursue a career in forestry | Y | N |
| 3) I know about careers in the forest sector already and have decided not to pursue any of them | Y | N |
| 4) I am planning to go to a program at College of the North Atlantic | Y | N |
| 5) I am planning to go to a program at a private college | Y | N |
| 6) I am planning to go to university at Grenfell College | Y | N |
| 7) I am planning to go to university at MUN, St. John's | Y | N |
| 8) I am planning to go to university outside Newfoundland and Labrador | Y | N |
| 9) I am undecided about what to do | Y | N |

10) The following questions ask for your opinion on various forestry and forestry education issues. Please circle the answers as they reflect your

opinion using the following scale. Remember, even if you don't really know the answer, its your impression or understanding that counts.

- 4. STRONGLY AGREE**
3. SOMEWHAT AGREE
2. SOMEWHAT DISAGREE
1. STRONGLY DISAGREE

| Questions | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| A) Jobs in forestry pay better than other professional jobs requiring the same level of education. | | | | |
| B) Forestry education requires courses in science and math. | | | | |
| C) Forestry as a profession is concerned about environmental issues. | | | | |
| D) There are jobs available for foresters and forest technicians in Newfoundland and Labrador. | | | | |
| E) I have learned about the forest industry in Newfoundland and Labrador in a school course. | | | | |
| F) Forestry has equal opportunities for both men and women | | | | |
| G) The forest industry is very economically important in our province. | | | | |
| H) The work can be physically demanding. | | | | |
| I) There are as many job opportunities in forestry as in the Information Technology (IT) industry in our province | | | | |
| J) Forestry has a poor image in the media | | | | |
| K) The forest industry has a strong future in our province. | | | | |
| L) Foresters work outdoors most of the time. | | | | |
| M) I have a good understanding of forestry career opportunities in Newfoundland and Labrador. | | | | |

Thank you for that information. Now we would like to know more about YOU. These questions ask you to “fill in the blanks” or circle the answer

11) Do you know anyone who works in any aspect of the forest sector?
Y N

12) If Yes, what does he/she do? _____

13) What do you intend to do following high school completion? _____

14) Are you considering or have you considered any of the following careers?

- a degree/diploma in forestry/forest technology
Y N
- a degree/diploma in environmental science
Y N
- a degree in pure or applied science e.g. biology, engineering
Y N

15) Are you sure you are taking all the necessary courses that admit you to both college and university.

Y N

16) In your recollection, have you ever met anyone representing the forest sector at a career fair or similar event.

Y N

17) What grade are you in now? _____

18) Are you male or female?

M F

18) What community do you live in? _____

18) Here is one final question for you. What has helped you form your opinions on the forest industry in our province? Please check the three (3) most important to you.

- Radio/Television _____
- Newspaper _____
- Environmental groups e.g the Sierra Club, Green Peace _____
- Friends/family who work in the forest industry _____
- Western Newfoundland Model Forest program _____
- School teacher/guidance counselor _____
- Parents _____
- School course e.g. environment science/biology _____
- Industry sponsored program e.g a mill or woodlands tour _____
- Other (Please specify) _____

That's it! Thanks to you and your school for agreeing to participate in this survey!

This research is made possible by a grant from Human Resources and Skills Development Canada, is sponsored by the Canadian Institute of Foresters and the Western Newfoundland Model Forest and is supported by

Natural Resources Canada/The Canadian Forest Service, The Government of Newfoundland and Labrador's Department of Natural Resources, Corner Brook Pulp and Paper, Abitibi Consolidated, The Humber Economic Development Board, Sir Wilfred Grenfell College and the College of the North Atlantic.

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2. SURVEY OF THE MEMBERSHIP OF THE CANADIAN INSTITUTE OF FORESTRY

I am conducting research on the state of forestry education and training in Canada, and specifically in Newfoundland and Labrador, to try to determine why enrolment in forestry education programs throughout Canada and specifically in Newfoundland and Labrador is declining. This research is sponsored by the Canadian Institute of Foresters and the Western Newfoundland Model Forest.

The decline appears to be happening in spite of statistical information that would indicate a reasonable future for employment for graduates of both degree and diploma programs. When this information is coupled with an anticipated higher than usual retirement rate expected within the next 5 to 8 years, our country might actually expect an under-supply of foresters and forest technicians that could affect the development and implementation of forest related activities by both industry and government.

I am anxious to get the opinions of forestry professionals currently practicing in our province as to why this is happening and what we as a province might be able to do about the situation, at least within our own jurisdiction.

Thus I am hoping you might take a few minutes of your time and fill out this on-line survey. Just open the attachment and key your answers in the spaces provided and then send it back to me by return email.

The last question asks for your opinion as to what government, industry and the professional associations might be able to do to encourage more young people to think about forestry careers as their first choice and I would very much like to be able to quote you from this question in my research. If, however, you do not wish to be quoted, simply say so after you have written your piece and I will totally respect your desire for anonymity.

The answers to the other questions will be analyzed statistically and answers will be presented as group data only.

THIS RESEARCH IS MADE POSSIBLE BY A GRANT FROM HUMAN RESOURCES AND SKILLS DEVELOPMENT CANADA, IS SPONSORED BY THE CANADIAN INSTITUTE OF FORESTERS AND THE WESTERN NEWFOUNDLAND MODEL FOREST AND IS SUPPORTED BY NRCAN/CFS, THE GOVERNMENT OF NEWFOUNDLAND AND LABRADOR'S DEPARTMENT OF NATURAL RESOURCES, CORNER BROOK PULP AND PAPER, ABITIBI CONSOLIDATED, THE HUMBER ECONOMIC DEVELOPMENT BOARD, SIR WILFRED GRENFELL COLLEGE AND THE COLLEGE OF THE NORTH ATLANTIC

The survey follows:

PLEASE KEY YOUR NUMBERED RESPONSE IN THE SPACE PROVIDED BY DELETING THE OTHER NUMBERS AND KEY IN YOUR WRITTEN RESPONSE AFTER EACH QUESTION AND REPLY EMAIL BACK TO ME.

Please use the following scale for questions 1 to 11:

- 1....STRONGLY AGREE**
2....SOMEWHAT AGREE
3....SOMEWHAT DISAGREE
4....STRONGLY DISAGREE

| Questions | 1 | 2 | 3 | 4 |
|--|---|---|---|---|
| 1) Young people are not choosing forestry as a profession because they perceive the forest industry as having a poor future in our province. | | | | |
| 2) The average pay in the forest professions is above that paid for similar training and experience in the IT industry. | | | | |
| 3) Forest practice is seen by students as environmentally insensitive. | | | | |
| 4) Many students now live in an urban environment and don't have any connection with foresters or the forest industry. | | | | |
| 5) Students don't get appropriate career information about forestry. | | | | |
| 6) Much forest practice now involves the implementation of multiple value approach to management. | | | | |
| 7) The media are generally very helpful in giving good coverage to forestry in our province. | | | | |
| 8) Teachers and guidance counselors recognize the value of our forests to our economic prosperity. | | | | |
| 9) Government, industry and professional groups need to do more to encourage forestry careers among students. | | | | |
| 10) Forestry careers are perceived as more suitable for males than for females. | | | | |
| 11) Students are "put-off" the study of forestry at any level because of the need to do advanced math. | | | | |
| Essay Questions | | | | |
| 12) Research suggests that students are choosing environmental studies | | | | |

options more than forestry options at the post-secondary level. Why do you think this might be so? (Please key your response here and take as much space as you want!).

13) What do you think needs to be done by industry, government and other interested groups to reverse the trend away from the study of forestry as a first choice career option? (Please key your response here)

14) Are there any other comments you would like to make? (Please key in your response here)

I PREFER MY ANSWERS BE KEPT ANONYMOUS
(KEY YES OR NO)

or

PLEASE QUOTE ME ALL YOU WANT!
(KEY YES OR NO)

Your name:

Title:

Telephone number:

If you have problems doing this online please find another way of completing it, either by printing it off and completing it by hand and mailing or faxing it to me, as per the info below.

THANKS AGAIN FOR DOING THIS! ANY QUESTIONS OR
COMMENTS PLEASE CONTACT ME

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fax: 709-634-0255

email: dsmallwood@swgc.mun.ca

3. SURVEY OF NEWFOUNDLAND AND LABRADOR GUIDANCE COUNSELORS AND GUIDANCE TEACHERS

I am conducting research on the state of forestry education and training in Canada, and specifically in Newfoundland and Labrador, to try to determine why enrolment in forestry education programs throughout Canada and specifically in Newfoundland and Labrador is declining. This research is sponsored by the Canadian Institute of Foresters and the Western Newfoundland Model Forest.

The decline appears to be happening in spite of statistical information that would indicate a reasonable future for employment for graduates of both degree and diploma programs. When this information is coupled with an anticipated higher than usual retirement rate expected within the next 5 to 8 years, our country might actually expect an under-supply of foresters and forest technicians that could affect the development and implementation of forest related activities by both industry and government.

I am anxious to get the opinions of counselors and guidance teachers currently practicing in our province as to why this is happening and what we as a province might be able to do about the situation, at least within our own jurisdiction.

Thus I am hoping you might take a few minutes of your time and fill out this on-line survey. Just open the attachment and key your answers in the spaces provided and then send it back to me by return email.

The last question asks for your opinion as to what government, industry and the professional associations might be able to do to encourage more young people to think about forestry careers as their first choice and I would very much like to be able to quote you from this question in my research. If, however, you do not wish to be quoted, simply say so after you have written your piece and I will totally respect your desire for anonymity.

The answers to the other questions will be analyzed statistically and answers will be presented as group data only.

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DEVELOPMENT BOARD, SIR WILFRED GRENFELL COLLEGE
AND THE COLLEGE OF THE NORTH ATLANTIC.

The survey follows:

PLEASE KEY YOUR NUMBERED RESPONSE IN THE SPACE PROVIDED BY DELETING THE OTHER NUMBERS AND KEY IN YOUR WRITTEN RESPONSE AFTER EACH QUESTION AND REPLY EMAIL BACK TO ME.

Please use the following scale for questions 1 to 11:

| |
|---|
| <p>1....STRONGLY AGREE 2....SOMEWHAT AGREE 3....SOMEWHAT DISAGREE 4....STRONGLY DISAGREE</p> |
|---|

| Questions | 1 | 2 | 3 | 4 |
|--|---|---|---|---|
| 1) Young people are not choosing forestry as a profession because they perceive the forest industry as having a poor future in our province. | | | | |
| 2) The average pay in the forest professions is above that paid for similar training and experience in the IT industry. | | | | |
| 3) Forest practice is seen by students as environmentally insensitive. | | | | |
| 4) Many students now live in an urban environment and don't have any connection with foresters or the forest industry. | | | | |
| 5) Students don't get appropriate career information about forestry. | | | | |
| 6) Much forest practice now involves the implementation of multiple value approach to management. | | | | |
| 7) The media are generally very helpful in giving good coverage to forestry in our province. | | | | |
| 8) Teachers and guidance counselors recognize the value of our forests to our economic prosperity. | | | | |
| 9) Government, industry and professional groups need to do more to encourage forestry careers among students. | | | | |
| 10) Forestry careers are perceived as more suitable for males than for females. | | | | |

| | | | | |
|--|--|--|--|--|
| 11) Students are “put-off” the study of forestry at any level because of the need to do advanced math. | | | | |
|--|--|--|--|--|

Essay Questions

12) Research suggests that students are choosing environmental studies options more than forestry options at the post-secondary level. Why do you think this might be so? (Please key your response here and take as much space as you want!).

13) What do you think needs to be done by industry, government and other interested groups to reverse the trend away from the study of forestry as a first choice career option? (Please key your response here)

14) Are there any other comments you would like to make?
(Please key in your response here)

I PREFER MY ANSWERS BE KEPT ANONYMOUS
(KEY YES OR NO)

or
PLEASE QUOTE ME ALL YOU WANT!
(KEY YES OR NO)

Your name:

Title:

Telephone number:

If you have problems doing this online please find another way of completing it, either by printing it off and completing it by hand and mailing or faxing it to me, as per the information below.

THANKS AGAIN FOR DOING THIS! ANY QUESTIONS OR COMMENTS PLEASE CONTACT ME

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4. CAREERS IN FORESTRY PROJECT

Dear student,

As part of my research to try to determine why young Newfoundlanders and Labradorians are not choosing to study forestry at either the degree or diploma levels in nearly the same numbers as ever before, I am asking you, as a Forest Technology student to help.

Simply, I want you to answer the question below.

The answers should reflect your own personal feelings about this issue, as I am not trying to reach consensus but rather to get as many reasons as I can find.

Please answer on this page and use the back if you need to. Your instructor will collect them from you and return them to me for analysis. Your answers will be kept confidential and your name will not be used in the report.

Thanks you for your help and I hope the results of this project might be able to address a problem that could have lasting negative influences on the industries and people that depend on the use of a well managed forest in our province.

Thanks
David Smallwood, Phd.
Researcher

What are the FIVE most important reasons, in your view, why students are NOT choosing forestry as their first career choice?

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