PLANNING DECISIONS
Research & Planning

Aroostook County Economic Cluster Report
Part 1: Analysis

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Executive Summary

Cluster analysis is a way of looking at economic sectors in a comprehensive way. It looks not just at how individual businesses in, say, agriculture or wood products, are doing, but also at the overall environment that supports such businesses -- the suppliers, workers, educational institutions, wholesalers, end users, government regulators. The goal of this analysis is to develop recommendations to improve Aroostook County's key economic sectors.

Aroostook County is unusually dependent on several sectors, including natural resources industries, transportation, health care/social services, and government. The former are traditional Aroostook mainstays. The latter are reflections of the aging of the County's population.

For this analysis, after interviewing economic developers and reviewing the data, five existing and potential economic clusters were selected for review. They were selected based upon their importance in the regional economy and their potential for generating job growth in the future. The clusters include forest products, agriculture, tourism, information technology, and precision manufacturing.

The forest products industry cluster employs 3,500 workers in Aroostook County in timber harvesting, lumber and paper mills, biomass plants, trucking and railroad transport, and equipment and chemical supplies. These workers are part of a larger New England – Canadian forest industry cluster, the largest in the region. For a variety of reasons, the industry is at a down point in its economic cycle, and the longer the down cycle lasts, the more businesses shrink and in some cases close. The cause of the paper industry's troubles are weak overall demand and international competition. The lumber industry is in the midst of a housing boom -- high demand -- but low cost competition, largely from Canada, is squeezing local mills. The two bright spots in the picture are specialized products, such as hardwood veneer production; panel products, such as oriented strand board; and cedar wood products. The industry cluster would be helped in the short term by cost relief, and in the longer term by strengthening the rail system and diversifying new products and markets.

The agriculture cluster employs 3,000 Aroostook residents on farms, in equipment and chemical supplies, in wholesaling and transportation, in food processing, and the like. About three quarters of the production is potatoes. The rest is in vegetables such as broccoli and oats, and livestock such as beef and poultry. Key strategies for future success include strengthening the competitive position of the potato cluster by increasing irrigation and adding new potato processors, and diversifying the farm industry by increasing the production of organic products and beef.

The tourism cluster consists of thousands of people who: (1) create or enhance attractions (such as snowmobile clubs and festival organizers); (2) provide lodging; (3) provide food (restaurants); and (4) provide stores and services supporting tourists (crafts, the Mall, fishing gear suppliers, etc.). There are about a half million pleasure trips taken to Aroostook County each year. Over half come for outdoor activities, including snowmobiling and cross country skiing in the winter, and bicycling and fishing and hunting in the summer and fall. Possible strategies for increasing tourism include developing new destination attractions; cross marketing to existing tourists to come back other seasons; drawing tourists from nearby streams in New Brunswick (heading from the cities to the coast) and in Bar Harbor (coming up from Massachusetts); and encouraging existing tourists to lengthen their stays. The upcoming World Cup Biathlon in 2004, which will draw 5,000 visitors to the County, offers an important opportunity for cross-marketing. Aroostook County Tourism is an effective regional group, but it needs to become stronger in order to market effectively against competitors in New Brunswick and at Maine's traditional resorts.

The information technology (IT) cluster consists of businesses that are involved with computer software and web design, database management, internet services, and (potentially) data backup and disaster recovery services. These businesses typically pay twice the average salary in the region, and have the potential to be the County's #1 growth industry in the next decade. ATX in Caribou (producing tax software), Burrelle's in Presque Isle (information services), and the Maine Mutual Group (IT base for regional insurance operation), are three leaders in the local industry. Aroostook County has excellent access to high-speed internet services, redundant broadband pathways for internet-dependent businesses, and three institutions of higher education, all of which are essential infrastructure for IT. But the County lacks in-depth research and development in the field, and networking opportunities for local professionals. To build this industry, the availability of redundant internet capacity should be marketed to the outside world (especially those involved in data backup and emergency services); local hospitals and banks and schools should be encouraged to upgrade with local business providers; the three colleges should build up their IT research and training; and industry networking opportunities should be expanded.

Precision manufacturing of metal products is a small but important activity in Aroostook County. Acme-Monaco in Presque Isle, First Technology in Caribou, and Smith and Wesson in Houlton are key companies, as are and other local metals fabricators serving the agriculture and wood products industries. While this is not enough to comprise a "cluster," there are also a number of large metals firms just across the border in New Brunswick that increase the market for developing needed industry supports. Of particular importance is the expansion of the metals technology program at the Northern Maine Community College as a potential source for well-trained (and well-paid) employees for growing the metals industry throughout the region.

There are common themes that run across all of these cluster discussions.

First, New Brunswick is a resource for Aroostook County's economic growth. Traditionally Canada is seen as a low cost (and sometimes unfairly advantaged) competitor, and this tension will always exist and must always be managed. But the analysis in this report also shows that, in many cases, cooperation with New Brunswick can help businesses on both sides of the border. For Aroostook County specifically, New Brunswick is a source of investment in forestry (Irving, Nexfor-Fraser); investment in agriculture (McCain's); potential tourists; and of infrastructure for metals and IT. Creating institutions to extend cross border economic cooperation is important to Aroostook's future growth. Frequent contact and shared projects between Aroostook and New Brunswick industry and government will likely produce dividends for all Aroostook industries.

Second, the nascent information technology industry is important in its own right, but is also important for the success of other sectors in the region. Tourism is moving to the internet; Aroostook County tourist promoters need to use the tool as effectively as is done in New Brunswick. Traditional industries such as wood products and agriculture now depend upon state-of-the-art communications and control systems to stay ahead of the market. By growing the information technology cluster, Aroostook County businesses can be helped across the board.

Third, the fact that the County has three institutions of higher education is a great asset. In the first place, the three schools attract people to come and live in Aroostook County from beyond its borders. Secondly, the schools can provide the trained workforce needed to compete in a high-technology economy. Finally, by contributing to the overall quality of life and cultural opportunities in the area, the schools help attract and keep talented people.

Finally, transportation is an important issue across the board. Frequent and reliable air service is essential to businesses who must serve and be in constant communication with national markets – including information technology companies, manufacturing firms, and producers of agricultural and forest products. Air service, in the long run, will also help the tourism industry. Rail service is important to the natural resources base of the County, particularly forest products. Unlike the other three items listed above -- New Brunswick, IT, and higher education -- this is an area of weakness for the region that must be strengthened.

This is the first report of two. In the next report we will take these findings and translate them into a marketing and action plan.

Introduction

Aroostook County is unique among counties in Maine, not only for its size but for the character of its economy. The County is first in the state in agricultural output, and near the top in forest products. It also has an increasingly diverse economy that no longer relies heavily on defense spending but includes hundreds of service and technology businesses, and has a growing four-season tourism economy.

Still the County, like other rural areas across the United States, faces serious economic challenges. Traditional sectors such as forest products and agriculture face stiff competition and squeezed profit margins. New technology businesses, and older businesses incorporating the latest technology, face the challenge of recruiting, training, and retaining skilled workers; and of competing in far-off markets that are changing by the hour. This report addresses the challenges facing five key industries in Aroostook County through a technique known as "cluster analysis."

Cluster analysis

A cluster analysis is a particular kind of economic analysis that focuses on the overall environment and setting for a specific sector. In other words, instead of focusing only on the individual business within a sector, it focuses on the availability and quality of inputs available to that business, the downstream markets it can tap and the interactions among businesses within the sector. Or to be more concrete, we look not only at the potato farmer, but also at the availability of water and fertilizers, the condition of the workforce, the availability of food processing markets and ways farmers

Recognizing a cluster

Industry clusters have become a popular concept in the last few years, and simple concentrations of industry are often called clusters even when they don't function as such. Generally regional clusters can be recognized by several attributes that provide important competitive advantages to the cluster:

- Large scale, involving numerous companies within a single industry or several closely related industries,
- Strong presence in regional , national or international markets,
- Well developed industry infrastructure, which can include major companies, plants or facilities, supporting industries, suppliers, transportation networks, etc
- A large well trained labor force with specialized skills that provide competitive advantages to the region,
- Supporting institutions, including educational institutions, research facilities, extension services, and trade associations that actively strengthen the industry and make it more competitive,
- Strong networks and in-depth industry knowledge within the industry, supporting institutions and related professional industries such as law firms, accounting firms, insurance companies, and financial institutions.

Industry clusters with these attributes are also characterized by high degrees of innovation, with new products, processes or services being introduced at a relatively rapid rate. Competition between firms within the cluster is high, with the result that these firms are more competitive in larger national and global markets.

interact that strengthen the overall agricultural sector as a whole.

The advantage of this approach is that it gives a broader framework for understanding what economic development actions need to be taken. By viewing individual businesses from the perspective of their clusters (or absence of a cluster) economic developers can better judge the overall impact of assistance given to one business compared to another. In addition, they can evaluate the relative impact of broad sectoral assistance compared to individual business assistance. It may not be the best use of development resources to help individual businesses with low interest loans and grants if the supporting infrastructure of education, transportation, and communications are not available and appropriate for its activity. This is an increasingly popular kind of economic analysis around the country. In this report we apply it to Aroostook County.

The benefits of clustering

Research has shown that traditional industries such as forest products and agriculture benefit significantly from the clustering of suppliers, resources and industrial infrastructure, while new industry clusters such as information technology derive significant advantages from the concentration of skilled personnel and knowledge. These and other factors affecting cluster function here in Maine have already been analyzed for several of Maine's strategic industries (Colgan and Baker, 2002).

Here are some of the things these earlier reports have found. The state's forest products industry, running from York County to Aroostook County, shows the strongest cluster characteristics, with dozens of large paper and lumber mills and attending support industries. This is followed closely by agriculture, which shows its primary cluster strength in Aroostook County but is also important in other regions of Maine. The remaining technology sectors do not display strong cluster tendencies at present – in other words, they lack a rich set of support structures (see enclosed box on the previous page) -- but some, such as information technology, have considerable potential to do so in the future.

The regions for clusters

Identifying clusters and developing strategies to strengthen them at a regional level poses several challenges. Some clusters such as forest products operate at a much larger level than a local region, extending from New Hampshire across Maine and into Quebec and New Brunswick. Other clusters, such as Maine's potato industry, operate at a regional level, encompassing all of Aroostook County and parts of New Brunswick. Tourism in Maine is heavily concentrated along the coast but has expanded rapidly in other parts of the state in recent years, including Aroostook County.

This means that recommendations flowing from this analysis in some cases must address statewide organizations or, in this case, New Brunswick businesses and governments.

The selection of clusters

Clusters were selected for this study according to two criteria: first, the current importance of the sector to Aroostook's economy, and second, the potential contribution of the sector to the future economy of Aroostook County.

To make the selection, the consultants reviewed economic data for the County, examined industry lists from Tower Reports, read past economic reports, conducted interviews with 17 local officials[1], and went over the results in a meeting with Northern Maine Development Commission experts. From this process five industries were selected for analysis, including forest products, agriculture, tourism, information technology (including data storage and backup), and precision manufacturing. This list includes both the County's traditional industries as well as promising new growth industries.

The research process

Following the selection of key clusters, the consultant team conducted interviews with key people from innovative and strategic companies or organizations in each cluster; reviewed available data and reports; consulted with outside experts on the cluster; reviewed preliminary findings with Northern Maine Development Commission staff; and produced this report.

Marketing

This report represents the analytical phase of the study. There will be a short Part 2 report addressing the marketing strategy needed to accomplish the key recommendations in this report.

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[1] Charles Ames –Houlton Center, University of Maine at Presque Isle
Larry Clark – Presque Isle Development Council
Richard Cost – University of Maine at Fort Kent
Tim Crowley, Pat Sutherland – Northern Maine Community College
Peggy Daigle, Don Keiser – Town of Houlton
Walt Elish – Maine Public Service
Arthur Faucher – Town of Madawaska
Brian Flewelling – Key Bank
Brian Hamel – Loring Development Authority
Ken Harding – Town of Woodstock, New Brunswick
Nancy Hensel – President, University of Maine at Presque Isle
Jon McLaughlin – Southern Aroostook Development Corporation
Gary Mellanson – Enterprise Carleton, New Brunswick
Ed Nickerson – Loring Applied Technology Center
Gordon Roach – Southwest Valley Development Corporation, New Brunswick
Charles Upton – Upper Valley Economic Council
Donald Guimond – Town of Fort Kent

Overview of the Aroostook County Economy

Prior to exploring individual clusters, it is useful to review the overall economic environment of Aroostook County. Aroostook is the largest county east of the Mississippi, larger than the states of Connecticut and Rhode Island combined. Its economy is characterized by two central facts:

- ✓ a heavy dependence on natural resource based manufacturing, including its associated support structure, and
- ✓ an aging population that has created a service economy dependent on transfer payments.

In Aroostook County, over 80% of manufacturing income and employment derive from three industries—paper, wood products and food processing.[2] For the U.S. as a whole, only 13% of manufacturing income and employment derive from these three. Aroostook is thus highly specialized in and dependent upon these industries. In fact, combining these sectors with their associated industries of agriculture, truck transportation, gasoline stations and repair services creates a cluster of businesses that provide fully 28% of all earnings in Aroostook County – in contrast to a national average of 5% (see Table 1).

Table 1
Sources of Earnings by Selected Sector, Aroostook County and U.S. 2001

Sector/item	Earnings by industry ($1,000)	Share of earnings Aroostook	Share of earnings U.S.	Aroostook/ US comparison
Farm earnings	**$ 24,959**	**2.5%**	**0.6%**	**389.5%**
Nonfarm earnings	$ 973,310	97.5%	99.4%	98.1%
Private earnings	$ 747,432	74.9%	83.4%	89.8%
Fishing, hunting, and trapping	**$ 4,693**	**0.5%**	**0.0%**	**2025.8%**
Agriculture and forestry	**$ 3,889**	**0.4%**	**0.2%**	**230.7%**
Utilities	$ 1,963	0.2%	1.1%	18.4%
Construction	$ 38,359	3.8%	6.3%	61.2%
Manufacturing	**$ 162,160**	**16.2%**	**13.3%**	**122.2%**
Wood product manufacturing	**$ 44,059**	**4.4%**	**0.3%**	**1365.6%**
Food manufacturing	**$ 28,076**	**2.8%**	**0.9%**	**300.3%**
Paper manufacturing 2	***$ 66,089 est.***	**6.6%**	**0.5%**	**1396.9%**
Wholesale trade	$ 33,133	3.3%	5.3%	63.2%
Retail trade	**$ 88,663**	**8.9%**	**6.8%**	**131.1%**
Gasoline stations	**$ 9,927**	**1.0%**	**0.3%**	**302.2%**
Transportation and warehousing	**$ 39,622**	**4.0%**	**3.3%**	**119.8%**
Rail transportation	**$ 2,787**	**0.3%**	**0.2%**	**136.6%**
Truck transportation	**$ 27,705**	**2.8%**	**1.0%**	**290.8%**
Information	$ 30,173	3.0%	4.5%	66.7%
Finance and insurance	$ 36,261	3.6%	7.4%	48.9%

[2] Employment and income for paper manufacturing in Aroostook County are not reported because there are too few firms to disclose the data. The 1997 Economic Census reported paper employment in the 1,000 to 2,499 range. While employment is certainly lower today because of known plant closings, dependence on these three sectors remains high. The earnings for paper manufacturing are estimated based on national averages of the earnings to employment ratio applied to the midpoint of estimated Aroostook employment.

Credit intermediation	**$ 24,507**	**2.5%**	**2.2%**	**110.4%**
Real estate and rental and leasing	$ 5,755	0.6%	1.8%	32.8%
Professional and technical services	$ 24,240	2.4%	9.2%	26.3%
Management of companies	$ 12,307	1.2%	2.2%	56.5%
Administrative and waste services	$ 19,577	2.0%	3.8%	51.0%
Educational services	$ 1,872	0.2%	1.2%	15.1%
Health care and social assistance	**$ 155,734**	**15.6%**	**8.8%**	**176.6%**
Ambulatory health care services	**$ 61,153**	**6.1%**	**4.2%**	**146.3%**
Hospitals	**$ 39,443**	**4.0%**	**2.8%**	**139.2%**
Nursing and residential care facilities	**$ 35,456**	**3.6%**	**1.1%**	**314.1%**
Social assistance	**$ 19,682**	**2.0%**	**0.7%**	**292.4%**
Arts, entertainment, and recreation	$ 1,760	0.2%	1.2%	15.2%
Accommodation and food services	$ 30,330	3.0%	3.2%	94.3%
Accommodation	$ 5,680	0.6%	0.8%	68.6%
Food services and drinking places	**$ 24,650**	**2.5%**	**2.4%**	**103.2%**
Repair and maintenance	**$ 15,839**	**1.6%**	**0.9%**	**170.0%**
Government and government enterprises	**$ 225,878**	**22.6%**	**15.9%**	**142.0%**
Federal, civilian	**$ 44,687**	**4.5%**	**3.0%**	**147.0%**
Military	$ 8,663	0.9%	1.3%	68.1%
State and local	**$ 172,528**	**17.3%**	**11.6%**	**148.8%**
State government	**$ 46,149**	**4.6%**	**3.3%**	**140.3%**
Local government	**$ 126,379**	**12.7%**	**8.3%**	**152.2%**

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Those sectors where Aroostook's share of earnings exceeds that of the U.S. are those with above average concentrations (they are in bold in Table 1). These are the sectors where Aroostook has some sort of competitive advantage relative to the rest of the U.S. Clearly, wood products and paper, where the Aroostook/U.S. ratio exceeds 1000% are the highest sectoral specialties. Food processing at over 300% is the next highest specialty. It is interesting to note that, at least in the 1997 Economic Census, both of these sectors also showed above average levels of productivity (productivity equals the value of output for a dollar of labor). Table 2 shows the ratios.

Table 2
Sales per Dollar of Payroll

Sector	Aroostook	U.S.	Aroostook/ US
Manufacturing	**$7.14**	**$6.72**	**106.3%**
Food	**$11.30**	**$11.00**	**102.7%**
Wood	**$6.52**	**$6.19**	**105.3%**
Paper (est)	$6.76	$6.76	100.0%

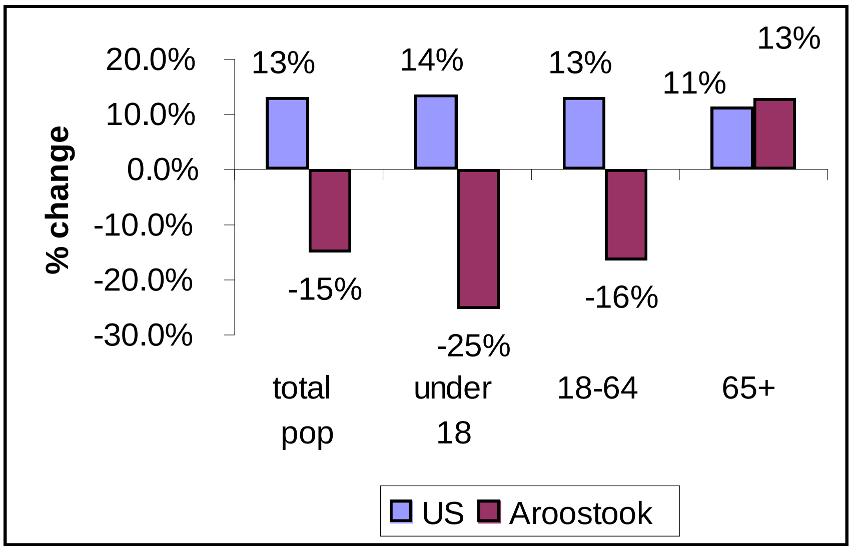
Source: U.S. Department of Commerce, 1997 Economic Census

For manufacturing as a whole and for the food and wood processing sectors, Aroostook producers were more productive in 1997 than the national average. Since paper industry data were not disclosed for Aroostook County, we used the national average to estimate sales and payroll for the employment range reported.

This productivity data highlights the dilemma facing Aroostook County. To remain competitive in the increasingly global economy, Aroostook's key industries must continually invest in new equipment. This often means replacing traditional jobs with machines and creating new, more highly technical jobs, that are generally fewer in number than the traditional jobs. In short, the core of the County's economy cannot be counted on to provide a continuing supply of new jobs for the natural growth of the labor force. That task must be accomplished by related support businesses and entirely new businesses in entirely different sectors. This point leads to the second major characteristic of the Aroostook economy.

The second key characteristic of the Aroostook County economy is its aging population.

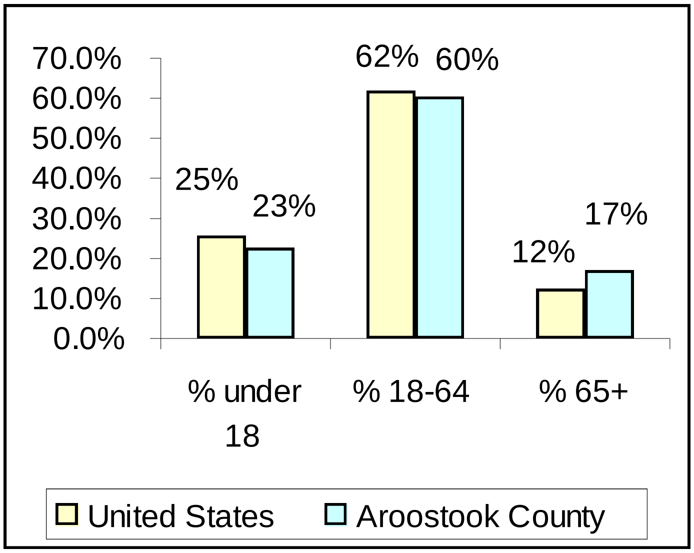
Chart 1
Population Change by Age Group, 1990 to 2000, Aroostook County and U.S.



Source: U.S. Bureau of the Census 2000 Census of Population and Housing.

While the U.S. population grew over 13% over the past decade, its largest inter-censal rate of increase since the 1950's, Aroostook County's population declined by 15%. Even more importantly, the county suffered a decrease in its working age population, an even greater decline in its future working age population (those under 18) and saw an *increase* in its elderly population that exceeded the national rate. As a result, Aroostook County's population is more heavily weighted toward the elderly and less heavily weighted to the young and working ages compared to the national average.

Chart 2
Population Distribution by Age Group, 2000, Aroostook & U.S.



Source: U.S. Bureau of the Census 2000 Census of Population and Housing.

In Aroostook County in 2000, 17% of the population was 65 or older, 37% higher than the national average of 12%. In contrast, only 23% of Aroostook's population was under age 18 compared to 25% for the nation.

Economically, there appear to be two effects of this changing demographic structure. The first is that Aroostook County gets a much larger share of its income from transfer payments than the national average.

Table 3
Share of Total Income by Source, Aroostook & U.S., 2001

Source of Income	Aroostook	U.S.	AC/US ratio
Earnings as % Personal Income	59%	68%	87%
Div, Int, Rent as % Personal Income	15%	19%	79%
Transfers as % Personal Income	**26%**	**13%**	**200%**

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Compared to the national average, people in Aroostook County get less of their incomes from earnings and property and more from transfer payments. The largest category of these transfer payments (over 42%) are medical payments. Not coincidentally, the other sector besides natural resources where Aroostook has much higher than average concentrations of income and employment is health care and social services. These sectors provided approximately $156 million in earnings to Aroostook workers in 2001.[3] As a share of total income, this was 76% greater than the national average. In addition, earnings from health and personal care stores amounted to nearly $6 million in Aroostook County in 2001. As a share of total earnings, this was 35% above the U.S. average.

[3] Bureau of Economic Analysis Local Area Personal Income, 2001.

Finally, it is interesting to note that 23% of all earnings in Aroostook County in 2001 derived from government sources. This was substantially higher than the U.S. average of 16%, and was higher for all levels of government, federal, state and local. Whether this dependence is also attributable to the County's above average dependence on transfer payments is not immediately clear.

The central point is that Aroostook County's private income generating engine is highly concentrated in several natural resource based industries and their support structures, that these industries have not generated sufficient employment opportunities to maintain the population and that, as a result, a supportive economy dependent on transfer payments, mostly medical payments, has developed to serve the aging population.

These facts highlight why it is important to diversify the County's economy through the development of the clusters described in the chapters that follow.

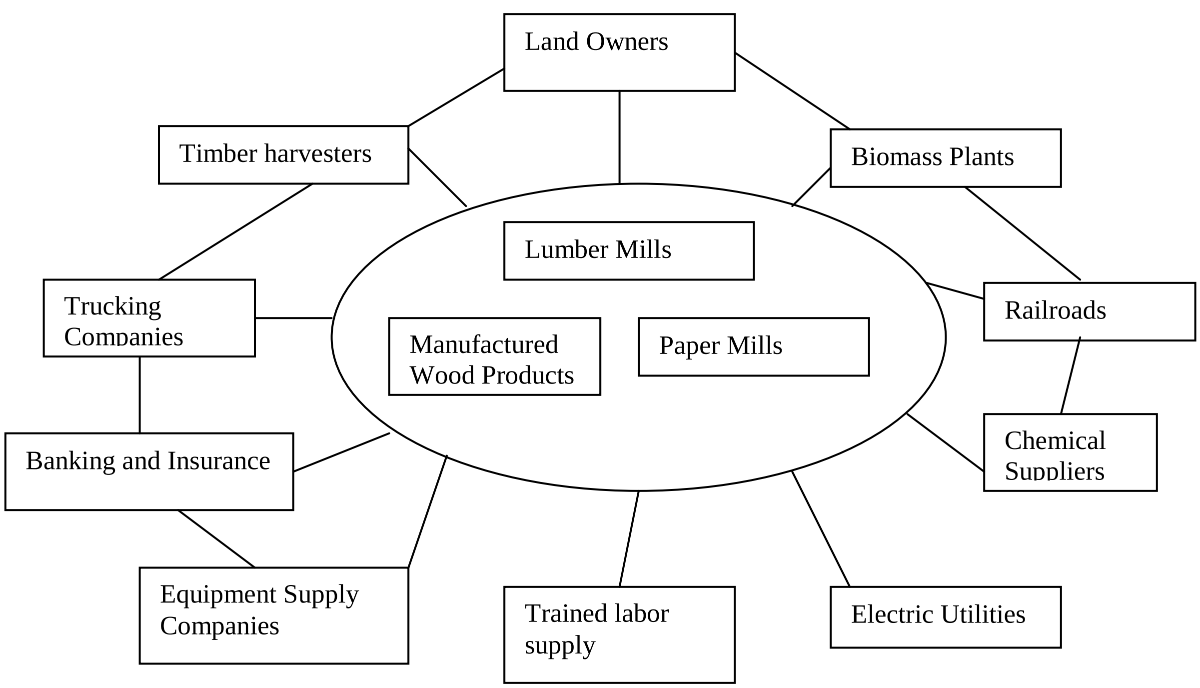
Forest Products

The forest products industry is by far the County's largest, with $719 million in value added output. Over 50 forest products companies engaged in all sectors of the forest products industry are located in Aroostook County, and employment totaled over 3,500 in year 2000.

Stretching from New Hampshire across the entire state of Maine through Aroostook County and well into New Brunswick, the regional forest products industry is of a size, scale and complexity to function as an industry cluster rivaling those seen in major industrial states.

The cluster has a long history here in Maine, and has a developed a vast system of forest lands and industrial infrastructure, including road systems, paper mills, lumber mills and manufacturing plants, that are closely linked and provide unique competitive advantages. The advantages include a large pool of skilled labor; availability of in-depth expertise on forest management and mill operation; and competitive pricing among multiple suppliers, contractors, and vendors. All these factors have kept the Maine industry competitive over many generations.

Figure 1
Aroostook Forest Products Cluster



Economic conditions

Nationally, both the lumber and paper industries have been experiencing an extended period of below normal prices, spurred by intense competition from Canadian and overseas producers.

In the lumber industry, demand has remained high due to continued strength in housing starts fueled by low interest rates, even as the rest of the U.S. economy falters. New home sales hit their highest point ever in May of this year. While tariffs imposed last year on some Canadian lumber had been expected to help U. S. producers, heavy production by Canada mills, particularly in the western provinces, created excess supply and kept prices from rising. While in the last two months lumber prices have risen somewhat, the long term effect of two years of low lumber prices has had a significant impact on producers in Maine, with closures and cutbacks at a number of mills.

The paper industry, unlike lumber, has not experienced strong demand, and has been more affected by the general weakness of the overall economy. Business spending on advertising is down, and consequently prices for lower grades of paper have been down for over 2 years. The market for higher grades of paper has been somewhat better, although the newer more modern mills outside of Maine have significant cost advantages for such products. The closure of the Great Northern mills in Millinocket sent shock waves through the state and revealed the weakened condition of the paper industry statewide. Continued weakness in the economy is pushing other mills toward the brink as well. The only bright spot currently is International Paper's decision to invest $112 million in rebuilding its No. 3 paper machine in Jay, which suggests that Maine mills can still compete successfully and grow.

In short, the historic strength of the forest products sector is under siege due to competition from lower-cost producers in Canada and overseas. Maine has not been a low cost producer for many years, with businesses here paying higher rates for wages, taxes, insurance and power costs. Instability in statewide forest policy, as illustrated by a constant stream of referenda on clear cutting, has fed the perception that Maine is not a good place for the forest products industry to invest.

As more operations shrink and close, the traditional competitive advantage available to the industry is being eroded. Great Northern's recent closure is a good case study of how this happens. The closure itself resulted in the loss of 1,100 direct jobs at the two mills. At the same time, the numerous contractors that supplied the mills with fiber and other materials faced the loss of their main customer; the railroad had to lay off workers; the local hospital suffered from unpaid bills.

The sharp reduction in demand for fiber, just to take one example, leads to a glut on the market and lower prices. In the end some logging operations must close. Thus the total number of the suppliers is reduced, competition among suppliers is lessened, and the competitive advantages of the cluster in the region are weakened.

Lumber mills

Older sawmills in the region, such as Sherman Lumber, have closed, and more threaten to close in the next 12 months if conditions don't improve. While both the paper and lumber industry are used to highly cyclical prices, the latest down cycle has persisted for much longer than usual. Both the U.S. and Canada suffer from overcapacity in lumber production, creating steady downward pressure on prices. Meanwhile, the low interest rates and high levels of housing starts nationally that have kept demand for lumber high over the last several years will not last much longer.

The U.S. has been the primary export market for Canadian lumber for several decades. Canadian producers operate under different conditions than their U.S. counterparts, with the majority of Canadian forest lands owned by the government, which charges little or no stumpage fees to lumber harvesters. This provides a cost advantage to Canadian producers, though most Canadian producers will dispute this. The past decade has been characterized by continued tension on this issue, with U.S. attempts to impose tariffs failing after NAFTA became effective. A negotiated settlement with Canada in 1996 resulted in a quota system for Canadian lumber which operated with success up until its expiration in 2001. Following expiration, Canadian producers increased exports to the U.S. significantly, creating hardships for U.S. producers and generating pressure to once again level the playing field.

In March 2002 the U.S. Commerce Department imposed tariffs totaling 27% on some Canadian lumber. The tariffs did affect Canadian producers but ultimately had the opposite effect to that intended; lumber producers, particularly in western Canada, boosted production and kept prices down (in part because they did not believe that the tariffs would be upheld in court). Canada appealed the tariffs, and in May of this year, the World Trade Organization (WTO) issued a ruling in Canada's favor, though this decision is non-binding until further appeal is completed. Parts of the U.S. position were validated by the WTO review, and the dispute continues.

A weakening of the U.S. dollar recently has helped Maine mills, and the effects of this exchange rate reduction may ultimately be more significant than up-and-down efforts on tariffs. Whether this will be sufficient to revive Aroostook mills that have been unprofitable for an extended period remains to be seen. A good sign is that modern mills manufacturing oriented strand board (OSB) in the southern part of the County weathered an extended period of lower prices and are now seeing prices rebound.

Lumber mills are primarily dependent on the market for dimensional lumber. However, the market for wood chips at the region's paper mills is also a factor, as chips produced as a byproduct of milling operations provide an important revenue stream. For this reason the closure of major paper mills, such as Great Northern, have a significant impact on area lumber mills.

Paper products

Depressed demand for paper products has forced almost every mill in Maine to scale back operations, including Fraser in Madawaska. The current outlook does not foresee any rebound in demand in the near future, and some temporary layoffs may end up being permanent. On the positive side, the emergence in the last decade of large vertically integrated companies such as Irving and Nexfor that operate easily on both sides of the border has bolstered the ability of local mills to survive down cycles and weather exchange rate fluctuations. These companies, unlike some of the larger multinationals, are heavily invested in Maine and New Brunswick in land, lumber mills and paper mills, and both operate with considerably longer planning horizons than some of their larger competitors.

Maine paper mills typically have higher costs than mills in other regions of the world (Jaako Poyry, 1995). Maine mills can never be truly low cost producers because of higher costs for labor and energy. Maine's effort to reduce utility costs through deregulation has not produced significant savings for most mills in the cost of purchased power. Those mills that have achieved savings have done so by developing their own power generation capabilities; Fraser's investment in co-generation facilities in Edmundston have reduced costs for its mills on both sides of the river. These types of investments are important in positioning the mills for long term viability in an industry where cost cutting is a key for ongoing success.

Manufactured wood products

Houlton International, the region's only turned wood products company, closed its doors in fall 2002, with the loss of 80 jobs. Statewide, turned wood and flatwood products manufacturers have been hurt the most by competition from China and other overseas manufacturers. Many Maine firms have closed. The long-term outlook for this sector remains poor.

Biomass

An important part of the forest products cluster is the network of biomass plants that handle waste wood and sawdust from area sawmills. Those mills that have onsite biomass facilities have a significant advantage in terms of waste disposal and energy costs. While biomass plants have a considerably higher cost per kWh of power produced when they sell power to the transmission grid, they can provide power (and sometimes steam) to adjacent mills at rates below market when wheeling charges are avoided. They also serve an essential waste disposal role for the lumber mills, as landfilling of wood waste is cost prohibitive.

The Rail System

While the vast majority of wood products are moved by truck, the availability of rail is important as an alternative. The oil price shocks this past winter, for instance, made moving raw material long distances by truck very costly. The former Bangor and Aroostook, now the Montreal, Maine and Atlantic (MM&A), is not in a stable financial position at present. Closure of the Great Northern mills late last year removed 25% of its shipping volume, and while Millinocket has resumed some production, volume has not returned to previous levels.

The Maine Department of Transportation (MDOT) has taken significant steps in other regions of the state to maintain rail lines. MDOT's assistance may be necessary to assure the long term viability of the rail system in Aroostook. The rail system is a very important link for the County that should be maintained, as its loss would leave the County solely dependent on long distance trucking for freight movement. Recent forward progress on improving the marine terminal at Searsport may help the railroad in the long term, as the MM&A is a key link for the port for both northern Maine and Canada. While the MM&A remains in a precarious position financially, it is a major asset for the region and local industry and deserves special attention. Efforts to encourage movement of more freight by rail will do the most to stabilize the financial situation.

Areas of Strength

Despite this grim picture, there are several companies that remain strong and continue to invest. Columbia Forest Products, which employs 230 in the manufacture of hardwood veneer, is planning a $6-7 million dollar expansion next year. Northern hardwood veneers remain in high demand, and the outlook is bright. The two OSB mills in the region continue to be highly competitive.

Katahdin Forest Products in Oakfield, which has seen employment grow to over 100 in the last year, is a special success story. It has experienced steady growth and is investing in upgrading its production operations. Katahdin uses the abundant cedar in the region to manufacture log homes, fencing and other cedar wood products. Cedar has long been ignored as a potentially valuable wood due to limited markets, and the lack of cutting pressure has resulted in an abundance of this wood in the region. Both quantity and quality of cedar logs are reported to be good at this time.

Cedar has considerable potential as a natural pest and decay resistant wood, and the banning of certain types of pressure treated lumber that use arsenic has raised its value. Over the past 20 years a number of sawmills in the County using cedar have failed or are no longer in operation, including the Irving mill in St. John Plantation. However, companies that are able to create value added products, and to use wood efficiently and economically, have been able to grow. This approach, combined with the increasing popularity of cedar due to its decay resistance, may create opportunities for other smaller mills in the region as well.

Dealing with Industry Down Cycles

Opportunities may also exist to develop innovative financial solutions for smaller wood product companies, which are particular vulnerable during extended down cycles. The availability of Empowerment Zone funding, along with overall concern for the wood products sector, makes this a good time to consider more radical solutions to the cyclical problems of the industry. Smaller wood product firms tend to suffer most from the swings in prices for wood products, and often have trouble obtaining capital during down cycles. A Wood Products Stabilization Fund could offer a means to help these firms by creating a rainy day fund. Here is how it might be structured. When specified lumber prices are above some established ceiling of $X for three consecutive months firms could pay a voluntary fee of say 1% of sales into a fund to be matched by Empowerment Zone money. Any contributor would then be eligible to draw down its percent share and the EZ match based on contribution when prices are below an established floor of $Y for three consecutive months.

There are numerous factors to consider in creating such a fund, including:

- the forest products sectors that would be targeted (logging, lumber, manufactured wood products?)
- the size of qualifying firms (large firms could consume all available funding)
- the price thresholds both for contribution and withdrawal
- the duration that funds will be held (small firms may not wish to lock up capital for too long)
- the level of match provided with Empowerment Zone funds

These and other factors would determine whether such a fund would be successful or not. Further analysis of the feasibility of this concept is required.

Summary outlook

Continued weakness in the national economy may lead to more layoffs at paper mills across the state, particularly since some mills have been unprofitable for extended periods. The recent rise in lumber prices may give a slight reprieve for area lumber mills, many of which have seen below normal prices for upwards of two years. Mills that produce more specialized products such as veneer, or the increasing popular oriented strand board, face a brighter future. Forest products will remain an important part of the local economy for years to come, but employment in this sector is likely to continue to decline gradually as operations seek ever increasing efficiency and reduction in costs.

Recommendations

Special attention is warranted for key facilities in the forest products cluster, including large paper and lumber mills, biomass plants, and rail systems. Loss of the some of these facilities could severely weaken the cluster in the future.

- Many of the issues facing the forest products industry are statewide in scope, rather than regional in nature. Stability of policy toward harvesting and production is essential. *Therefore state government should be encouraged to develop a coordinated long-term strategy and policy for maintaining the health of the forest products industry.*

- *In the short run, cost pressures at certain local wood products businesses might be alleviated by an aggressive use of Empowerment Zone and Tax Increment Financing incentives*.

- *Innovative financial solutions such as a Wood Products Stabilization Fund should be explored.* The availability of Empowerment Zone funding, along with overall concern for the wood products sector, makes this a good time to consider more radical solutions to the cyclical problems of the industry.

- *Business assistance programs and the Loring Technology Center resources should be used to encourage entrepreneurs and help existing companies expand.*

- *Ways to exploit the abundant supply of cedar in the region to promote woods products businesses should be explored by the Northern Maine Development Commission.*

- *County officials should work with area businesses and state officials to generate demand for rail shipping.* This would be an important step in stabilizing the local rail system.

Technical note – Forest Products

Information was gathered from interviews with selected industry leaders in the region, and was supplemented with interviews done previously in the region for the statewide cluster assessment. Those interviewed included:

Company	**Location**	**Profile**	**Contact**
Levesque Lumber	Ashland	Softwood Lumber	Dan Levesque
Maine Woods Company	Portage	Hardwood Lumber	Randy Karon
Katahdin Forest Products	Oakfield	Cedar homes	Dave Gordon
Columbia Forest Products	Presque Isle	Hardwood veneer	Nick Straetz
Nexfor Fraser Paper	Madawaska	Paper, wood products	Don Tardie
Wheelabrator Sherman	Sherman Station	Biomass Plant	Brett Bernhardt
Key Bank	Presque Isle	Industry Lender	Brian Flewelling
Previously Interviewed			
Irving Woodlands		Forest lands	Chuck Gadzik
Maine Woods Company		Hardwood Lumber	Greg Cyr

In addition, former State Economist and current wood products expert Lloyd Irland provided ideas for this section.

Agriculture and Food Products

Agriculture and food processing is second only to lumber, wood and paper in importance to the Aroostook County economy. In 2001, farm earnings in Aroostook County amounted to $25 million on cash sales of approximately $130 million, and earnings from food processing amounted to $28 million on sales of between $170 and $180 million.[4] These industries provided nearly 3,000 jobs, accounting for approximately 7% of the County's total employment and personal income. This concentration is much higher than the national averages for these sectors and thus represents a clear area of competitive advantage for the County.

Table 4
Indices of Industry Concentration,
Aroostook County 2001

Category	Aroostook	Share of total Aroostook economy	U.S. – share of total economy	Aroostook/ US ratio
Farm employment	1,740	4.2%	1.8%	231.3%
Farm proprietors employment	1,061	2.6%	1.3%	196.7%
Farm wage & salary employment	679	1.7%	0.5%	319.0%
Food Processing	1,125	2.7%	0.9%	312.6%
Farm Earnings ($1,000)	$ 24,959	2.5%	0.6%	416.7%
Food Processing employment ($1,000)	$ 28,076	2.8%	0.9%	311.1%

Source: U.S. Department of Commerce Bureau of Economic Analysis

In Aroostook County, farm employment of just over 1,700 people amounted to 4.2% of the County's total employment. This was more than double the 1.8% share for the U.S. as a whole. Likewise, the food processing industry has three times the national average share of both employment and earnings in Aroostook County.

One important difference between agriculture and food processing is in the area of productivity. Aroostook's food processing industry is slightly more productive than the national average. On average, it generated $11.30 of sales for every dollar of payroll in 1997, 3% above the national average of $11.00.[5] Aroostook farmers, on the other hand, generated net income equivalent to 17% of cash sales, well below the U.S. average of 25%.[6] The food processing industry in the County has invested heavily in modern equipment and increased productivity, while investment by farmers varies widely depending on the operation. This points out the importance of such issues as irrigation and crop rotation for the continued health of the farming side of the industry.

[4] U.S. Department of Commerce Bureau of Economic Analysis http://www.bea.gov/bea/regional/reis/action.cfm CA25N Total full-time and part-time employment by industry and CA05N Personal income by major source and earnings by industry. Sales of food processors were estimated from 1997 Economic Census data and interviews with industry representatives.

[5] U.S. Bureau of the Census 1997 Economic Census.

[6] Bureau of Economic Analysis Table CA45 Farm income and expenses, 2000.

Another indication of the importance of agriculture in Aroostook County is its preeminence within Maine. According to the 1997 Census of Agriculture, Aroostook County had 889 farms, cultivating approximately 325,000 acres and selling approximately $110 million of agricultural products. While county farms represented only 15% of all farms in Maine, they accounted for 25% of all farm sales, 27% of all farm acreage and 28% of the value of all farm machinery and equipment in Maine. Table 5 compares the average Aroostook farm to the average farm for Maine as a whole.

Table 5
Comparison of the average Aroostook and Maine farm, 1997

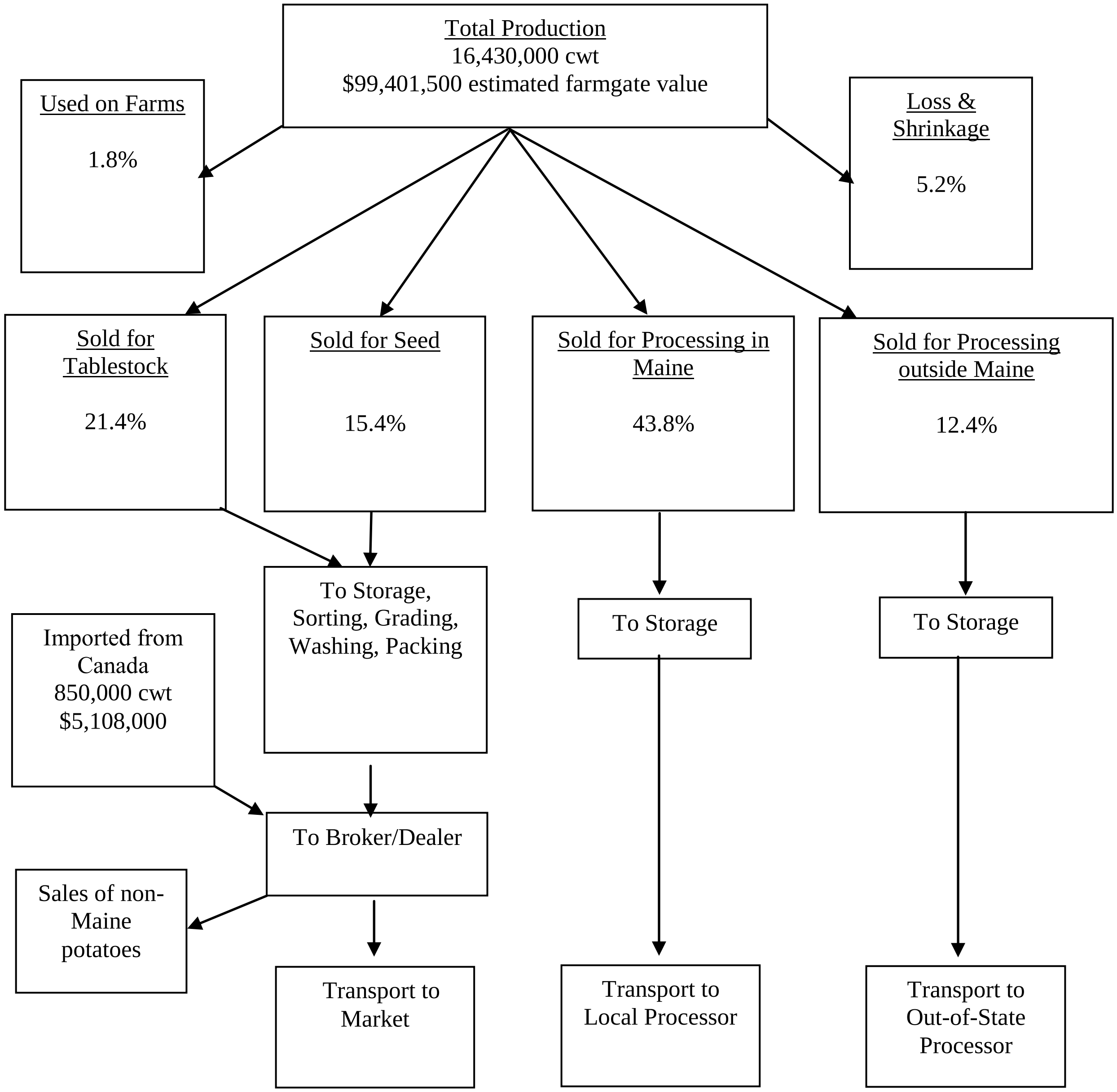
Measure per farm	Aroostook	Maine
avg size (acres)	365	209
avg value, land and building ($)	$278,000	$251,000
avg value, machines and equipment ($)	$91,000	$49,000
avg land value per acre	$716	$1,190
avg value of sales ($)	$123,300	$75,500

Source: U.S. Bureau of the Census, 1997 Census of Agriculture.

The vast majority of Aroostook's agriculture is based on the potato industry. The cash sales of Aroostook farms in 2001 were approximately $130 million, about $100 million of which was "farmgate" sales of potatoes.[7] The sales of Aroostook food processors were estimated to be between $165 and $175 million, of which approximately $160 million was accounted for by potato products.[8] The $165 to $175 million sales of food processors includes the value paid to local growers for their produce, so the two sales totals cannot be added to arrive at a single total. Figure 2 illustrates this distinction for the potato industry and serves as a model for the slightly larger agriculture and food processing sector.

[7] *Ibid*.
[8] U.S. Bureau of the Census 1997 Economic Census and interviews with industry participants.

Figure 2
The flow of potatoes from the Maine farm
2001 crop



As illustrated in Figure 2, of the $99.4 million farmgate value of Aroostook's potato crop, the majority is sold to local and out of state processors, while the remainder goes to fresh market or seed. Sales beyond the "farmgate" represent the forward linkages of this sector, the value added elements. These are the factories that process the crops, the truckers who transport them both in the County and to brokers and other wholesale and retail buyers, the broker dealers who sell the potatoes (both those from the County and any others they can find buyers for) and the packing plants that wash, sort, grade and package fresh potatoes. The value added by all of these businesses when added to the farmgate value of the crop amounts to approximately $293 million.

Figure 3
Direct Economic Impact on Maine of the Maine Potato Industry, 2001 crop

Implicit Sales to Maine Growers (Home Use, Shrinkage & Waste)
1,150.000 cwt (7%)
$6,957,000

Sales of Tablestock to Wholesalers	Sales of Seed to Wholesalers	Sales of Processed Potato Products	Sales to Processors outside Maine
3,520,000 cwt (21%)	2,520,000 cwt (15%)	7,195,000 cwt (44%)	2.041,000 cwt (12%)
$35,552,000	$25,492,000	$150,000,000	$12,348,000

Imports from Canada*	Wholesale Mark-Up	Transport Sales	Sales of Starch	Sales of Animal Feed
$5,108,000	$13,250,000	$38,400,000	$9,000,000	$2,000,000

Total Sales of the Maine Potato Industry
$293,000,000

For potatoes, other vegetables and oats, Aroostook accounts for the lion's share of Maine's acreage (see Table 6). Other vegetables are especially important as rotation crops for potatoes. Even if they cover only the costs of production, they are valuable as a way of maintaining the soil productivity of the cash crop, potatoes.

For hay and milk cows, Aroostook is less important because the bulk of Maine's dairy industry is concentrated in the center of the state.

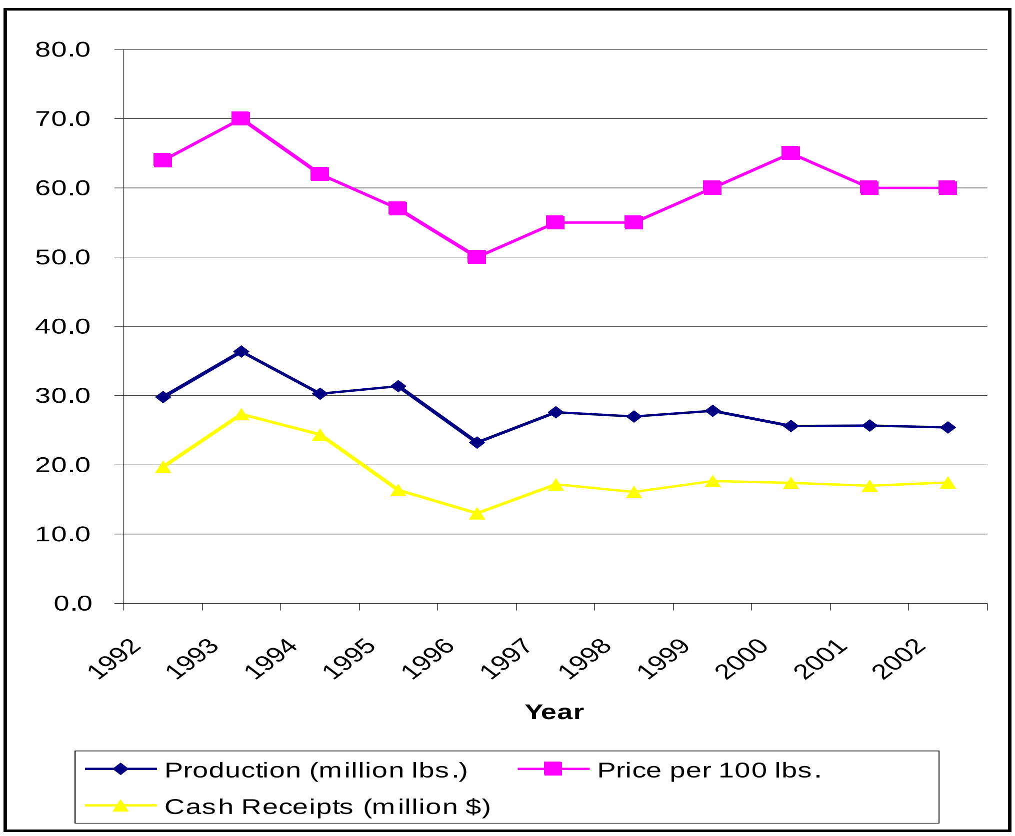
Table 6
Crops & Livestock by Type, Maine and Aroostook, 1997

Crop/Livestock	Maine	Aroostook	Aroostook %
Potatoes (1,000 acres)	73.1	65.5	90%
Other Vegetables (1,000 acres)	11.7	7.4	63%
Oats (1,000 acres)	22.4	20.6	92%
Corn (1,000 acres)	27.5	0.8	3%
Hay (1,000 acres)	214.0	22.0	10%
Beef Cows (1,000)	11.8	2.9	25%
Milk Cows (1,000)	40.7	1.5	4%
Hogs & Pigs (1,000)	6.0	1.5	25%
Chickens (million)	6.1	1.1	18%

Source: U.S. Bureau of the Census, 1997 Census of Agriculture

The area of beef production, however, does hold great promise. While sales of livestock and poultry produce accounted for only 5% of Aroostook farm sales, Aroostook farms accounted for 14% of the state's beef farms and 25% of the state's beef cows.

Figure 4
Production, Price and Sales, Maine Beef Cattle 1992 to 2002



Source: New England Agricultural Statistics Service New England Agricultural Statistics, 2002

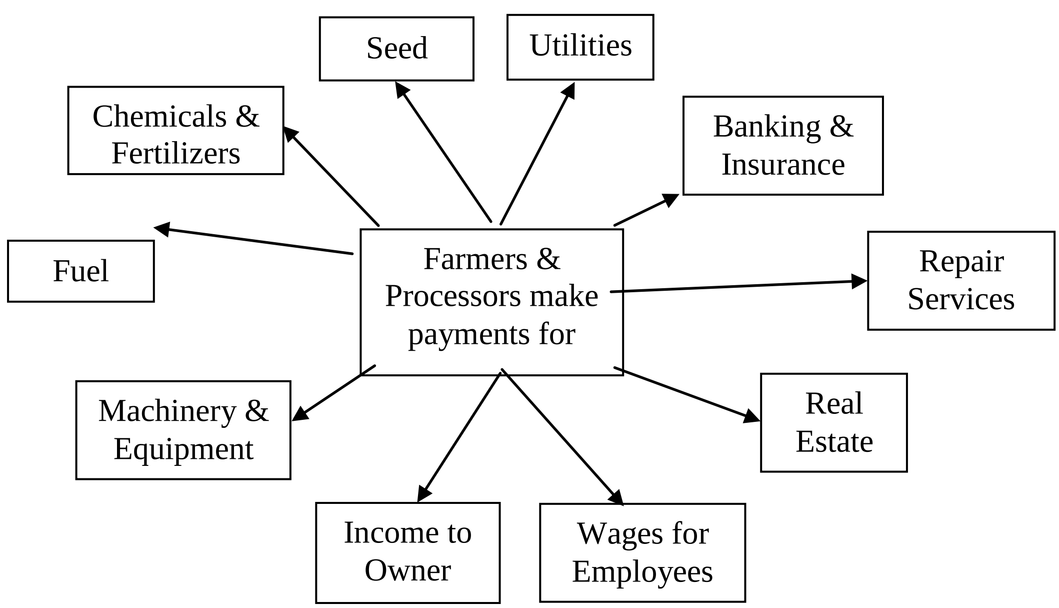
Figure 4 shows that Maine's cattle industry is increasing the value of its product and avoiding the declining prices that have traditionally hurt agricultural enterprises. Of particular significance here is the growth of beef sales from Wolfe's Neck Farm in Freeport. Having grown beyond what it can produce at its own location, the farm operates two feeder lots in Aroostook County. With funding from the Maine Department of Agriculture, the farm undertook a study to determine the feasibility of establishing a slaughterhouse in Maine. The conclusion was that it remains more economical for the time being to ship beef out-of-state for processing. However, as growth continues, the economics behind this decision will change.[9]

Another component of the agriculture sector that holds promise for growth is organic farming. Fourteen organic farms in Aroostook County are certified by the Maine Organic Farmers and Growers Association (MOFGA). At least one, Wood Prairie Farm, has developed a substantial market through internet sales. Together these enterprises comprise a cluster of opportunity within the larger agriculture sector.

The Agriculture/Food Processing Cluster

Direct sales of the agriculture and food processing sector is only part of its significance to the County. Growers and processors support a vast array of supplementary industries including farm equipment suppliers, chemical and fertilizer producers and distributors, potato handling manufacturers, plastic and bag manufacturers, truckers, brokers, bankers, insurance agents and others. These supporting industries help to increase the competitiveness and productivity of the cluster.

Figure 5
The Agriculture and Food Processing Cluster in Aroostook County



[9] We have requested a copy of this study and will include an analysis of its findings in the final version of this report.

Estimates of the value of these linkages for farmers are shown on Table 7.

Table 7
Farm Income and Expenses, Aroostook County, 2000

Item	($1,000)
Total cash receipts from markets	130,810
Cash receipts: livestock and products	7,865
Cash receipts: crops	122,945
Other income	12,170
Government payments	4,530
Imputed and miscellaneous income received	7,640
Total Income	142,980
Total production expenses	125,300
Feed purchased	590
Livestock purchased	1,715
Seed purchased	12,614
Fertilizer & lime (incl. agric. chemicals)	23,579
Petroleum products purchased	5,918
Hired farm labor expenses	21,278
All other production expenses	59,606

Source: Bureau of Economic Analysis Table CA45 Farm income and expenses, 2000.

Of their approximately $143 million income, Aroostook farmers spend just over $125 million on production expenses. The largest individual expense category is fertilizer, followed by labor, seed and then petroleum products. Other major expenditures include repair services, land and building rentals, insurance and financial services. In addition, farmer capital expenditures on tractors and similar equipment, storage sheds, irrigation equipment and bagging/packing equipment constitute major expenditures in the local market.

Figures on the production expenses flowing from the $170 to $180 million sales of Aroostook's food processing manufacturers are less readily available. Subtracting approximately $50 million paid to growers and $30 million to workers, leaves between $90 and $100 million spent on other material inputs, energy, water, transportation, repairs, other expenses and profits. While not all of this is spent in Aroostook, it does highlight the importance to the County of this cluster.

Issues and Opportunities

Over the past generation, Aroostook County's agricultural sector has moved from dependence upon a single, basic commodity to a wider variety of specialized products. The future vitality of the industry depends on recognizing the nature of this change and capturing the opportunities it presents.

There are two essential characteristics of a commodity industry. First, the source of the product is indistinguishable and largely unimportant to the customer. Second, price is the predominant factor in determining whose product a customer buys. Throughout the

1940's, 50's and 60's, these factors served Aroostook agriculture (primarily potatoes) well. Fresh potatoes were a staple of virtually all consumers' diets, and bags of fresh potatoes from Aroostook a good buy for households throughout the Northeast.

Since at least the 1970's, three factors have drastically reduced Aroostook's advantage in this market. First, the vast movement of women into the labor force changed the nature of household food preparation and with it the formerly steady growth in demand for fresh potatoes. Second, the development of much larger farms in the Pacific Northwest, supported by irrigation from the hydroelectric power developments of the Depression, eroded the County's relative price advantage (an effect compounded by the increase in Canadian imports in the 1990's). Third, the vast expansion of fast food outlets and with them the growth in demand for frozen French fries further eroded the position of Aroostook's basic potato product--the standard household round white potato.

These changes led to the departure of hundreds of growers from the business, and the withdrawal of thousands of acres from potato cultivation. It has not, however, been a death knell for the industry. To the contrary, the removal of marginal land from cultivation provides those growers who remain with an unprecedented opportunity to build a solid foundation for the future. If the approximately four hundred growers now cultivating approximately 64,000 acres make a commitment to increasing their yields on that land and growing the product their customers want, the industry can maintain its cluster of support industries and look forward to a bright future.

Recommendations

1. Increase yields through investment in water sources, irrigation equipment, potato storage facilities and rotation crops;

Maine has a slightly lower yield per acre in potato production than competitor states and a vastly lower level of irrigation.

Table 8
Production, Irrigation and Yield, Major Fall Potato Producing States, 1997

State	acres	% irrigated	Yield (cwt/acre)
Idaho	394,977	100.0	355
Colorado	85,446	100.0	323
Oregon	57,653	99.4	474
Nebraska	24,630	97.6	390
Washington	155,074	94.7	569
Wisconsin	85,304	91.6	354
Michigan	44,931	74.6	300
Minnesota	72,434	52.1	282
New York	23,923	33.0	275
North Dakota	109,777	26.0	200
Maine	73,085	11.8	261

Source: U.S. Department of Agriculture Census of Agriculture, 1997 Table 51 Number of Potato Farms. Harvested Acres, Percent Irrigated.

Investing in a water source and irrigation equipment can, at a minimum, eliminate or minimize the risk of crop loss and increase long term yield by 20%. In addition, regular irrigation can reduce deformities, size variations and other partial damage that reduces the value of a potato crop. In addition, increased grower investment in irrigation would increase sales for equipment dealers and for the range of service providers involved in irrigation project development—landscape architects and designers, engineers, earth moving and well drilling contractors as well as specialists in supervising and servicing water storage and delivery systems. Maine Potato Growers (MPG) already installs and services systems in New Hampshire and Massachusetts. A significant investment by local growers would strengthen its business as well as its competitors. There does not, however, appear to be any likelihood of attracting any irrigation equipment manufacturers. The demand in the West where irrigation is both fully applied and constantly utilized means that manufacturers will concentrate facilities closer to that market.

A similar impact on local contractors and service experts would be true for increased grower investment in storage facilities. Both construction contractors and the experts in temperature and moisture control required to correctly install storage facilities would see employment opportunities grow with greater grower investment.

For these reasons, NMDD should consider two specific actions:

- In spite of the data demonstrating the benefits of irrigation, a majority of potato growers in a recent survey said they were not considering such an investment because they did not believe that the benefits would justify the costs. For this reason, NMDC should finance a detailed cost-benefit analysis of investment in irrigation, both in water supply and irrigation equipment, and publicize the results among local growers.

- The key to success in establishing a rotation crop is finding contracts for the harvest. Currently, this task is undertaken by farmers' cooperatives and by the Agricultural Bargaining Council (ABC). In neither case, is it the full-time or first priority of the responsible party. For this reason, NMDC should fund a full time position dedicated to developing markets for rotation crops for potatoes.

2. Strengthen and diversify the processing industry.

With regard to food processing, there are two central opportunities. The first is to encourage additional investment in French fry production. While the market has been weak in recent years with the recession and health concerns about fries, there is little doubt that the market will revive. As it does, the capacity of existing processors will become more fully utilized, and the industry will look to add new plants. If Aroostook growers invest in the irrigation and storage facilities necessary to assure a steady supply of high quality potatoes, the industry will certainly consider an Aroostook location. NMDC should maintain close contact with the three major producers—McCain's, Simplot and Lamb Wesson—about its advantage as a supplier to the Northeast and European markets.

The second challenge in the food processing sector is to develop the smaller industries dependent on new product development. These firms are in many ways like prototype developers. They invent new products, test them on the market and then, if they are successful, hope they can finance the production necessary to meet a large national or even regional customer. On the one hand, these firms need marketing assistance to get their products in front of the increasingly concentrated and competitive food buying industry. On the other hand, they need the financial and production assistance to capitalize on an opportunity when they do make a big sale.

For these reasons, NMDD should consider two specific actions:

- NMDC should maintain close contact with the three major French fry producers—McCain's, Simplot and Lamb Wesson—about Aroostook County's advantage as a supplier to the Northeast and European markets and as the home of a community of progressive growers increasing their productivity through investments in rotation crops, irrigation and storage.

- NMDC should fund a full time position dedicated to providing marketing assistance to the County's non-French fry food processors.

3. Grow the beef producing sector.

Beef production complements the County's existing agricultural structure and offers an opportunity to further diversify the processing sector. NMDC should contact cooperative slaughterhouses in western Massachusetts and northern New York to see if there are opportunities either to create a similar operation in Maine or to provide an alternate outlet for Aroostook beef. These conclusions are subject to further discussions now scheduled with the Maine Beef Producers, representatives from the Maine Department of Agriculture, and the University of Maine Cooperative Extension Service.

4. Promote Aroostook County as the organic agriculture capital of northern New England.

Organic agriculture provides a strong niche market for a number of growers. Their success depends on constant attention not merely to the quality of produce but also to the ever-changing market. NMDC should undertake a commodity by commodity review of possible crops for Aroostook and undertake a marketing campaign to promote the County as an organic farm center.

In sum, agriculture and food processing does now constitute a significant cluster for Aroostook County. It is a cluster on the brink, however. The number of farms has declined steadily over the past two generations. While those that remain are, by and large, more profitable, they need to maintain sufficient size to maintain the support cluster of farm equipment dealers, farm supply retailers and wholesalers, broker/dealers, finance, insurance and repair providers that constitute the related business side of the cluster. The target of 65,000 acres of potato cultivation, $200 million of potato processing sales and steadily increasing sales of beef and organic produce should be goals for Aroostook County economic developers to keep before them.

Technical notes - Agriculture

Interviews

Company	**Contact**	**Title**	**Location**
Farmer	Kendall Shaw		Fort Fairfield
Farmer	Seth Bradstreet		Newport
Farmer	Philip Dumais		St. Agatha
Farmer	Ward McLaughlin		Mars Hill
Farmer	Conrad Caron		Easton
Farmer	Dave Tuttle		Berwick
Farmer	Rodney Chamberlain		St. Agatha
Maine Farmer's Exchange (MFX)	David Whitaker		Presque Isle
McCain Foods Inc	Leigh Morrow	Dir of Ag	Easton
Northland Frozen Food	John Cancelarich	owner	Fort Kent
Penobscot Frozen Foods Inc	Rick Starrett	owner	Belfast
Atlantic Custom Processors LLC	Bob Davis	Exec Dir	Fort Fairfield
Aroostook Starch	Linwood Winslow	Prod Supvr	Fort Fairfield
Tater Meal Inc	Stan Moore	Controller	Presque Isle
Naturally Potatoes	Rodney McCrum	owner	Mars Hill
Frito Lay	Dennis Deary	Transport Mgr	Killingly, CT
Agricultural Bargaining Council	Verne DeLong	Exec Dir	Presque Isle
Farm Credit of Maine	Ghent Holdsworth	Loan Officer	Presque Isle
Maine Farmers Exchange	Bob Davis	Exec Dir	Presque Isle
Maine Potato Growers (MPG)	Joe Lallande	CEO	Presque Isle
Maine DOL	Craig Holland	employment specialist	Bangor
UMO	Tim Dalton	ag economist	Orono
Maine Dept of Agriculture	Terry Bourgoin	seed potatoes	Augusta
Maine Dept of Agriculture	Dave Gagne	crop inspection	Presque Isle
Maine Dept of Agriculture	John Harker	ag bus asst programs	Augusta
Coop Extension	Matt Williams	crop rotation	Houlton
USDA	Wayne Honeycutt	irrigation	Orono

Tourism in Aroostook County

Tourism is defined, for purposes of this analysis, as overnight trips made to Aroostook County by people from outside the County for purposes of recreation or entertainment or pleasure. The tourism "cluster" is composed of those businesses, government agencies, and nonprofit organizations that attract and serve tourists including:

Those who create or enhance attractions

- Snowmobile clubs who support trails (37)
- Maine guides (45)
- Maine Winter Sports Center
- Art, historical, and cultural museums (33)
- Golf courses (10)
- Festival and fair organizers
- Bicycle and hiking trail maintainers
- Chambers of Commerce
- Aroostook County Tourism (and the Northern Maine Development Commission)

Those who provide lodging

- Hotels and motels (34)
- Bed and breakfast places (12)
- Campgrounds (20)
- Sporting camps (41)
- Seasonal homes (5,236)
- Real estate agencies marketing second homes (12)

Those who provide food

- Full service restaurants (55)
- Limited service eating establishments (48)

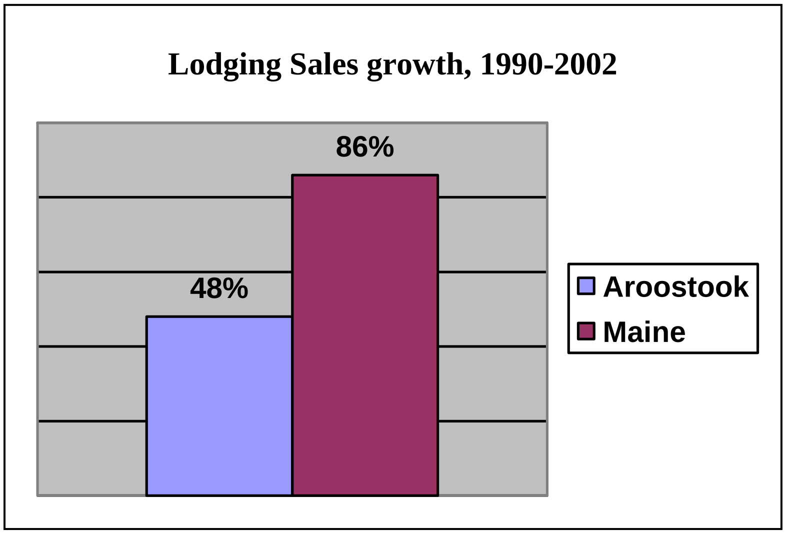
Those who provide goods and services

- Aroostook Centre Mall (45 stores)
- Main Streets
- Crafts and souvenir makers and sellers
- Gas stations, marinas, bait suppliers
- Equipment sellers/renters – snowmobiles, skis, fishing gear

Overview of Aroostook performance

To provide a general perspective, tourism has grown in all parts of Maine in the last 12 years – but it has grown more slowly in the Aroostook region. Lodging sales have increased at a rate about only half as great as the state as a whole.

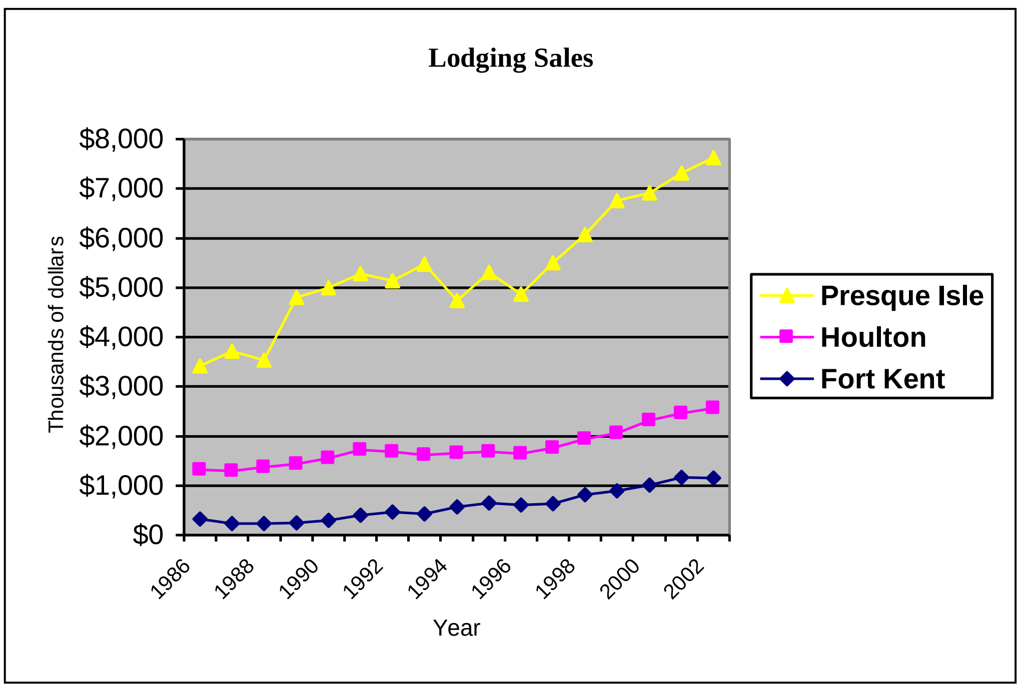
Figure 6



Within Aroostook County itself, lodging growth has been uneven. While the Presque Isle/Caribou region (at 47%) roughly tracked County lodging sales growth from 1990 to 2002, the Houlton area did worse (14%), while the Fort Kent area -- starting from a very low base – did much better (283%).

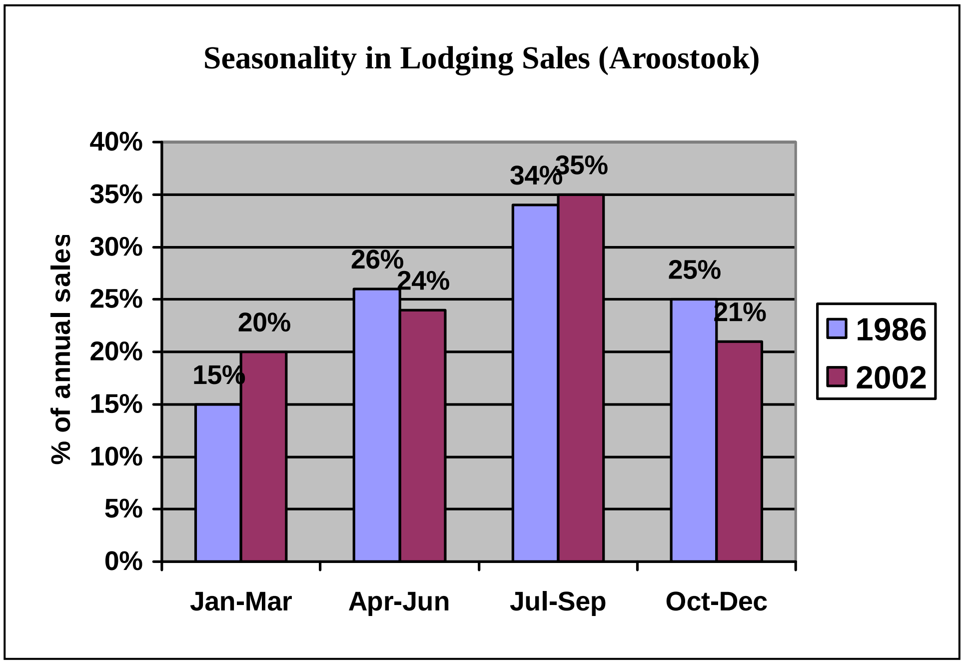
As lodging sales have shifted northward, so have they shifted to winter months. The percentage of lodging sales in the Aroostook region in the January to March quarter increased from 15% to 20% in the last 16 years.

Figure 7



This past winter the 2003 first quarter lodging sales figures increased again by 9.5% -- while elsewhere in Maine lodging fell by 4.2%. But the month by month figures show the difficulties of weather-based tourism. January is the first snow of the season for New England – a time before much snow is on the ground in Massachusetts and points south. In this month sales increased in 2003 by 48.5% over the year before. But when snow arrives down south (and in Europe), and the weather gets particularly cold in Aroostook, sales drop off. Sales fell off in February and March in 2003 by 0.6% and 3.6%, respectively. This averages out to a 9.5% growth for the quarter – but for individual motels, such boom and bust patterns do not help the bottom line.

Figure 8



Six or seven years ago the Bureau of Revenue Services collected occupancy data from lodging providers by month. Contacts with both the Bureau and the Maine Department of Tourism indicate that this data is not available now.

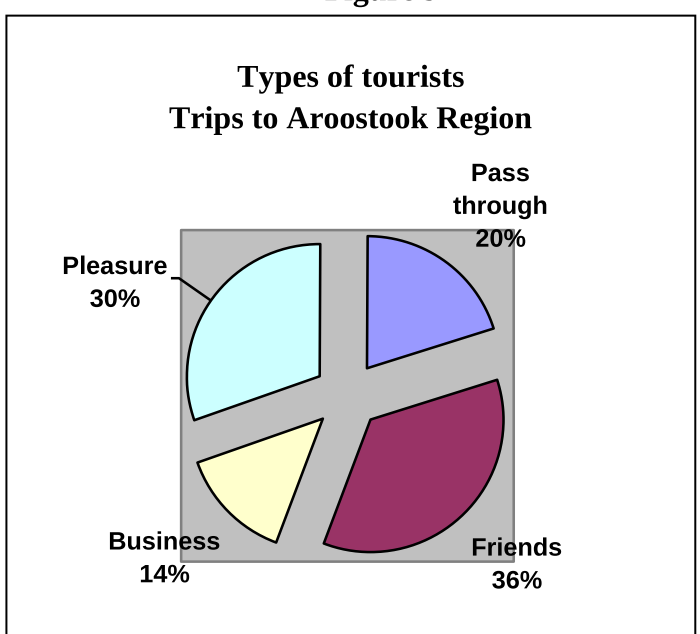
Characteristics of Aroostook tourism

The best way to explaining the cluster is to understand, in the first instance, the streams of tourists being served.

According to Longwoods International, there are 474,000 trips to the Aroostook Region (includes northern Washington County) every year. Of these, 30% fall into the category of "overnight pleasure trip," which we are using in this analysis as the definition of tourism.

The Longwoods survey does not survey Canadian tourists. The Canadian government estimates that there are

Figure 9



644,000 overnight visits per year from Canadian citizens to the State of Maine. These tourists spent roughly $150 per visit, and stayed a little less than 4 nights on average. In 1997 the Customs Service recorded 2.4 million vehicles crossing from Canada into the United States at Aroostook County border crossings (the bulk of these are local traffic crossings, but even if only a small percentage are tourist, this still could account for a significant number).

How many Canadian tourists stayed in Aroostook County? Anecdotally, this does not appear to be a major source of business to Aroostook tourism services providers. Of a total of over 60,000 tourism packets mailed out by the Maine Tourism office from January 1 to May 31, 2003, only 250 were to inquirers living in New Brunswick. There is no doubt a lot of tourism composed of family visits between New Brunswick and Aroostook. And as the analysis below will suggest, the potential for increasing this visitation is significant. But for the immediate purposes of this analysis, the existing Canadian tourist involvement in Aroostook County will be considered to be incidental.

Of the total tourists to Aroostook County, over half came for outdoor activities. This is three times higher than the percentage for outdoor tourists in the rest of Maine, and four times higher than the national average. This is both good news and bad news. The good news is that Aroostook County's outdoors are a draw to tourists. The bad news is that little else in Aroostook provides a draw. The incidence of tourists coming to Aroostook County for shopping, events, touring, or other purposes, is considerably lower than that in the rest of the state. Total pleasure trips are about a third lower per capita in Aroostook County than in the state as a whole.

Aroostook County's tourism market is slightly different than the rest of Maine. It consists of people both nearer and farther. For weekend and impulse trips, Aroostook County has a higher proportion of Maine residents than southern Maine, and a lower proportion of Massachusetts tourists – this is a factor of the 3-4 hour drive limitation for weekend visits. On the other hand, for snowmobiling tourists, for example, Aroostook County draws more people from points south of Massachusetts, such as Pennsylvania.

Outdoor activities

The principal outdoor activities people come to Aroostook to participate in include snowmobiling, hunting and fishing, and the emerging activities of cross country skiing and bicycle touring.

In 2001 there were about 9,000 snowmobiles registered in Aroostook County – about 1 in 9 in the state. A University of Maine survey ("Gasoline Consumption Attributable to Snowmobile Use in Maine," Rubin, Hart, and Morris; Margaret Chase Smith Center; 2001) indicates that the average owner uses his or her snowmobile for 23 days in a winter. The average ride is 73 miles. A little more than half took a weekend or longer trip for snowmobile riding. Of these, two-thirds stayed in commercial lodging. The average age of snowmobile riders is 34 years, and most have ridden for around 20 years. Most snowmobile households have more than one sled; the average is 2.3. About half

(48%) of snowmobile households also have gas-powered boats, and 39% own one or more all-terrain vehicles (ATVs). The University of Maine found that direct snowmobiling expenditures totaled $176 million in Maine in 1997, and when indirect effects are added in, the total economic impact is $261 million. Applying this ratio to Aroostook County, snowmobiling is a $30 million a year business.

Fishing, hunting, and wildlife watching are important to Aroostook visitors, and big business in Maine generally. The 2001 National Survey of Fishing, Hunting, and Wildlife-Associated Recreation for Maine (U.S. Department of the Interior, 2003) identified nearly $300 million in spending in Maine from out-of-state tourists on these activities. If Aroostook County gets 9.3% of this activity (as the Longwoods survey reports), then nearly $20 million is spent on these activities locally.

Table 9
Estimated spending on outdoor activities in Aroostook County

	Participants	Out of state	Spending per year	Nonresident spending	Allocated To Aroostook
Fishing	376,000	181,000	$467	$84,527,000	$7,861,011
Hunting	164,000	55,000	$771	$42,405,000	$3,943,665
Wildlife Watching	419,000	260,000	$433	$112,580,000	$10,469,940
TOTAL					$22,274,616

From 1996 to 2001, fishing and hunting days in Maine have declined, while nonresidential wildlife watching has increased.

There are no data on cross country skiing in Maine or in Aroostook County. The nonprofit Maine Winter Sports Center (incorporated 1999) is putting this activity on the international map for Aroostook County. The Center has developed two downhill and two cross country facilities in the County. The Fort Kent cross country facility (10th Mountain Ski Center) will host the World Cup Biathlon in March of 2004. This event will attract 5,000 visitors, will be attended by the international press, and will be televised daily to 20 million Europeans on German television and on the Outdoor Life Network cable station in the United States. The facility is also attracting increasing numbers of college and high school ski teams from around New England, and their parents and friends and supporters, to participate in events and training workshops. The University of Maine at Fort Kent had an increase in freshmen enrollments this past year of 40% -- from 100 to 140 – and the existence of the new facility in Fort Kent had a definite influence on this trend. Nationally, there is one cross country skier for every three downhill skiers. They tend to have more women participants than other winter sports (47%, compared to 39% for downhill skiing and 23% for snowboarding), and tend to be older (one-third are 45-54).

The County also attracts a significant number of people to family reunions. This year, for example, the Michaud family reunion in Madawaska attracted 4,000 people. There are also many festivals and fairs. Some have Acadian connections – including the new Acadian study center at the University of Maine at Fort Kent. However at present, compared to elsewhere in Maine, family visits per capita, and event attendance per capita, is lower in Aroostook County.

The preceding narrative describes the customers. They are served by the list of organizations and businesses listed on the first page. This group of businesses can be described as an "economic cluster" in that they are dependent upon the same stream of visitors. However, they are not a cluster in the sense that there is extensive cooperation and communication among them (see box on page 4 for definition of cluster).

Capacity of Aroostook tourism cluster compared to competition

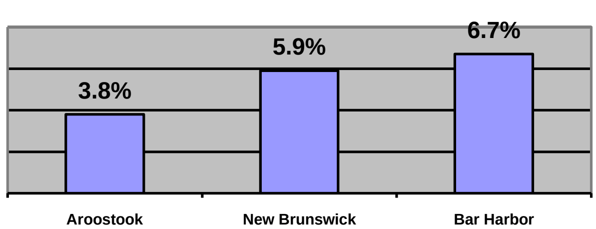
To understand the position of the local tourism industry, it is helpful to contrast it with nearby competition.

Who competes with Aroostook for the winter sports dollar? One major competitor is the downhill ski industry -- Sugarloaf and Sunday River. Besides having downhill skiing, both have extensive cross country facilities. Sugarloaf and Sunday River are "vertically integrated." They provide the advertising, the lodging, the food, the activity, the music and shows – all activities which, in Aroostook County, are provided by separate entities. The ski resorts do extensive research on their customers, they have ongoing radio and television advertising in their key (Boston) markets all winter, they create packages which are priced in order to maximize revenue in busy times, and to encourage visitors to come during less busy times. If their customer base gets interested in a new activity (like snowboarding), then the business is organized to quickly respond to the demand and derive money and market share.

For the summer outdoors dollar, New Brunswick is one nearby competitor. If a potential customer calls their 1-800 number or consults their web site, they are given individual help in planning a trip and making reservations. The government prepares trip packages and markets them aggressively.

Another nearby competitor is Acadia National Park in Bar Harbor. The National Park Service hosts a web site that provides information on all of the attractions, and through which you can make reservations for the campgrounds. It also provides current information on weather and road conditions. The Park is also advertised through having brochures at all other national parks in the country. As Acadia has 3 million visitors a year, the combined marketing power of all of the national parks is considerable.

Table 10
Annual Tourism Growth, 1992-2002



There are many factors besides the structure of the industry that contribute to greater tourism growth in nearby New Brunswick and coastal

Maine. Location is one. New Brunswick benefits from a location between population centers in Toronto and Montreal and the Atlantic Ocean. Coastal Maine benefits from the proximity of Boston. In this respect Aroostook is like a low pressure center on a weather map. To the south a circular flow of air runs from Boston to Bar Harbor and back. To the east another stream runs from Toronto and Quebec through New Brunswick to the Maritimes.

Part of Aroostook's challenge is to divert these streams to the north and west. But this is difficult when the neighboring regions have better organized tourism operations, and have more capability to monitor tourist attitudes, create new packages to meet tourist needs, have one-stop reservation services, use the internet, and advertise on a daily basis. Given this disparity in organizational capacity, it will be hard for Aroostook to gain market share.

The challenge for Aroostook County is analogous to the challenge facing older Main Streets which find themselves in competition with malls. Malls have central ownership, consistent hours, consistent packaging, management for quality products, themed events, ongoing research, and heavy advertising. To face the competitive challenge, successful Main Streets have to re-create organizational structures of a mall with independent business people. They must organize, create events, establish consistent hours, share joint maintenance expenses, advertise, and enforce sign quality standards. Downtown merchants do this through downtown organizations and chambers of commerce. They agree jointly to pay generous dues, and all cooperate in funneling their marketing through the central institution.

Possible strategies to increase tourism activity

There are at least four possible strategies to increase tourism activity in Aroostook County. Note that none are exclusive, and they can be pursued singly or in any combination.

1) Develop new destination attractions. Currently snowmobiling and outdoor activities are the major destinations for visitors to Aroostook County. Cross country skiing is developing rapidly into a new destination attraction. One possible strategy is to develop a new destination that will attract people from long distances. One proposal currently in public discussion to do this is that for a national park connected to the North Woods. Such a national park would provide the marketing connection to Acadia for the region that is now missing. Recently Paul Haertel, the former superintendent of Acadia National Park, urged Maine people to "keep an open mind" about the park in part because of its potential economic benefits. Unfortunately, the way the current proposal has been framed, both in terms of logging limitations and overall size, has created such ill feelings that most people do not have an open mind, and it is a difficult proposal to even discuss rationally. A second possibility for a new destination attraction might be upscale facilities for wildlife viewing, such as moose and bear.

2) Cross market to existing tourists to come back in other seasons. One half of snowmobilers also own powerboats, and many own ATVs. They could be presented with summer vacation packages when they show up in February. Likewise, many cross country skiers also bicycle in the summer. On the other hand, summer visitors can be presented with incentives to try activities in the winter.

3) Try to draw tourists from nearby tourist streams. Canadian travelers through New Brunswick, for example, like to be interested in active outdoor recreation; to be interested in Acadian culture; and are open to spur-of-the moment side trips. Cross marketing with New Brunswick for St. John's Valley cultural attractions could attract these visitors. On the other side, Aroostook could market to Massachusetts visitors to come up to Aroostook and "see a moose before you go." For weekend impulse visits, the area will be more successful in marketing to central and southern Maine than to Massachusetts.

4) Encourage existing tourists to extend their stays. This involves creating the kinds of lodging and eating and shopping facilities that encourage visitors to linger after their outdoor activities are over.

Of the four possible strategies, the most promising in the short run is that of cross-marketing to existing visitors. For example, 5,000 visitors will come to Aroostook County for the World Cup Biathlon in 2004. An explicit strategy should be in place to insure that they have a great experience, that they recommend Aroostook County to their friends when they return home, and that they return themselves.

The other three strategies are medium to long-term projects.

Possible strategies to improve organizational capacity

While Aroostook County Tourism has made great strides in recent years, it still has a way to go before it reaches its potential as a regional tourism promoter. The organizational structures, networks and linkages between local chambers and regional organizations are not yet strong enough to properly capitalize on events like the World Cup Biathlon. Without the regional capacity to move decisively and quickly in marketing, promotion, and infrastructure development – then it will not matter so much which of the strategies above that local officials choose to pursue, because implementation will not be able to be assured.

This said, important progress already happened. Aroostook County Tourism has created a promotional strategy involving trade shows, training, a web site, newspaper advertising, displays, a toll-free telephone line, publications, and market research. Of particular note is a new effort to create a common consumer satisfaction questionnaire for use in all participating facilities.

The challenge ahead is to build on these common activities, and to move towards creating a "virtual" regional organization that can compete with the Sugarloafs and New Brunswicks of the world.

What would that virtual regional organization have? Here are some elements:

- A consistent message, theme, and look – on the web, in print, and in the media – for Aroostook tourism promotion;
- Ongoing customer research and feedback;
- Capacity to create summer and off-season packages;
- Ability to help individual callers to plan and reserve their itineraries;
- Advertising programs adaptable to changes in weather and conditions; and
- Access to financing and market research help for tourism entrepreneurs.

The first step in analysis is to look at how much money is currently being spent on tourism promotion in Aroostook County by all actors -- the various chambers of commerce, the municipalities, the merchant groups. What if the money were pooled instead of being spent in a fragmented fashion? How much more impact might there be?

Ultimately this is heading in the direction of a regional chamber of commerce. This is the kind of organization that would be able to translate the loose association of businesses and organizations into a competitive economic cluster, and do so without requiring a large increase in dues and contributions from members.

Ideas for implementation

Here are six actions that could move this agenda forward.

Strategy	Actions
A. Cross marketing strategy	1. Create strategy for Partnership
	2. Create Biathlon plan – to welcome visitors, to maximize media, to attract back
	3. Add cross-marketing questions to standard survey
B. Organizational capacity	1. Establish ultimate vision of regional organization – a regional chamber (?), tourism council (?), other – that can be competitive with the New Brunswick operation
	2. Create 3-year plan to move the existing organization to achieve the vision
	3. Conduct a comprehensive base line marketing study to understand both the needs and interests of current and prospective tourists

Technical notes – Tourism

Principal data sources

There is no comprehensive source of information about the economic performance of this cluster. What exists is a series of fragmentary data series, which, when combined together, can provide a general picture of what is going on. The four major data sources on tourism in Aroostook County, with their strengths and limitations, are provided below:

Data Sources on Tourism in Aroostook County

Data source	Strength	Limitation
Longwoods Survey	Detailed demographics on visitors	Does not include Canadian tourists; small sample; mixes in business travelers
Lodging and Restaurant Sales, State Planning Office	Provides good data over time	Cannot separate local spending on meals and lodging from tourists
Canadian tourism data	Provides visitors to Maine and overall spending	Does not separate out Aroostook County
County Business Patterns, U.S. Census	Size and payroll of tourist-related businesses	Cannot separate tourist from general activity; gives ranges rather than actual data

The simplest way to get an overview of tourism performance is to track lodging sales in the Northern Aroostook Economic Summary District (as defined by the Maine State Planning Office – includes Danforth and parts of northern Washington County). Lodging is only a small slice of total spending, but as an indicator it is the most "pure" in the sense that changes in the indicator are largely tourist-driven.

Interview and research strategy

Compared to the other clusters addressed in this study, tourism is unique in that is composed of hundreds of small businesses and organizations engaged in a wide variety of activities. Many are members of the Aroostook County Tourism Council. Their views of tourism are encapsulated in part in the "Northern Maine Tourism Partnership" program application for 2004. In order to maximize the value of consultant time for the project, the consultant pursued an interview strategy that included people at the periphery of tourism activity in the County as well as direct participants. The goal of the interviews was to help identify promising prospects to increase tourism activity in the County. Another part of this approach was to consult a wide variety of studies that placed Aroostook County in context with neighboring tourist regions. The principal interviews and literature consulted are listed below:

Interviews

Steve Lyons and Mark Turek, Maine Office of Tourism
Bob Meyers, Maine Snowmobile Association
Sheila Jans, The Quebec Labrador Foundation
Jeff Packard, Patten Lumberman's Museum
Donald Guimond, Town of Fort Kent
Arthur Faucher, Town of Madawaska
Adrian Fox, BFT International
Max Saenger, Maine Winter Sports Center, Limestone
Kevin Simmons, Caribou Motor Inn
Shawn Manter, NMDC
Burt VerHaar, Northern Maine Regional Airport
Richard Cost, University of Maine at Fort Kent
Kallie Hatte-Kilburn and Linda Robertson, New Brunswick Office of Tourism and Parks

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Information Technology

Currently, information technology and information services companies are some of the fastest growing businesses in Aroostook County, and will likely play a leading role in job growth in the County in the years ahead. In addition, businesses outside of the IT sector in the County are increasing their use of computers and the Internet in everyday business transactions, creating further demand for employees that are familiar with computers. Jobs that utilize IT typically pay higher wages than those that do not. For these reasons, information technology (IT) should be a key part of the County's strategy for the future.

The Information Technology Sector

For purposes of this analysis, the information technology (IT) sector includes the following kinds of businesses:

- Computer software design & development
- Computer programming, database and network services & administration
- Web site design & development
- IT Telecommunications including Internet Service Providers (ISP's), Web hosting
- Data backup and disaster recovery services

This analysis also includes an examination of local industries that are significant users of IT products & services including insurance, healthcare, and information services.

Approach

Because of the lack of consistent reliable employment and occupation data and because the essence of cluster development lies in relationships, an interview process was used as the primary data source for the cluster analysis. Persons interviewed for this study are listed in the appendix for this section.

In addition, economic and labor market data, industry research, and previous economic development studies completed for the County were reviewed for findings related to the future growth of the IT sector.

Understanding the IT sector

State and regional economic performance data on the IT sector is limited and fails to capture the breadth of employment related to IT. In general, data on employment by industry sector grossly understates the significance of IT and IT-related services to state and regional economies. A main reason for this is that employment data is typically categorized by the primary industry sector of the employer. For example, computer system administrators and technicians employed by banking and insurance companies are classified as finance and insurance employment. Even with the inclusion of telecommunications which includes IT and related companies such as phone services, the data on employment in IT-related industries indicates that this sector accounts for less than 2% of all non-farm wage and salary employment in Maine for 2001. One need not look further than the typical Maine company and see the amount of IT equipment being used that is integral to business to see that IT-related jobs are a much larger part of the employment picture than are typically portrayed in employment data.

Regardless of the exact amount of IT-related employment in Maine and Aroostook County, the wages generated by IT-related jobs are considerably higher than most other industries, as indicated in Table 11.

Table 11
Average Hourly Wages in Maine for IT Occupations Vs All Occupations, Maine Statewide & Northeast Portion of State

Occupational Code	Occupational Title	Average Hourly Wage in $	
		Statewide	Northeast Portion Of State
00-0000	All Occupations	$14.46	$12.95
11-0000	All Management Occupations	$27.69	$23.69
11-3021	**Computer & Information System Managers**	**$32.02**	**$25.04**
15-0000	**All Computer & Mathematics Occupations (non-management)**	**$23.27**	**$18.90**
15-1021	**Computer Programmers**	**$24.47**	**$18.16**
15-1031	**Computer Software Engineers – Applications**	**$26.69**	**n/a**
15-1032	**Computer Software Engineers – Systems Software**	**$32.41**	**$30.11**
15-1041	**Computer Support Specialists**	**$15.72**	**$14.61**
15-1051	**Computer Systems Analysts**	**$27.26**	**$24.31**
15-1061	**Database Administrators**	**$25.25**	**$20.73**
15-1071	**Network & Computer System Administrators**	**$22.58**	**$21.04**
15-1081	**Network Systems & Data Communications Analysts**	**$22.93**	**n/a**
15-1099	**Computer Specialists – Other**	**$24.10**	**$16.29**

Source: *2001 Maine Occupational Wages*, Maine Department of Labor, Division of Labor Market Information Services, Released March 2003
* - includes Aroostook, Hancock, Piscataquis, Penobscot (excluding Bangor MSA), and Washington Counties
n/a = data not report due to confidentiality requirements

By growing and attracting IT and IT related businesses Aroostook County can benefit through increased income levels.

Information Technology in Aroostook County

There are several factors that are very important in the success of IT industry clusters in other locations around the country. These factors include:

- IT infrastructure, including ability to utilize redundant services;
- the ability to attract and retain a skilled workforce;
- research and development;
- industry networks and trade associations;
- leadership companies; and

- market potential, including local and export demand.

IT Infrastructure

Because Aroostook County is largely rural, one would expect the County to be at a competitive disadvantage with regards to IT infrastructure. This however is not the case. The population centers of Aroostook County are well served by infrastructure to support high-speed Internet Connectivity for businesses and residences alike.

There are multiple options for Aroostook businesses in obtaining high speed Internet access. Time Warner provides high speed Internet cable services to several population centers in the region. Presque Isle was one of the first areas in the Country to receive Roadrunner service and it is now available in the County within the population centers of Caribou, Fort Fairfield, Limestone, and Presque Isle. Verizon currently provides T1 lines to business in the region, and although the cost of providing T1 varies depending on the total distance of lines that must be extended, the per foot cost of the lines are the same no matter where you are located in the Country. Several of the larger businesses and organizations interviewed relied on T1 lines for connectivity. Aroostook Internet located in Houlton also provides T1 service in the region and St John Valley Communications located in Fort Kent provides T1 lines as well as ISDN service.

As another broadband option, Verizon is also in the process of extending DSL services to the region. Like DSL elsewhere, the installation cost and availability will depend on local demand and distance from existing switches, however, where available DSL will provide another affordable high speed Internet option to Aroostook businesses and households.

The County is also well served by high-speed Internet wireless services. Wireless services within the County emerged out of business demand for high-speed connectivity in the region prior to the ready availability of other options and wireless continues to be the best option for several of the businesses interviewed. Two local companies, Pioneer Wireless and MFX Wireless can provide high speed wireless services to businesses within most all of the County's population centers as well as many of the County's remote areas.

Pioneer, which was interviewed for this project, extends services from Sherman in southern Aroostook to Madawaska in northern Aroostook. It should be noted that local demand for wireless broadband is still not very strong, though this is changing as more customers become aware of the benefits. Start-up costs for a company to install transmitters and receive wireless broadband are currently in the $400 range, which is competitive compared to other broadband options in the region. However, residential customers will often forgo wireless broadband due to perceived high start-up costs.

For businesses and households not requiring high speed connectivity, there are several local ISP's within the region that provide low cost, dial-up services including Aroostook Internet and St John Valley Communications.

Both large and small IT businesses interviewed for this project require broadband connections to provide an adequate level of service. Though the bandwidth requirements may be greater for the large companies like Burelle's and ATX, both large and small IT firms in the County need broadband for providing services to clients over the Web and for communications with partners, staff, vendors and clients. None of the businesses representatives interviewed for this analysis cited IT connectivity as an obstacle to business growth and development in the County; in fact, several indicated that the wide availability of connectivity options in the County provides their company with advantages over firms located elsewhere in Maine.

Several industries and businesses provide the kinds of products and services which require little to no "downtime" over the course of the year. For these industries and businesses, it is important that the IT infrastructure connecting Aroostook County to the rest of the world contain sufficient redundancy, or alternative broadband pathways, should a key digital cable or IT infrastructure component be disrupted.

Until recently, all broadband connections out of Aroostook flowed south to Portland through one fiber optic cable owned by Verizon. This is no longer the case. Efforts have been implemented or in some cases are well underway to provide a significant level of redundancy in Aroostook County. Time Warner has installed its own fiber line from Presque Isle to Fort Fairfield and is in the process of connecting this line to service and gateways in New Brunswick, thus providing an alternative way out of the County for information flows. Pioneer Wireless is also implementing plans for sending a signal to New Brunswick thus providing wireless users a third alternative route out. Until recently all, wireless users rely on the Verizon fiber optic line to move digital signals out of the County. In addition to these efforts, Verizon's SONET ring technology has helped reduce downtime due to local and regional disruptions.

The broad array of Internet connectivity options combined with the infrastructure to support redundancy, position Aroostook well for growth in the IT sector. In fact, compared to many areas of Maine and the rural and urban US, Aroostook County may even have a competitive advantage with regard to IT infrastructure.

It should be noted however, that much more than access to reliable IT infrastructure is needed to grow and sustain a vibrant IT sector. There is often a misconception that IT intensive businesses can locate and thrive anywhere that there is connectivity. This is based on the assumption that these companies can conduct all of their business through virtual broadband networks. Interviews with IT companies in the Aroostook region revealed that this assumption is incorrect. While a great deal of software development work can be done in a virtual network with companies in other locations, client services including sales, installation, training and support require extensive in person, on-site interaction. While this is not a significant obstacle to the larger software firms in Aroostook such as ATX that have full sales and support staff nationally, the smaller software and computer service firms in the County indicate that distance from potential markets and clients is a potential obstacle for growth. This is exacerbated by a lack of consistent, reliable air transportation options.

Ability to Attract and Retain Skilled Workforce

The ability to attract and retain skilled employees varies in the County depending on the size of the business. For the larger companies interviewed, attraction and retention of skilled workers is a challenge, though for the most part has not been a major impediment to growth. On the one had, the companies offer skilled employment and are able to compensate employees at levels above the regional average. This allows the larger IT companies in the region to attract the best talent that is already living within the region. On the other hand, because of the relative small size of the County, there is not enough local talent, particularly with regard to programmers and high skilled positions, to meet the demands of all the IT businesses and therefore companies must recruit talent from other areas of Maine and throughout the country. Attacking talent to the region requires the companies being able to sell the small-town, rural lifestyle offered in the County. For some professionals this lifestyle is desirable, for others it is not. The larger companies interviewed have considerable experience recruiting employees and have achieved reasonable success in there efforts.

Attraction is much more difficult for the smaller IT companies than the larger firms in the region. Staff in small software companies must possess a variety of skills. These companies need programmers that are not only skilled in software development but also project management, sales and marketing, and customer service. Recent graduates of the Northern Maine Community College and University of Maine System typically don't have the experience to meet these requirements and it is difficult for small firms to invest in long-term employee development. Therefore, in order to grow, small software firms must rely on either recruiting talent from outside the region, establishing one person branch offices at locations outside the region, or partnering with individuals and firms outside the region. Recruitment can be tough for small companies because they cannot offer the compensation packages or job security that can be offered by larger firms.

Table 12 provides data from a statewide labor force survey conducted in 2001. As indicated in the table, finding employees with the requisite computer skills was easier in Northern Aroostook, and the North Central portion of Maine which includes Southern Aroostook compared to the state as a whole and more difficult in the Presque Isle-Caribou region. It should be noted that this survey was conducted of all types of businesses not just IT businesses.

Table 12
Maine Workforce Survey – 2001 – How easy is it to find employees with the requisite computer skills?

Region*	Employer Mean Rating where 1=very hard to find employees and 5=very easy
North Central Maine	3.06
Presque Isle-Caribou	2.67
Northern Aroostook	2.94
Statewide	2.93

Source: *Maine's Labor Force Regions in Comparison*, University of Southern Maine, Center for Business and Economic Research, October 2001
* The regions are defined by the following communities:
North Central – Lincoln-Howland, Millinocket-East Millinocket, Houlton, and Patten-Island Falls Labor Market Areas; Presque Isle-Caribou – Presque Isle-Caribou Labor Market Area; Northern Aroostook – Madawaska, Fort Kent, Van Buren Labor Marker Areas

Aroostook County is home to three institutions of higher education that each offer programs in IT and IT-related fields including the Northern Maine Community College, University of Maine Presque Isle, and University of Maine at Fort Kent. In general the companies interviewed viewed these institutions as assets in providing skilled technicians but felt that more was needed to meet the demands of the programming positions.

Table 13 presents data from the statewide labor force survey on use and ranking of job training entities.

Table 13
Maine Workforce Survey – 2001 – Employer Job Training Use & Ranking

Region*	North Central Maine		Presque Isle-Caribou		Northern Aroostook		Statewide	
Job Training Entity	% Use	Rating (1=poor, 5=excellent)	% Use	Rating (1=poor, 5=excellent)	% Use	Rating (1=poor, 5=excellent)	% Use	Rating (1=poor, 5=excellent)
Maine Technical Colleges	8.0%	3.26	60.8%	4.23	8.2%	3.89	11.4%	3.66
University of Maine System	3.3%	2.60	N/A	3.91	6.6%	3.46	4.6%	3.40
Private Vendors	16.7%	3.66	2.7%	4.00	9.8%	3.93	16.4%	3.68
Public Schools & Adult Ed	6.7%	3.46	20.5%	N/A	8.2%	3.71	5.9%	3.42
Trade & Professional Associations	20.5%	3.85	N/A	N/A	16.4%	3.96	21.3%	3.67
State Agencies	8.1%	3.31	N/A	3.40	5.7%	3.27	7.7%	3.63

Source: *Maine's Labor Force Regions in Comparison*, University of Southern Maine, Center for Business and Economic Research, October 2001
* The regions are defined by the following communities: North Central – Lincoln-Howland, Millinocket-East Millinocket, Houlton, and Patten-Island Falls Labor Market Areas; Presque Isle-Caribou – Presque Isle-Caribou Labor Market Area; Northern Aroostook – Madawaska, Fort Kent, Van Buren Labor Marker Areas; N/A – question not asked within regional survey

Research and Development

Research and development R&D activity is an important component of cluster development for many industries. Information technology companies are often engaged in research and development to create new products and services to compete in highly competitive national and international markets. In many cases this R&D is done in house and built over-time on a project by project basis. Therefore, worldwide in this industry, a great deal of R&D occurs at the street level within the businesses offering products and services as opposed to occurring within research institutions. Part of the reason for the R&D being done in-house as opposed to within research institutions is the demand to get new products development and to market quickly in a rapidly changing market. Good examples of this in Aroostook County are ATX and Taxware both located in Caribou, which conduct a significant amount of in-house research for product improvements and new product development.

With that said however, even in this industry, access to research institutions within the region can provide significant competitive advantage for local firms. The Aroostook IT sector lacks any significant connections to R&D entities. The state's largest academic research institution, the University of Maine, located in Orono is viewed as being too far for Aroostook IT business to serve as a significant asset. The University of Maine System campuses located within Aroostook County at Fort Kent and Presque Isle do not have R&D as their primary mission. The state of Maine has been making R&D grants available to Maine businesses since 1999 through the Maine Technology Institute. To date, no Aroostook Company has received MTI funding for IT intensive R&D. R&D initiatives within IT are being supported in nearby New Brunswick and Quebec; however, these efforts are viewed as servicing the Canadian IT industry.

In spite of these R&D shortfalls, there is some important applied R&D occurring within select IT areas at UMaine Fort Kent in the areas of GIS and E-commerce and UMPI in the area of management information systems.

Industry Networks and Trade Associations

Industry clusters are characterized by strong networking among businesses and professionals within the industry to share resources, discuss industry trends and issues, problem solve, and to represent industry to interests outside the industry including business and government leaders. These functions are typically performed by industry or professional associations.

MESDA, Maine's association for the software and information technology industry, does not currently have a significant number of members in Aroostook County but is in the process of attempting expanding its reach through IT user groups throughout the state. MESDA has applied for a cluster enhancement grant from the Maine Technology Institute to help finance the expansion. The expansion project will involve increasing facilities and partnerships for hosting user groups.

All of the companies and entities interviewed expressed an interest in increased networking and availability of user groups, however the need was greater in the smaller firms compared to the larger companies. Also, most of the entities stressed that any efforts should be based on Aroostook needs by Aroostook businesses. There was some skepticism of statewide efforts eventually reaching out to include Aroostook interests. Another important point that was commonly expressed was that networking, training and user groups felt that they should cover not only technical IT material but also business functions such as business and project management, sales and marketing.

Leadership Organizations

Industry cluster development often includes one or several leadership organizations. In the IT sector Aroostook County has several businesses that serve to some extent as leadership organizations or potential leadership organizations. These companies can play a significant role in the future growth of IT in Aroostook County.

ATX – Founded in 1991, ATX grew out of a small two-person operation providing spreadsheet templates to local accounting businesses into a corporation with approximately 300 employees, with offices in two states, producing “off the shelve” software” for tax preparation businesses all over the US. As of the last full business year, ATX has grown to serving over 40,000 tax professionals.

ATX was acquired by UCG of Rockville Maryland in 2001. Through new product and services and through acquisitions, UCG has a portfolio of 15 business information companies providing products and services to over two million clients worldwide. UCG also acquired Kleinrock, a leading tax research software and on-line service company. The acquisitions lead to the merger of ATX and Kleinrock for the creation of the “Total Tax Office”, ATX’s comprehensive tax preparation software package.

Since, 1998, ATX has been headquartered in Caribou, Maine. With approximately 200 employees, the Caribou offices perform the sales, marketing, financial management, IT service, product support and primary programming functions for the company. Approximately 55 of ATX’s Caribou employees are programmers. The Caribou office also houses a call center operation to provide call center support for ATX products and services. An additional 85 ATX employees work out of the company’s Fort Pierce, Florida office on development of tax forms. Another 25 employees work out of Kleinrock in Maryland on the tax research components of the Total Tax Office and providing tax research products and services.

There are several reasons why ATX can be considered an IT leader organization in Aroostook County. First, it is focused wholly on IT and large enough to create a substantial local market for IT professionals including programmers. The company is currently working with the Northern Maine Community College on the development of coursework and certificate program to meet the needs of these employees as well as future IT employees in the region. Second, the company is growth oriented and is part of a much larger company, UCG, with a network of 15 companies serving clients worldwide. ATX products and services, though used by some businesses in the County, are exported all over the US bringing income and investment into Aroostook. Finally, ATX has created several “spin-offs” of persons or businesses that started at ATX and now operate separate businesses with Aroostook County, most notable Taxware and Blue Ox which are also located in Caribou. Taxware is a software development company based in Salem, Massachusetts that purchased the Tax Solver software product created by ATX for sales and use tax calculations. Taxware kept Tax Solver operations in Caribou and currently has a staff of 17 employees including managers, programmers, and customer service professionals all who were originally with ATX. Blue Ox is a two person custom software development firm in Caribou that was started by a former ATX employee.

Burrelle’s Information Services - Started in 1888 in New York City, Burrelle’s Information Services opened operations in Presque Isle 23 years ago. The Presque Isle region was chosen because of the availability of reliable, qualified and affordable labor and the owner’s familiarity with the region. Attractive incentives provided by the State also aided the decision. Burrelle’s is one of the largest companies in its industry providing information services including clipping services of print media, broadcast and Internet media clips, and analytical services. Its clients include major marketing firms throughout the world. Currently headquartered in New Jersey, Burrelle’s Maine presence includes two facilities in Presque Isle, one in Houlton, and one in Belfast. The Presque Isle facilities serve as one of three major national clipping service centers, and the Houlton facility is a branch office of Presque Isle where additional staff readers are located. Combined there are approximately 515 employees at the Presque Isle and Houlton facilities.

Burrelle’s has served as an IT leader organization in Aroostook County by driving demand for connectivity, increased bandwidth and redundancy. Over the last ten years, the information services industry has grow significantly in terms of its use of and reliance on electronic media and Internet services. Because of Verizon’s infrastructure throughout the State and Time Warner’s services and infrastructure within the region, Burrelle’s has been able to meet its IT infrastructure and service needs.

Burrelle’s is in process of upgrading its technology to a state of the art scanning system (hardware, software and networking) for this industry. This $10 million investment will solidify Burrelle’s Presque Isle operations as a central location for the company’s national clipping services and the operators/maintainers of the new technology. Effectively utilizing the new technology will require additional bandwidth and redundancy of services to insure against “down-time”. In order for Burrelle’s to make the investment at the Presque Isle facility, they had to be assured that they could obtain the required bandwidth for the system upgrade and that redundant services would be possible. Currently, the company is working with Time Warner and Pioneer Wireless on proposals to obtain the increased capacity and redundancy through additional connections to services and gateways in New Brunswick, Canada.

In Presque Isle, Burrelle's currently has a staff of ten IT professionals that provide in-house IT services. They anticipate adding 2-3 more staff as a result of the technology upgrade. Once chosen as a location because of access to labor, the region is now being chosen because of its IT infrastructure and services.

Maine Mutual Group - A good example of the importance of companies that are heavy users of IT is Maine Mutual Group (MMG). MMG is a property and casualty insurance company headquartered in Presque Isle and has been in operations in the region for over 100 years. All of the company's policies are sold through independent agents throughout Maine, New Hampshire, and Vermont. MMG has approximately 105 employees in Presque Isle, including 16 IT staff (10 programmers. 5 technicians, and 1 manager). The Presque Isle IT staff is responsible for developing and maintaining all of the company's billing, payroll, claims and imaging software, and hardware and network support and administration. The Presque Isle IT staff serves both the headquarters in Presque Isle and the Company's branch location in Concord, New Hampshire. Heavily dependent on IT connectivity, MMG utilizes Road Runner for broadband services. The availability of broadband in the region is a significant contributor to the MMG being able to meet the demand for services across the entire company. As a leadership organization MMG has also fostered solid working relations with the areas educational institutions particularly the Northern Maine Community College.

All three of the above IT leadership company's in Aroostook County are growth oriented, have developed relationships with the area educational institutions, and export goods and or services outside of the County and Maine bringing revenues and investment into the State.

Market Potential - Local Demand

Because of the relatively small number of businesses in the region, the local demand for IT services is not strong enough at present to generate sufficient activity for a regional cluster. Several small custom software firms indicated that the relatively small size of the County leads to insufficient local demand for products and services to support further growth. In order to grow, the firms must compete in other geographic areas in Maine, outside of the state, and/or across the border in Canada. Furthermore, several interviewees indicated that institutions and businesses that that are heavy users of IT such as financial, insurance, health, and educational institutions, are not generating sufficient investment in the hardware, software, and network upgrades to sustain local providers of these services In several cases when this investment has occurred, it has been accomplished through little or no local contracting.

Although local demand for IT services is not large enough to solely support and IT cluster, several of the smaller IT firms have developed regional and national niches based experience gained in the local market. For example, several of the firms interviewed have developed expertise in providing IT services to the forestry and agriculture sectors (two sectors that have been important traditionally within Aroostook County) by serving local clients. This has helped the companies compete for business in these same industries outside of Aroostook County.

Larger IT or IT-related companies such as ATX and Burrelle's are national in terms of market scope and do not rely on local demand for products and services.

Market Potential -Export Demand

The larger Aroostook IT or IT related businesses have achieved growth primarily by providing products and services to clients beyond Maine. Though, they provide products and services to companies within Aroostook County and Maine, ATX, Taxware, and Burrelle's obtain most of their sales from clients outside of the County and Maine. Burrelle's information services are provided to companies internationally and ATX and Taxware to entities across the US. Maine Mutual sells it products and services to clients throughout Maine, Vermont, and New Hampshire.

Regarding the smaller IT firms offering custom software development, networks, Web design, and computer support services; it was indicated that smaller Aroostook IT firms have a difficult time competing in the central and southern Maine markets because they are viewed by other Maine businesses as being too remote to be serious competitors. This has led some firms to consider nearby Canadian markets as opposed to looking south. Other firms are still looking to compete in central and southern Maine markets. Partnering with firms in and other regions was viewed as an important means for small Aroostook IT firms to compete in other markets.

Potential for relationships with Canadian businesses

One company interviewed has broken into partnering with a Canadian firm offering complimentary services. Still in the early stages, this relationship is seen as providing mutual benefits to the partners, providing each a presence in the others home country. Canadian firms may view Aroostook firms as good partners. They have close proximity and provide the Canadian firm with an "American presence. The same could be said of how Aroostook IT firms might grow to view Canadian partnerships.

While viewed as offering potential and being done by some Aroostook firms, there is not a great deal of activity between Aroostook IT firms and Canadian businesses. The smaller firms indicated a need for greater technical assistance with entering into and developing Canadian business and partnerships.

Data backup and disaster recovery services

Because of the uniqueness of this sector of IT, it warrants separate observations. The data back-up and disaster recovery business is a complex and growing field. It includes consulting, software and hardware. It covers establishing plans for what, where, and how to run a business in the event of a disaster, software products that purport to provide and implement such plans and both equipment and buildings to serve as replacement s for a business that is shut down by a disaster.

The industry operates around two standards: recovery time and recovery point. The first refers to the time by which a customer needs business restored; the second refers to the location where a customer needs a business restored. With recovery time the standard runs from instantaneous (a customer mirrors all data on a duplicate drive at separate location) to 24 hours to 48 hours up to one week. In addition to mirrored disks, recovery strategies include back up made over the phone lines, over satellite connections and by tape physically delivered to a recovery site. For recovery point, standards vary with customer. One example cited by a salesperson was of a major East Coast business that demanded that its disaster recovery site be in Texas, so as to be completely removed from the Northeast. More commonly, businesses want their recovery point to be within 4 hours drive of their original location.

The point here is that the business is very fluid and very rapidly growing. Most of the business is located near major metropolitan areas because of the recovery point standards most businesses set. There is some movement towards smaller regional hubs with mobile units that will bring recovered data to a client. Sungard, for example, maintains its major data recovery centers outside Philadelphia and in New Jersey outside New York. They have recently established two regional centers in Tewksbury and Westboro Massachusetts. Their other major centers are in Montreal and Quebec.

The industry is composed of everything from consultants helping businesses plan for disaster recovery, to software companies making both planning and actual back-up products, to hardware companies to large , integrated companies like Sungard, ATT, IBM and CNT that provide all the services.

The industry is in great flux in that both products and procedures are changing. Financial and health regulators have demanded new document archival and protection systems. As a result, software and hardware companies are developing new products to meet the needs. For instance, EMC has introduced a “write to disk” system that cannot be overwritten as a way of preventing deletion of email.

In sum, the opportunities for Aroostook County seem to be two. The first is the area of software development. If the County offered a sufficiently attractive work environment for security programmers, this is an area where small enterprises could thrive. Second, and more likely is the area of data aggregation. Most large businesses set up their own off-site facilities to meet their own standards. Most small businesses don’t have disaster recovery plans. Aroostook County could establish itself as the disaster recovery Mecca for Northern New England and Maritime Canada by attracting companies to aggregate the disaster recovery needs of many small and mid-size businesses.

Finally, it should be noted that businesses are extremely reluctant to discuss disaster recovery. If they have a plan and back-up sites, they don’t want anyone else to know. If they don’t have a disaster recovery plan, they don’t want anyone to know that either.

Recommended Strategies

- Create and Aroostook IT Identity - Greater focus on marketing of region to promote identity as rural IT region (like New Brunswick). This should be separate from general business marketing of the region and include increased awareness of IT businesses, resources, and infrastructure. This message should be provided to businesses within the County as well as those external to it.

- Increase awareness of the region's IT infrastructure. None of the businesses representatives interviewed for this analysis cited IT connectivity as an obstacle to business growth and development in the County; in fact, several indicated that the wide availability of connectivity options in the County provides their company with advantages over firms located elsewhere in Maine. This story needs to be shared with IT and IT dependent businesses looking for locations to grow.

- Increase potential for information technology R&D in the region. Encourage MTI, SBIR and other similar grant programs; tie into existing R&D centers in Maine Orono, IT Incubator, explore increased R&D activity at UMaine Aroostook Campuses (particularly building on e-commerce and GIS at Fort Kent, and Business MIS at UMPI.

- Build IT Networking/Support Opportunities - Explore coordination with MESDA and New Brunswick IT Association. Consider IT related higher education professionals and students for program participation and delivery, administration, and hosting.

- Market IT locally in addition to other efforts – stimulate local demand from heavy local IT users such as hospitals, education institutions, banks, and not-for-profits. Provide information that lets these entities know that expertise and ability exists locally, promote state of the art among all businesses, integrate IT professional within the larger companies and institutions through user groups and networks.

- Foster linkages between IT companies in nearby Canadian regions and companies in Aroostook. Consider a program to promote stimulate co-location in which a Canadian firms open an Aroostook branch and vice versa. Both companies will benefit by increasing international market share.

- Increase utilization of the regional education Institutions (UMaine Fort Kent, UMaine Presque Isle, the Northern Maine Community College, and the University College in Houlton, as major support institutions for IT.

Technical Notes – Information Technology

The following table lists persons interviewed for the IT cluster analysis along with the company/entity and IT related sector.

IT Sector Interviews Conducted for Northern Maine Development Commission Cluster Analysis			
Contact Name/Title	Company/Organization	IT Sub-Sector	Maine Location (if applicable)
David Olsen, Chief Operating Officer	ATX	Software Development	Caribou, ME
Christopher York, President	Blue Ox Technologies	Custom Software Development	Caribou, ME
Brad Potter, IT Department Manager	Burrelle's Information Services	IT user for Information Services Industry	Presque Isle & Houlton ME
Dottie Wheeler, Vice President, Maine Operations	Burrelle's Information Services	IT user for Information Services Industry	Presque Isle & Houlton ME
Joe McClescal	CNT's Professional Services	Telecommunications Sales	Boston, MA
Peter Thibeault	Delphi Global Services, Inc	Telecommunications Consultant	Hallowell, ME
Joe Wischerath, President	Maine & Company	Statewide Business Attraction	Portland, ME
Stacy Shaw, Information Systems Manager	Maine Mutual Group	IT User for Insurance Industry	Presque Isle, ME
Joe Kumiszcza, Executive Director	MESDA, Maine's Software & Information Technology Industry Association	State IT Industry Association	Statewide programs, Office based in Portland
Dwight Clayton, Director & Instructor, Business Technology Department	Northern Maine Community College	Higher Education	Presque Isle, ME
Todd Player, President	Oak Leaf Systems, Inc.	Network design, implementation, & support,	Caribou, ME
Chris Anderson, President	Pioneer Wireless	Wireless Telecommunications	Houlton, ME
Tim McAffee, Technical Director	Pioneer Wireless	Wireless Telecommunications	Houlton, ME
Mike Hilton	Sun-Gard Availability Services	Disaster Recovery	Boston, MA
Matthew Olson, Software Development Manager	Taxware, Division of govONE Solutions	Software Development	Caribou, ME
Barry McCrum, Former Vice President of Governmental Affairs	Time Warner	Cable Based Telecommunications	Statewide
Stephen C. Jordan, Esq.	Troubh, Heisler & Piampiano, P.A.	IT and Intellectual Property Atty	Portland, ME
Dave Hobbins, Professor of Forestry & Environmental Studies	University of Maine Fort Kent	Higher Education	Fort Kent, ME

IT Sector Interviews Conducted for Northern Maine Development Commission Cluster Analysis			
Contact Name/Title	Company/Organization	IT Sub-Sector	Maine Location (if applicable)
Dan Breton, Director Governmental Affairs	Verizon	Telecommunications	Statewide

Precision Manufacturing

Aroostook has a small but important collection of companies engaged in a variety of precision manufacturing enterprises, most of which use metals machining. Some, such as Acme-Monaco in Presque Isle, are focused on production of medical and industrial wire components, and use traditional metal machining technology. Others, such as First Technology in Caribou, use automation engineering to create sophisticated systems for in-house assembly work. Smith and Wesson uses metals machining in its firearm production and assembly work. A final group of companies uses traditional metal fabrication techniques to serve the area agricultural industry in equipment fabrication and servicing. Metals machining capabilities are also found at lumber mills and production lines in the forest products industry, and in the food processing industry for production line equipment.

The number of companies in the area is too small and too spread out across the County to be considered a cluster. Instead the larger companies here operate as satellites to metals manufacturing clusters in southern New England (Smith and Wesson, Acme Monaco) or more global operations such as First Technology. Other companies such as SFE Manufacturing, which manufactures stainless food service equipment, serve regional and national supermarket chains. As a result, these companies have little or no interaction with the other precision manufacturing companies in the area, so the networks essential for cluster formation have not occurred.

Yet potential exists to expand the network of companies in this industry. A significant metal products industry exists just across the border in the Centreville – Hartland area of New Brunswick. Some of the larger employers in this area include:

Table 14
Precision Metals Firms in New Brunswick

Company	Location	Profile	Employ
Thomas Equipment	Centreville	Forklift manufacturer	290
Craigs Manufacturing	Hartland	Snow Plows	75
Sabian Cymbals	Meductic	Musical instruments	50
Metalfab	Centreville	Fire Trucks	35
BWS Manufacturing	Centreville	Trailers	70

Thomas Equipment and Craig Manufacturing have over 150,000 square feet of manufacturing space and serve national and international markets for heavy equipment. A number of smaller machine shops serve these companies as well as the food processing equipment needs of McCains. Carleton County has over 700 people employed in the metal trades, which is significant in area with a total population of 27,000. While vocational programs are available at some high schools in Carleton County, no advanced training programs for metals manufacturing are located there. The new metals technology program at the Northern Maine Community College may be attractive to companies in this area, and may serve as bridge to industry in this area.

A second asset located in Canada that is used by at least one company in Aroostook is the RPC (Research and Productivity Council), located in Fredericton, NB. This center offers a range of product development services, including prototyping, troubleshooting and product testing. These services are offered to established companies seeking testing or prototyping, as well as to assist entrepreneurs and spur the growth of new enterprises, and payment for services is required only if the project is successful.

Developing the precision manufacturing industry

While Aroostook may lack sufficient companies to have a precision manufacturing cluster, it does have demand for metals machining skills both in local manufacturing companies and as supporting skills for established clusters in forestry, agriculture and food processing. These supporting roles are important for the success of the larger clusters, and help maintain the competitiveness of the industry and the region.

Broadening the skills base in the region will require a phased approach from the metals technology program at the Northern Maine Community College (NMCC), focusing initially on developing training capabilities and meeting the needs of existing companies in the County. Opportunities for apprenticeships and on-the-job training will be most important. Some of the companies interviewed for this report will be able to absorb graduates of this program, including Smith and Wesson. Other companies in the area in forest products industry will likely have need for machinists, as will machine shops such as CAM Manufacturing. As local knowledge and expertise grows, opportunities for starting new companies may also arise.

Once the program at NMCC is better established, it can also play an important role in training for nearby Canadian metal products companies in Carleton County, NB, as well as for companies such as McCains, which have extensive automated production lines requiring upgrade and maintenance. Cross border education is already well established at the University of Maine at Presque Isle and the University of Maine at Fort Kent, and the NMCC could play a similar role in precision manufacturing. Opportunities for training on NMCC state-of-the-art equipment may be attractive for students at other community colleges in Maine.

Also important for the long term growth of manufacturing companies in the area will be improved facilities for training, not only in metals technology but in a wide range of manufacturing fields. Currently NMCC has completed portions of the Business and Industry Training Center, including a conference center and staff support areas. Yet no facilities exist for set-up of demonstrations of equipment, and training in manufacturing typically requires hands-on practice with specialized equipment. This facility would also be useful for specialized training in the health care professions, such as emergency medical technicians, where use of medical equipment is an integral part of the training.

Recruitment of precision manufacturing companies from other regions is a difficult proposition in the current economy. Several key sectors in U.S. manufacturing, including metal products, have suffered in the latest economic downtown. Precision machining companies in southern and central Maine have had a difficult year, with layoffs fairly widespread throughout the sector. Defense related work and armaments remains the only bright spot in a generally weak picture here in Maine. Other types of precision manufacturing that utilize assembly work are increasingly moving overseas due to lower labor costs, as has been the case with First Technology in Caribou.

Recommendations

1. Assist in expanding networks and linkages for NMCC metals machining program– this will include in-state linkages to metals machining programs at CMCC, and the Maine Metal Products Association, as well as to southern and central Maine metals companies. It should also include cross border linkages to Canadian manufacturers in Carleton County, and to Carleton County vocational programs.

2. Assist in developing marketing and promotional materials for NMCC metals programs. While these efforts may take time to produce benefits, they will undoubtedly strengthen the County's' reputation as a center for training, and as a potential location to develop a manufacturing enterprise.

3. Expand training facilities at Northern Maine Community College for specialized training for manufacturing and other professions.

Technical notes – Precision Manufacturing

The following companies were interviewed for this study:

Companies	Location	Contact	Profile	Employ
Acme - Monaco	Presque Isle	Mark Jarrett	Wire products	45
CAM Manufacturing	Presque Isle	Mark Brown	Custom machining	5
First Technology	Caribou	Mark Bouchard	Electronic control devices	75
SFE Manufacturing	Caribou	John Weeks	Stainless food service equip	10-15
Smith and Wesson	Houlton	Terry Wade	handguns	100
NMTC	Presque Isle	Dean Duplissis	Metals machining program	