North Country Council, Inc.
Regional Commission & Economic Development District

Northern Forest Center

High Technology and Knowledge-Based Industry in the Northern Forest Region: A Situation Analysis

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Situational Analysis
The Northern Forest Potential for High Technology & Knowledge-Based Industry Development[1]

I. Introduction

A. Executive Summary

This situational analysis explores the potential for high technology and knowledge-based industry (HT&KB) development in the Northern Forest (NF). It reviews important factors and data for the NF and comparison areas. Its purpose is to inform and to help facilitate stakeholder led processes to identify and choose among sustainable development options for the Northern Forest.

The report reviews detailed data on technology and knowledge-based employment and on workforce and population characteristics most relevant to a high technology and knowledge-based economy. (In an accompanying Powerpoint file figures with detailed data are provided.)

There appears to be some, but limited, potential for high technology and knowledge-based industry development in the Northern Forest. Selective and strategic efforts with an initial focus in NF counties with the highest concentration of current HT&KB-related activity as "NF HT&KB industry hubs" could be beneficial and complement other economic development efforts in the region.

The areas of HT&KB industry greatest strength and development potential include:

- significant entry level work force percentage;
- employment concentration in creative class occupations, particularly education and training, health care and "bohemian" (e.g., artists and writers) categories;
- high self-employment and entrepreneurial activity;
- high concentration of colleges and universities in the region, with bachelor degree completions per capita, including in computer, engineering, math and physical sciences above the national average.

The areas of greatest weakness related to HT&KB industry development include:

- low concentration and base of high technology industry employment;
- low concentration and base of professional and technological services, finance and insurance industries employment;
- low concentration and numbers of computer and math professionals;
- limited ability to attract a diverse population, particularly foreign born, residents.

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[1] *This report was prepared by Ross Gittell, James R Carter Professor at the University of New Hampshire, with the assistance of Jason Rudokas, graduate student in economics at UNH.*

B. Indicators of the potential for HT&KB industry development
There are no single or simple indicators of the potential for high technology and knowledge industry development. Here we use a variety of factor indicators that are (a) consistent with research and theories of technology and knowledge-based industry development and (b) have current data available by county.

Indicators of high technology and know-based industry development and its potential in the NF are considered for the entire NF region and also for geographic areas within the NF, including individual counties and clusters of counties within individual NF states. The NF and areas within the NF are compared to the national average and compared to what we call "exemplary" high technology and knowledge-based industry counties in the region and nationally

II.*Data and Analysis*

A. Definitions

The following data and factors are documented and discussed in this report (detailed category definitions along with employment numbers and percentages of total employment in NF and in US are provided below in tables):

(1) **Industry Employment Concentrations** in (a) high technology, (b) finance and insurance and (c) professional and technical services. (See Tables 1-3 below)

(2) **Workforce Occupational Concentrations**. The concentration of the workforce in what have been characterized as "creative class" occupations, producing new products, ideas and services, and that are self-employed. This includes (a) creative class and sub-classes of (b) super creative class and (c) bohemian occupations. (See Table 4 below)

(3) **Population Characteristics**. The percent of the adult population that have (a) bachelor's degree, (b) are entry level workers, are (c) recent in-migrants, and (d) diverse backgrounds.

(4) **Bachelor Degree Completions**, (a) totals and (b) in the fields most closely aligned with high technology and knowledge based industries --computer science, engineering, math and physical science.

The percentages of NF employment in high technology, professional and technical services and finance and insurance industries provides a profile of the existing foundation of HT&KB industries in the NF. The most current data identifies the current low concentration relative to the US and suggests limited potential for industry clustering and agglomeration in the NF. The definition of these industries is from the North American Industrial Classification System (NAICS) and the US Bureau of Labor Statistics (BLS) and presented in the tables below.

Table 1: High Technology Industries

Naics Code	Industry	NF Employment	NF % of Total Employment	US % of Total Employment
10	*Total*	*722,397*		
3254	Pharmaceutical and Medicine Manufacturing			0.25%
3341	Computer and Peripheral Equipment Manufacturing			0.26%
3342	Communications Equipment Manufacturing			0.22%
3344	Semiconductor and Other Electronic Component Manufacturing			0.61%
3345	Navigational, Measuring, and Control Instruments Manufacturing	1,353	0.19%	0.43%
3391	Medical Equipment and Supplies Manufacturing	510	0.07%	0.28%
5112	Software Publishers	599	0.08%	0.24%
5171	Wired Telecommunications Carriers	936	0.13%	0.66%
5172	Wireless Telecommunications Carriers (except Satellite)	148	0.02%	0.17%
5173	Telecommunications Resellers			0.18%
5174	Satellite Telecommunications			0.02%
5179	Other Telecommunications			0.01%
5181	Internet Service Providers and Web Search Portals	102	0.01%	0.17%
5182	Data Processing, Hosting, and Related Services	90	0.01%	0.30%
5415	Computer Systems Design and Related Services	4,130	0.57%	1.19%
5417	Scientific Research and Development Services	577	0.08%	0.47%
5419	Other Professional, Scientific, and Technical Services	2,587	0.36%	0.42%
6215	Medical and Diagnostic Laboratories	317	0.04%	0.15%

Table 2: Finance & Insurance

Naics Code	Industry	NF Employment	NF % of Total Emp	US % of Total Emp
5211	Monetary authorities - central bank			0.02%
5221	Depository credit intermediation	9,845	1.36%	1.52%
5222	Nondepository credit intermediation	415	0.06%	0.59%
5223	Activities related to credit intermediation	200	0.03%	0.20%
5231	Securities and commodity contracts brokerage	522	0.07%	0.51%
5232	Securities and commodity exchanges		0.00%	0.01%
5239	Other financial investment activities	401	0.06%	0.22%
5241	Insurance carriers	6,988	0.97%	1.19%
5242	Insurance agencies, brokerages, and related	3,690	0.51%	0.71%
5251	Insurance and employee benefit funds		0.00%	0.04%
5259	Other investment pools and funds		0.00%	0.04%

Table 3: Professional and Technical Services

Naics Code	Industry	NF Employment	NF % of Total Emp	US % of Total Emp
5411	Legal services	4,774	0.66%	0.97%
5412	Accounting and bookkeeping services	3,805	0.53%	0.79%
5413	Architectural and engineering services	4,828	0.67%	1.13%
5414	Specialized design services	413	0.06%	0.12%
5415	Computer systems design and related services	4,130	0.57%	1.19%
5416	Management and technical consulting services	2,086	0.29%	0.65%
5417	Scientific research and development services	577	0.08%	0.47%
5418	Advertising and related services	852	0.12%	0.45%
5419	Other professional and technical services	2,587	0.36%	0.42%

The creative class is not as easily defined or understood as the NAICS industry sectors. However, it is important to HT&KB industry development particularly in areas like the NF. The concentration of creative class workers in an area is indicative of the attraction and quality of a place. In an increasing global and Internet connected economy, the quality of places strongly influence their economic futures. Workers, and particularly highly skilled creative class workers in high demand, choose to work where they want to live. The creative class can contribute directly to regional economies, through their new ideas, products, services and businesses and also in-directly by their presence they can contribute to the quality of life of an area and thus can help retain and attract to the area other highly skilled workers, including skilled high technology workers.

The creative class comprises a (mostly) highly educated and well-paid segment of the labor market and includes workers from diverse backgrounds. It includes educators, health care providers, scientists, software developers, musicians, architects, and analysts, to name just a few. According to Richard Florida, the economist and, author of *The Rise of the Creative Class*, creative class workers are an essential component of the economic viability of regions. Generally regions with significant numbers and concentration of creative class workers become centers of knowledge and new creative activities that can spur the economic success of a region. Richard Florida's occupational definitions of creative class and its subsets, the super creative class and bohemians, are presented in Table 4. The data indicates that Northern Forest has current strengths and potential to further develop its creative class economic base.

Table 4: Creative Class Occupations

	NF		US
	Employment	**% of Total Employment**	**% of Total Employment**
Total Occ Employment	***1,028,437***		
Total Creative Class	**347,991**	**33.8%**	**36.0%**
Super Creative Core	**131,252**	**12.8%**	**13.0%**
Computer and mathematical occupations:	13,790	1.3%	2.4%
Architecture and engineering occupations:	18,878	1.8%	2.1%
Life, physical, and social science occupations:	9,083	0.9%	0.9%
Education, training, and library occupations:	73,314	7.1%	5.7%
* Arts, design, entertainment, sports, and media occupations:	16,187	1.6%	1.9%
Creative Professionals	**216,739**	**21.1%**	**23.0%**
Management occupations:	83,099	8.1%	9.2%
Business and financial operations occupations:	33,615	3.3%	4.3%
Legal occupations:	7,368	0.7%	1.1%
Healthcare practitioners and technical occupations:	52,651	5.1%	4.6%
Other sales and related occupations, including supervisors	40,006	3.9%	3.9%

** Bohemian occupations*

The data on the percentages of the adult population that are self-employed, have bachelors degrees that are entry level workers, are recent in-migrants, and have a diverse background can complement and add to the industry employment and creative class data. It provides information on some of the NF population characteristics that will be most relevant to the potential for future HT&KB industry development. On the population characteristics the NF has some strength and some weaknesses, see Table 5 and the discussion and analysis in section IIC below.

Table 5: Population data	Population 25-44	Bachelors or Higher	Self Employed Workers	Foreign Born
NF numbers	641,653	311,739	113,470	
NF %	29.0%	21.2%	11.0%	3.4%
US %	30.4%	24.4%	9.8%	11.1%

All together these data provide a comprehensive picture of the current concentration of high technology and knowledge-based employment and characterize the potential of the population to engage effectively in the HB&KT economy and for the NF to retain and attract those engaged in HB&KT and related activities.

B. Comparisons and identification of factors with the greatest and least potential

For each indicator (described above) we compare the 34-county NF average to:

- the NF county averages within the 4 states
- Top 3 and Bottom 3 ranked NF county averages
- Top and Bottom average among the 4 states that comprise the NF
- Top exemplary county (from among Boulder, Colorado; Durham, North Carolina; Garrett, Maryland; Cumberland, Maine; Rockingham, New Hampshire; and Suffolk, Massachusetts)

The indicators with the greatest potential as technology and knowledge-based industry economic development assets will have the following characteristics:

- NF average close to or above the national average
- NF top 3 average above the US average
- Low variance among NF counties, e.g. small percentage gap between Top 3 and Bottom 3 average
- NFs within at least one of the states close to exemplary county level

The indicators with the least potential as technology and knowledge-based industry economic development assets will have:

- NF average significantly lower than the national average
- NF top 3 average lower than the US average
- High variance among NF counties, e.g. high percentage gap between Top 3 and Bottom 3 average
- No single state NF cluster close to exemplary county level

C. Indicator Data

1) Industry Employment Concentration:

The NF region has relatively low presence and employment concentration in High Technology industries (see Table 1 above and Figure 1 in the accompanying Powerpoint file). This is a significant shortcoming. The region has less than one-half the US average concentration in high technology employment. In the NF 2 percent of total employment is in high technology industries compared to the national average of 5.3 percent. The top 3 NF average is 4.4 percent, a level below the US average. And there is no significant NF cluster in any of the 4 NF states.

Within the high technology sector, the largest employers in the region and the high technology industries with the greatest potential to grow in the NF are businesses in computer system design and related services and high technology related professional, scientific and technical services, such as marketing research, photographic services and translation services. While these industries are relatively large employers in the NF, the percent of total employment in these industries in the NF is well below the US average.

Finance and Insurance industry employment concentration is also significantly lower in the NF than the US average (Table 2 and Figure 2). The US average employment in the finance and insurance industry is 5.1 compared to 3.4 percent in the region. The top 3 NF counties have an average concentration (6.6 percent) that is above the US average, but well below the exemplary county (Suffolk) percentage, 11.8 percent. The largest employers in this sector in the NF are businesses engaged in depository credit intermediation and insurance carriers and brokers. These industries are relatively large employers in the NF, yet the percent of total employment in these industries in the NF is below the US average.

Professional and Technical Services employment concentration is also low in the NF region (see Table 3 above and Figure 3 in Powerpoint). This is the third main sector that will be challenging to develop as part of HT&KB industry development. It is a sector that overlaps with the high technology sector (see discussion above of computer system design and high technology related professional, scientific and technical services). The NF employment concentration in professional and technical services is 3.3 percent compared to the national average of 6.1 percent. The top 3 NF county average is slightly above the US average at 6.7 percent. However, there is no cluster in any of the NF states above the US average.

Within professional and technical services the largest employers in the region and the industries with the greatest potential to grow in the NF are architectural & engineering and accounting & bookkeeping services, computer system design and related services, professional, scientific and technical services and management & technical services. While these industries are relatively large employers in the NF the percent of total employment in these industries in the NF is well below the US average.

2) Workforce Occupational Concentration:

Compared to the HT&KB industries, the NF has relatively strong potential and high concentration in Creative Class occupations (Figure 4). The concentrations are similar to the US average, 33.8 compared to 36 percent. In Vermont's NF counties the creative class concentration (39.7 percent) is higher than the national average and the top 3 NF counties have an average percentage (43.6) well above the US average.

Of particular note, within the creative class, Health Care Occupations concentration is higher in NF (5.1 percent) and in all NF states than the US average, 4.6 percent (Figure 5). Health care workers in the NF serve local residents and also a larger population, including summer visitors and retired home owners with primary residents elsewhere.

The relatively strong current position and the potential for growth are also evident in Super Creative Class occupations (Figure 6). The super creative class occupational percentages of the workforce in the NF are very close to the US average, 12.8 compared to 13 percent. In the Vermont (16.2) and New Hampshire (13.4) NF counties the percentages are higher than the national average and the top 3 NF counties have an average percentage of 17.8 percent which is well above the US average.

Within the super creative class, Education & Training occupations have particularly high concentration in the NF relative to the US average, 7.1 compared to 5.7 percent (Figure 7). In addition, the top 3 NF counties on average have a concentration close to the top exemplary county, 7.5 compared to 8.2 percent.

In contrast, there is a significant weakness in the super creative class category of Computer & Math related occupations (Figure 8). In these occupations NF counties have about one-half the average US concentration of employment, 1.3 compared to 2.4 percent. The top 3 NF county average (3 percent) is above the national average, but there is no significant concentration in the NF any of the states.

The Bohemian occupational concentration in NF is significant and suggestive of the potential for future growth and development (Figure 9). Bohemian workers can be attracted to the unique quality of life, including natural resources and recreational amenities, in the region. The bohemian concentration in the NF is close to the US average, 1.6 compared to 1.9 percent. In Vermont (2.2 percent) and New Hampshire (2 percent) NF counties the bohemian concentrations are higher than the national average and the top 3 NF counties have average concentration well above US average at 2.6 percent.

There are mixed findings regarding Self-Employment in the NF (Figure 10). While there appears to be significant self-employment initiative in the region, relatively low average earnings of the self-employed are suggestive of self-employment based on a lack of good alternatives. The percentage of workers that are self-employed is higher in NF than US average. Eleven percent of workers in the NF are self-employed compared to the national average of 9.8 percent. The top 3 NF counties have a population percentage of self-employment of greater than the top exemplary county, 19.1 compared to 13 percent. However, self-employed workers average earnings in the NF are significantly below the national average, $31,800 compared to $43,500 and none of the NF states have average self-employment income above the national average (Figure 11). This suggests that many of those self-employed in the region are self-employed out of economic necessity rather than economic opportunity and that most of the self-employed are not operating HT&KB establishments.

3) Population Characteristics:

Unlike many rural areas, the NF region has a relatively strong base of young –workforce entry level—residents. This can be of benefit for HT&KB industry development. The region's percentage of the population 25-to-44 is very close to the US average, 29 compared to 30.4 percent (Figure 12). Most importantly the top 3 NF county average (31.9 percent) is well above the national average and there is relative parity in the percentage of young adults across the region.

While the percentage of younger residents can be relatively beneficial for HT&KB industry development this is not true with the general level of educational attainment. The NF population's level of educational attainment is significantly below that of areas with high concentration of NT&KB industries. This will be a significant barrier to HT&KB industry development going forward as HT&KB industries require a highly educated workforce. The percent of population with a bachelor's degree in the NF is below the US average, 21.2 compared to 24.4 percent (Figure 13). There are significant concentrations of highly educated people in the NF. Vermont (30.5) and New Hampshire (26.3) NF counties have above the national average percentages of the population with a bachelor's degree. However, there is wide variance among the NF counties with the top 3 counties averaging 36.8 percent compared to bottom 3 at 11.7 percent.

There is a "disconnect" and lost opportunity in the region with higher education. While the educational attainment of residents is below the national average, the region has a relatively high concentration of bachelor's degree awarding institutions. This suggests some potential to increase the percentages of residents with a college degree. This will require the retention of more graduates of NF institutions and more NF high school graduates matriculating at colleges and universities in the region.

Degrees awarded at 4-year colleges as a percentage of the total population in the NF is well above the US average, .79 compared to .45 percent (Figure 14). It is highest in NH (1.05 percent) and VT NF (.96) counties but above the national average in all the states. Of significant note, and potentially beneficial to the future development of HT&KB industries is that computer science, engineering, math and physical science degree completions at 4-year colleges as a percentage of the total population in the NF is above the US average, .07 percent compared to .05 (Figure 15). It is highest in NH (.12) and NY NF (.08) counties. However, as with total bachelor's degrees per capita there is wide variance among the NF counties

The Diversity of the population (as with the concentration of employment in creative class occupations) can be indicative of the quality of place, the attraction of a region to outsiders, and of the openness/tolerance of a region's residents to new people, new ideas and new economic activities. On these measures the NF does not fare well compared to most HT&KB industry centers.

In terms of the percentage of the population Foreign-Born, NF counties have one-third the average US percentage, 3.4 compared to 11.1 percent (Figure 16). The top 3 NF counties average (5.8 percent) is only one-half the US average and there is no significant foreign born cluster in any of the NF states. The Gay population percentage in the NF is at the US average, .23 percent (Figure 17). In Vermont, New Hampshire and Maine the NF counties percentages are higher than the US average and the top 3 NF county average (1.2 percent) is well above US average and also the exemplary county.

Another measure of attraction of an area is net migration both domestic and international. On net domestic migration, in contrast to many technology centers and exemplary counties, the NF has significant net out-migration (Figure 18). Yet, some counties in the NF have been attracting new residents. New Hampshire and Vermont NF counties have positive domestic migration. In addition, the top 3 NF counties average net domestic in-migration as a percentage of total population (9 percent) during the 1990s comes close to the exemplary county high (10.3 percent in Boulder). On international migration as a percentage of the total population NF counties have one-fourth the average US percent, .7 compared to 3 percent (Figure 19). The top 3 NF counties average (2.2 percent) is also less than the US average and there is no significant cluster in any of the NF states.

III. Summary of Findings

A. "Cross-County" summary:

There are a small number of counties in the NF which dominate the top rankings across the indicators (Figures 20A-C). Chittendon ranks among the top 3 NF counties in 13 of the 18 indicator categories. Washington (Vermont), Saratoga and Grafton are among the top 3 NF counties in 7, 7 and 6 respectively of the categories. Just 8 of the 34 NF counties rank in the top 3 on at least two factors. These counties, and the fact that the top ranked counties are in 3 of the 4 NF states, indicate the potential for HT&KB development in the NF.

The low ranking counties are less concentrated (Figure 20D). There are 12 counties that rank in the bottom 3 of NF counties on at least two of the indicators. This is suggestive of the barriers and difficulties of HT&KB development broadly in the NF. Hamilton County ranks in the bottom 3 on 7 of the categories, Coos, Essex (Vermont) and Lewis on 5 each.

B. Overall Statistical Summary:

To assess the potential for HT&KB development we review the indicators using the following statistical summary metrics:

- NF/US Average --- "NF average" potential
- Bottom 3 NF Average /Top 3 NF Average -- variance among NFs
- Top NF/Exemplary – potential
- Top 1-state NF/Exemplary – cluster potential

Figures 21 and 22are meant to, in a relatively simple summary manner, reveal the NF HT&KB development strengths. The indicators for which NF is most strongly positioned will be those with the highest ratios of NF performance relative to the US average and exemplary counties (Figure 21) and with the least variance and the highest parity ratios among counties within the NF (Figure 22). These are presented for all the factor indicators below.

Figure 21: Factor Indicator Ratios Compared to US and Exemplary

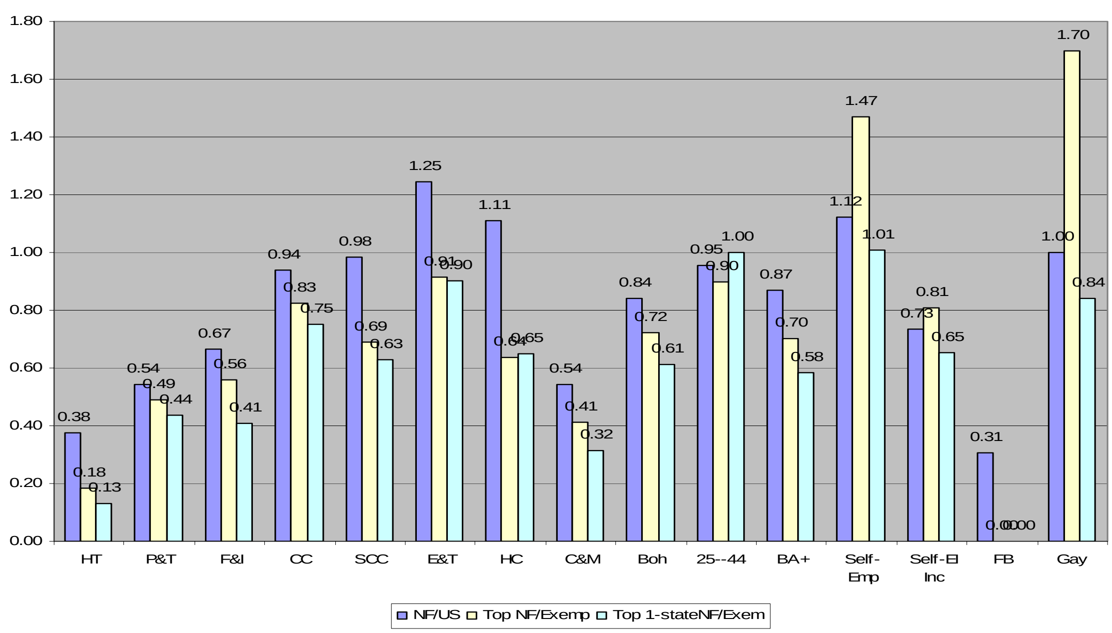
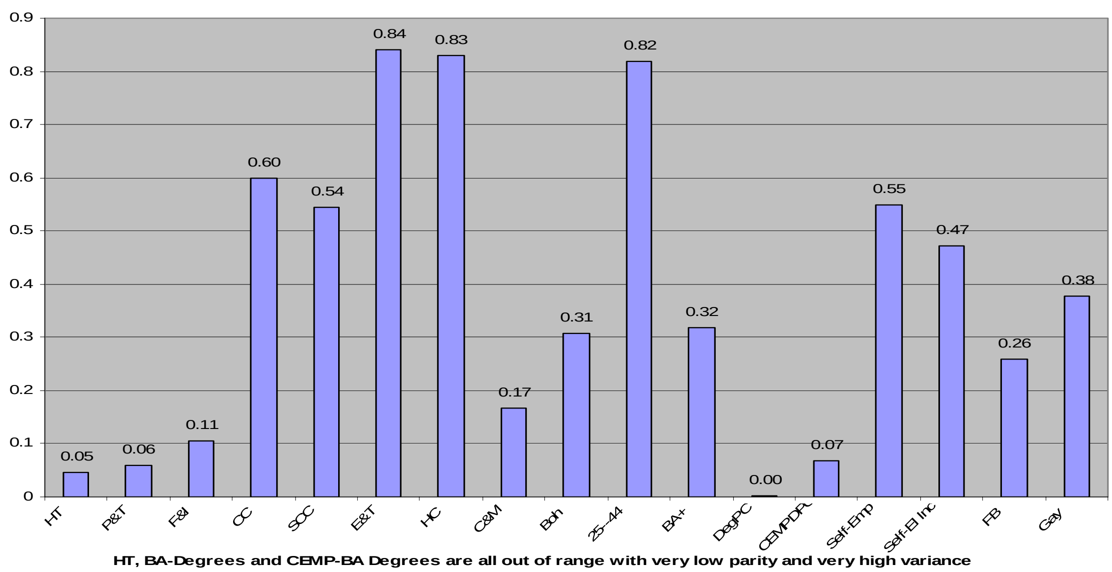


Figure 22: Parity (low variance) Ratios: Within NF



C. Potential HT&KB industry development strengths, weaknesses and strategies

It is important to identify and act on HT&KB industry development strengths and address weaknesses. First we focus on the strengths.

The factor areas of strength can be used to help retain and recruit HT&KB industries and creative class worker-residents. The strengths can be documented and promoted in development efforts. The current strengths can also be enhanced with local development initiatives, examples of which are suggested below.

The factors of <u>greatest strength and development potential</u> are:

- Creative Class (CC) occupation concentration, with relatively high factor indicator ratios between .94 and .75 (Figure 21) and high parity of .6 (Figure 22). The ratios and parity are particularly high within creative class occupations of education and training (E&T), 1.25 to .9 and .84 and health care occupations (HC), 1.11 to .64 and .83.

- Entry Level Work Force, 25-44 year old base population (25-44), with high indicator ratios (1 to .9) and high parity (.82).

- Bohemians (Boh) such as artists and writers, with relatively high indicator ratios (.84 to .61) but relatively low parity (.31).

- Self-employment/entrepreneurial environment (Self-Emp), with indicator ratios ranging from 1.47 to 1.01and relatively high parity of .55. However, average self-employment income (Self-Emp Inc) is not strong, with indicator ratios ranging from .81 to .65 and parity below .5.

• Bachelor degree completions per capita (BA+), including computer, engineering, math and physical science degree graduates is also a strength. (Data by county was not extracted so ratios were not computed.)

These strengths can be used and enhanced in HT&KB development activities. For example, the identification of relatively high concentration of education and training and health care highlights the potential for partnering with large institutions in education and health care fields in the NF. This could include major employers in the NF with a significant stake in and resources for high technology and knowledge-based related development, such as hospitals, colleges and universities and state and local government. These institutions are place-dependent, they are directly impacted by the region's economy and they can not move.

These institutions, for example, could take the lead with the:

- *recruitment back of alumni, graduates from colleges and university in the area*
- *retention of young graduates from colleges and universities in the NF*
- *leveraging proximity to state capitals and knowledge-based industry centers with transportation and information technology infrastructure development.*

To enhance the potential for HT&KB industry development weaknesses must also be recognized and wherever possible addressed. The areas of greatest <u>weakness</u> are:

• Low high technology industry base (HT), with indicator ratios all below .4 and very low parity. This weakness will be a (if not the most) significant challenge going forward. It will be difficult to grow this industry sector from such a disadvantaged position, particularly with all the competition among US regions for a relatively slow growing (one percent in the US last year) base.

• Lack of concentration in professional and technological services (with indicator ratios all below .54 and low parity) and finance and insurance industries (with indicator ratios all below .67 and low parity). As with high technology employment in general, it will be hard to attract businesses in these sectors into the NF given the low existing presence.

• Relatively few computer and math professionals (C&M), with indicator ratios all below .54 and low parity. This weakness will make it difficult to attract and grow businesses, such as software and engineering firms, that rely on these types of skilled professionals. However, this weakness might be addressed with partnerships with colleges and universities in the region. The partnerships could be focused on retaining computer and math degree graduates in the region and could include helping graduates, alumni and research faculty start businesses and to find employment with existing businesses in the region.

• Limited ability to attract foreign born (FB), with indicator ratios all below .31. This will be difficult to address/improve. It is hard to start from a low base to attract foreigners and an international population into the area.

Finally, the factors that are currently *mixed*, i.e., are in general currently not strengths but might be in the future with some development effort focus, include:

- Educational attainment of the workforce (BA+) with indicator ratios between .87 and .58 and parity of .32. There are counties in the NF were the percentages of adults with bachelor's degrees are relatively high and working with local colleges and universities (see above) this could be expanded.

- Open-mindedness to diverse populations and recruitment into the NF of more super creative class and bohemian workers (Gay & FB combined). While the indicator ratios are high for Gay population (all above .84) they are low for foreign born. There is the potential to attract a more diverse population to the NF with the attractions of the natural environment, recreational amenities, bohemian presence and the unique quality of life in the region.[2]

D. Conclusion:

In conclusion, there appears to be some but limited potential for high technology and knowledge-based industry development in the Northern Forest. Selective and strategic efforts with an initial focus on counties -- including Chittenden, Washington (Vermont), Saratoga and Grafton -- with the greatest current concentration of high technology and knowledge-based industry activity could be beneficial and complement other economic development efforts in the NF.

[2] Migration data could not be presented as ratios because of positive and negative figures across the NF.

Appendix A: Data Definitions and Sources

The variables used in the Northern Forest analysis were obtained from the Census 2000 SF3,SF4 and the BLS Quarterly Census of Employment and Wages. The table below describes each of the variables and the relevant population universe.

- Percentage of the Population 25 years or older with a Bachelors degree
    - Includes Bachelors, Masters, Professional and PhDs
    - Universe: Population 25 years or older
    - Source: Census 2000 SF3
- Percentage of the population born in another country
    - Includes both naturalized citizens and non-citizens
    - Universe: Total Population
    - Source: Census 2000 SF3
- Percentage of unmarried partner households (Gay population)
    - Includes male householder with male partner and female householder with female partner
    - Universe: All households
    - Source: Census 2000 SF4
- High-Tech employment as a percentage of total industry employment
    - See below for high-tech definition
    - Universe: Total Private owned industry employment
    - Source: BLS Quarterly Census of Employment and Wages
- Percentage of the Population between 25 and 44
    - Universe: Total Population
    - Source: Census 2000 SF3
- Occupational employment as a percentage total occupational employment
    - See below for creative class employment categories
    - Universe Total Occupational employment
    - Source: Census 2000 SF4
- Net International and Domestic migration 1990-1999 as a percentage of 1990 population
    - Source: Census Population Estimate Program; "State/County Population Estimates and Demographic Components of Population Change"
- Self-Employed workers as a percentage of total industry employment
    - Includes self-employed workers in own unincorporated and incorporated businesses
    - Source: Census 2000 SF3
- Average Self-Employment Income
    - Aggregate SE Income divided by total SE workers
    - Universe: Aggregate income is reported on a HH basis
    - Source: Census 2000 SF3
- Bachelor degree completions (Total and Computer/Information, Engineering, Mathematics, Phys Sci, CEMP)
    - Source: IPEDS 2000 Data set See below for link to data source

Data Sources:

http://www.census.gov/popest/archives/1990s/ (Net Migration Data)

http://factfinder.census.gov/servlet/DatasetMainPageServlet?_program=DEC&_submenuId=datasets_0&_lang=en (SF3, SF4 Datasets)

ftp://ftp.bls.gov/pub/special.requests/cew/ (BLS QCEW High Tech Data)

http://nces.ed.gov/ipedspas/dct/download/index.asp?Begin=1 (Bachelor Degree Completions)