

Local Area Economic Dependencies and Multipliers for Islands Trust Areas

- - Garry Horne -
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BC STATS

Ministry of Labour
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Introduction

BC Stats was approached by the Islands Trust to provide statistical information in the form of income and employment dependencies for the British Columbia islands for which the Islands Trust is responsible. The Islands Trust is a public agency set up by the provincial government in 1974 to preserve and protect the trust area for the benefit of its residents and of the province generally in cooperation with municipalities, regional districts and other organizations. The Islands Trust area covers the islands and waters between the British Columbia mainland and southern Vancouver Island. It is composed of 13 major islands and more than 450 smaller islands and has a total population of about 23,000 people.

The work was carried out by Garry Horne under contract to BC Stats and this report describes the results obtained from that effort.

The Model

The British Columbia Local Area Economic Model was first developed at BC STATS in the mid 1980's. It has been updated and revised a number of times since then. It relies on a multitude of data sources but primary among them is the Canadian Census. Because the Census is conducted at five-year intervals there has been a major overhaul of the model following the release of data from each census. The most recent revision was in 2003 and relied on data from the 2001 Census.

One outcome of the 2003 model revision was the publication *British Columbia's Heartland at the Dawn of the 21st Century* (BCH). (This release is available for download at the BC Stats website. Go to http://www.bcstats.gov.bc.ca/pubs/econ_dep.asp.) That report continued the tradition of developing economic dependencies and employment ratio multipliers for 63 local areas in the province. These areas are non-overlapping and cover the entire province with the exception of the greater Vancouver area. The report discusses many of the methodological issues in this work and provides results for the identified 63 local areas. The most recent report also extends the work in a number of directions.

While the information in the report answers many economic questions for many local areas in the province, sometimes the industries or geographical areas under scrutiny differ from those selected for inclusion in the report. In these cases it may still be possible to develop similar economic information by accessing the model directly. This is the situation described in this study.

The Geography

The Islands Trust is responsible for 13 major islands lying off the British Columbia coast. In alphabetical order, these islands are: Bowen, Denman, Gabriola, Galiano, Gambier, Hornby, Lasqueti, Mayne, North Pender, Salt Spring, Saturna, South Pender, and Thetis. Ideally, this assignment would have developed the desired economic information for each of the major islands. Unfortunately, this has not been possible due to data limitations.

The Census data that the model relies on is disaggregated to the level of what are called Census Subdivisions (CSD). Each municipality in the province is a CSD and there are also rural CSD's between the towns. The local areas reported on in BCH are in turn comprised of one or more CSD's – usually a town and some of the area that surrounds it. For many applications this provides information that is both meaningful and useful.

Unfortunately, the boundaries of CSD's as defined for the 2001 Census are not ideal for developing separate statistics for each of the islands in the Islands Trust. In some cases a single CSD is used for a number of adjacent islands and in other cases a particular CSD may combine data from both an island and part of the mainland or Vancouver Island. These data limitations have forced this analysis to make some necessary compromises in reporting the desired economic information.

In particular, the model has been applied to the following islands (or island groups):

- (1) Bowen Island – this is a standalone CSD
- (2) Gabriola Island – this is a standalone CSD (Nanaimo B)
- (3) Lasqueti Island – this is a standalone CSD (Powell River E)
- (4) Denman & Hornby Islands combined – together these comprise Comox-Strathcona K
- (5) Galiano/Mayne/Saturna/North & South Pender Islands combined – altogether these comprise Capital G

Salt Spring Island was analyzed previously and those results were provided to Gary Holman in 2004.

Unfortunately, with the information in hand, it is not possible to develop reasonable statistics for either Gambier Island or Thetis Island.

The Results

The principal results of this study are shown in 5 tables at the end of this report, one for each of the islands or island groups. The following notes should help to explain what the numbers in the tables mean.

The top half of each table is a section called “Dependencies”. The fundamental premise underlying the model is that activities that bring money into the community from outside are what drive the local economy. We call these “basic” industries. Nonbasic activities

that provide goods and services to local residents are important but are not considered to drive the economy. Thus, in this view, a community is 100% dependent on the basic industries. The Dependency section of each table is the model's view on how this dependency is distributed to each of the basic sectors.

The column headings in this section are:

FOR = Forestry and Related Processing and activities that support those local industries

MIN = Mining and Related Processing and activities that support those local industries

F&T = Fishing, Trapping and Related Processing and activities that support those local industries

AG&FD = Agriculture, Food and Related Processing and activities that support those local industries

TOU = Tourism including all of Accommodation, and parts of retail, food services, transportation and personal services

HITECH = High Tech industries including parts of manufacturing and technical services like software development

PUB = Public Sector including healthcare, education, policing and public administration

CON = Construction (autonomous)

FILM = film and sound recording production

OTH = Other industries that are deemed to be basic but that do not fit logically into any of the other categories

TRAN = Transfer payments to local residents (primarily social assistance, employment insurance, Canada Pension/ Old Age Security)

ONEI = Other Non-employment Income including primarily investment income and non-government pensions

NONB = Nonbasic Industries are community activities that provide services to the residents

There are three pairs of rows in the Dependencies section. The first pair is about Employment in each of the identified sectors, including Nonbasic. Note that by definition there are no employees in either TRAN or ONEI. For the purposes of this study, it has been assumed that each person who earned any income in a particular way during the previous year is employed in that industry. For this reason, these employment estimates may be somewhat larger than those from other sources if the latter are attempting to count "full-time equivalent" jobs. The first row in the table is the actual count of persons employed in the column activity and the second row is the percentage of the basic employment that is in each column activity.

The second pair of rows is concerned with the distribution of before-tax incomes, expressed in millions of dollars (row 3) and as a percentage of total basic before-tax income (row 4).

The third pair of rows in the Dependencies section has similar information for after-tax incomes. After-tax incomes are particularly important in the model because of the assumption that it is the spending of after-tax income that drives the nonbasic sector in

the local economy. The figures in row 6 of this table are directly comparable to the “income dependencies” found in Table 2.1 of BCH.

The bottom part of each table is a set of three rows under the heading EMPLOYMENT IMPACT RATIOS. The numbers in this table are normally referred to as multipliers. They are estimates of the change in total employment that will result from a unit change in direct employment in the column industry under three different assumptions. The “indirect” row provides ratios that estimate job impacts relating only to purchases by the industry (but not spending of incomes by wage-earners in that industry). The second and third rows provide ratios that include the spending of wage-earners in the local economy under two different assumptions. The “No Migration” case assumes that in the event of a change in employment in the direct industry there is no in- or out- migration – if people lose their jobs they will stay in the community and rely on EI or social assistance or savings. The comparable assumption for job gains is that newly hired persons were already living in the community. The “Migration” scenario is much more severe – it assumes that anyone who loses a job leaves the community (or, anyone who gets a newly created job moves to the community) – and the multipliers are correspondingly larger.

As an example, consider the three employment ratios for Tourism on Gabriola Island. These are:

Indirect: 1.08
 No Migration: 1.14
 Migration: 1.23

The first number means that for each 100 jobs that are directly associated with Tourism there are 8 other jobs on that island that support those tourist-related activities without normally being considered as “tourism” jobs. These might include business services hired by tourist operators or wholesale or retail trade outlets that sell goods to tourist operators. (Retail trade to tourists themselves would be considered in this work to be “direct” tourism.) The second number (1.14) estimates that if there is a change of 100 direct tourism jobs this will cause a change of another 6 jobs resulting from the income change in the community under the assumption that the population of the island doesn’t change. Finally, the last number (1.23) means that in addition to the 6 indirect jobs there would be 15 more jobs (lost or gained, depending on the direction of the change) if people move in to take new jobs or move out when jobs are lost.

There are three other numbers provided on each table. For discussion purposes they are displayed again in the table on the next page.

| Area | Diversity Index | Forest Vulnerability Index | Direct Tourism Ratio |
|---------------------|-----------------|----------------------------|----------------------|
| Bowen Island | 68 | 2 | 5.60 |
| Gabriola Island | 67 | 1 | 3.36 |
| Lasqueti Island | 64 | 2 | 2.56 |
| Denman/Hornby | 68 | -1 | 3.42 |
| Galiano/Mayne et al | 62 | 0 | 3.44 |

The diversity index is a measure of the economic diversity of the area. Higher scores indicate greater diversity. Table 2.3 in BCH displays the Diversity Indices for the 63 local areas defined in that report. They range from a high of 76 for Ashcroft to a low of 52 for Port Hardy. The average value in 2001 was 67.

The Forest Vulnerability Index (FVI) combines dependence on Forestry with diversity to provide an index that indicates how vulnerable the community in question is to downturns in the local forest sector. A higher number shows greater vulnerability and numbers close to zero show virtually no such vulnerability. Table 2.4 in BCH displays the Forest Vulnerability Indices for the 63 local areas defined in that report. This index has been normalized so that the most vulnerable local area in the province is 100 (Port Hardy) and the least vulnerable local area is 0 (the Gulf Islands and Victoria tied). Other FVI values in the province are Quesnel at 78, Hazelton at 51, Ladysmith at 25 and Vernon at 10.

The direct tourism ratio is a figure that may be useful to analysts trying to estimate the amount of direct tourism employment in an area. The latter is particularly difficult to estimate accurately because many of the services that tourists use (for example, food services, transportation services, and retail trade) are also used by residents. One of the many challenges in this work has been to split such services between Tourism and Nonbasic. The Direct Tourism Ratio is a by-product of the analysis behind that splitting. It is, by definition, Total Direct Tourism Employment divided by Direct Employment in Accommodation Services. The latter is assumed in the model to be entirely due to Tourism. Thus, for example, the Direct Tourism Ratio of 3.36 for Gabriola Island just means that for every job in accommodation services on that island there are another 2.36 jobs that directly owe their existence to tourist spending – these will be in restaurants, retail establishments, transportation services, etc. Table 2.5 in BCH shows values of this parameter for the 63 local areas defined in that report.

TABLE 1

AREA: Bowen Island
CSD INDEX NUMBERS: 112

| | DEPENDENCIES | | | | | | | | | | | | | TOTAL |
|-------------------------|--------------|-----|-----|-------|-----|--------|------|-----|------|-----|------|------|------|-------|
| | FOR | MIN | F&T | AG&FD | TOU | HITECH | PUB | CON | FILM | OTH | TRAN | ONEI | NONB | |
| Employment | 27 | 13 | 0 | 17 | 159 | 168 | 423 | 122 | 92 | 197 | 0 | 0 | 516 | 1,735 |
| % | 2 | 1 | 0 | 1 | 13 | 14 | 35 | 10 | 8 | 16 | 0 | 0 | | |
| Before-Tax Income (\$M) | 2.2 | 0.1 | 0.0 | 0.1 | 2.8 | 7.8 | 16.9 | 3.6 | 6.7 | 7.6 | 6.0 | 19.7 | 21.7 | 95.2 |
| % | 3 | 0 | 0 | 0 | 4 | 11 | 23 | 5 | 9 | 10 | 8 | 27 | | |
| After-Tax Income (\$M) | 1.7 | 0.1 | 0.0 | 0.1 | 2.5 | 6.4 | 14.1 | 3.2 | 5.2 | 6.1 | 5.4 | 16.1 | 17.7 | 78.7 |
| % | 3 | 0 | 0 | 0 | 4 | 10 | 23 | 5 | 9 | 10 | 9 | 26 | | |

DIVERSITY INDEX: 68
FOREST VULNERABILITY INDEX: 2
DIRECT TOURISM RATIO: 5.60

| | EMPLOYMENT IMPACT RATIOS | | | | | | | | | | | |
|--------------|--------------------------|----------------|-------------|------------|--------------|------|--------------|----------------|-------|-------------|--------------|--------------|
| | LOG- GING | PULP& PAPER | WOOD MFG | MIN ING | HIGH TECH | AGR | TOUR- ISM | PUBL SECTOR | CONST | MIN PROC | FILM PROD | FISH -ING |
| Indirect | N.A. | N.A. | 1.20 | 1.33 | 1.02 | 1.15 | 1.08 | 1.13 | 1.26 | N.A. | 1.23 | N.A. |
| No Migration | N.A. | N.A. | 1.58 | 1.36 | 1.16 | 1.17 | 1.13 | 1.24 | 1.37 | N.A. | 1.56 | N.A. |
| Migration | N.A. | N.A. | 1.84 | 1.42 | 1.35 | 1.20 | 1.22 | 1.45 | 1.54 | N.A. | 1.82 | N.A. |

AREA COMPONENTS

112 Bowen Island IM

2003 BC Community Dependency Model
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TABLE 1

AREA: Denman & Hornby Islands
 CSD INDEX NUMBERS: 180

| | DEPENDENCIES | | | | | | | | | | | | | TOTAL |
|-------------------------|--------------|-----|-----|-------|-----|--------|-----|-----|------|-----|------|------|------|-------|
| | FOR | MIN | F&T | AG&FD | TOU | HITECH | PUB | CON | FILM | OTH | TRAN | ONEI | NONB | |
| Employment | 44 | 0 | 17 | 107 | 147 | 16 | 308 | 128 | 0 | 63 | 0 | 0 | 210 | 1,040 |
| % | 5 | 0 | 2 | 13 | 18 | 2 | 37 | 15 | 0 | 8 | 0 | 0 | | |
| Before-Tax Income (\$M) | 0.2 | 0.0 | 0.6 | 1.9 | 4.1 | 0.4 | 7.5 | 2.8 | 0.0 | 0.7 | 7.2 | 8.7 | 4.3 | 38.4 |
| % | 1 | 0 | 2 | 6 | 12 | 1 | 22 | 8 | 0 | 2 | 21 | 26 | | |
| After-Tax Income (\$M) | 0.2 | 0.0 | 0.5 | 1.7 | 3.4 | 0.4 | 6.6 | 2.6 | 0.0 | 0.6 | 6.6 | 7.1 | 3.8 | 33.5 |
| % | 1 | 0 | 2 | 6 | 11 | 1 | 22 | 9 | 0 | 2 | 22 | 24 | | |

DIVERSITY INDEX: 68

FOREST VULNERABILITY INDEX: -1

DIRECT TOURISM RATIO: 3.42

| | EMPLOYMENT IMPACT RATIOS | | | | | | | | | | | |
|--------------|--------------------------|----------------|-------------|------------|--------------|------|--------------|----------------|-------|-------------|--------------|--------------|
| | LOG- GING | PULP& PAPER | WOOD MFG | MIN ING | HIGH TECH | AGR | TOUR- ISM | PUBL SECTOR | CONST | MIN PROC | FILM PROD | FISH -ING |
| Indirect | 1.14 | N.A. | 1.28 | N.A. | 1.10 | 1.15 | 1.07 | 1.19 | 1.27 | N.A. | N.A. | 1.13 |
| No Migration | 1.15 | N.A. | 1.30 | N.A. | 1.16 | 1.19 | 1.14 | 1.25 | 1.33 | N.A. | N.A. | 1.22 |
| Migration | 1.25 | N.A. | 1.33 | N.A. | 1.28 | 1.24 | 1.25 | 1.37 | 1.45 | N.A. | N.A. | 1.36 |

AREA COMPONENTS

180 Comox-Strathcona K RDA

2003 BC Community Dependency Model
 based on 2001 Census information

BC Stats
 February 13, 2006

TABLE 1

AREA: Gabriola Island
CSD INDEX NUMBERS: 154

| | DEPENDENCIES | | | | | | | | | | | | | TOTAL |
|-------------------------|--------------|-----|-----|-------|-----|--------|------|-----|------|-----|------|------|------|-------|
| | FOR | MIN | F&T | AG&FD | TOU | HITECH | PUB | CON | FILM | OTH | TRAN | ONEI | NONB | |
| Employment | 71 | 0 | 9 | 64 | 256 | 39 | 449 | 132 | 0 | 258 | 0 | 0 | 523 | 1,800 |
| % | 6 | 0 | 1 | 5 | 20 | 3 | 35 | 10 | 0 | 20 | 0 | 0 | | |
| Before-Tax Income (\$M) | 1.2 | 0.0 | 0.0 | 1.4 | 4.1 | 1.0 | 11.3 | 3.3 | 0.0 | 8.1 | 13.2 | 19.8 | 10.2 | 73.8 |
| % | 2 | 0 | 0 | 2 | 6 | 2 | 18 | 5 | 0 | 13 | 21 | 31 | | |
| After-Tax Income (\$M) | 1.1 | 0.0 | 0.0 | 1.2 | 3.8 | 0.9 | 10.1 | 3.0 | 0.0 | 6.9 | 12.0 | 16.2 | 9.3 | 64.3 |
| % | 2 | 0 | 0 | 2 | 7 | 2 | 18 | 5 | 0 | 13 | 22 | 29 | | |

DIVERSITY INDEX: 67

FOREST VULNERABILITY INDEX: 1

DIRECT TOURISM RATIO: 3.36

| | EMPLOYMENT IMPACT RATIOS | | | | | | | | | | | |
|--------------|--------------------------|----------------|-------------|------------|--------------|------|--------------|----------------|-------|-------------|--------------|--------------|
| | LOG- GING | PULP& PAPER | WOOD MFG | MIN ING | HIGH TECH | AGR | TOUR- ISM | PUBL SECTOR | CONST | MIN PROC | FILM PROD | FISH -ING |
| Indirect | 1.22 | 1.74 | 1.22 | N.A. | 1.08 | 1.15 | 1.08 | 1.13 | 1.27 | N.A. | N.A. | 1.15 |
| No Migration | 1.34 | 1.80 | 1.24 | N.A. | 1.17 | 1.16 | 1.14 | 1.22 | 1.37 | N.A. | N.A. | 1.16 |
| Migration | 1.53 | 1.91 | 1.27 | N.A. | 1.31 | 1.18 | 1.23 | 1.38 | 1.54 | N.A. | N.A. | 1.18 |

AREA COMPONENTS

154 Nanaimo B RDA

2003 BC Community Dependency Model
based on 2001 Census information

BC Stats
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TABLE 1

AREA: Lasqueti Island
CSD INDEX NUMBERS: 200

| | DEPENDENCIES | | | | | | | | | | | | | TOTAL |
|-------------------------|--------------|-----|-----|-------|-----|--------|-----|-----|------|-----|------|------|------|-------|
| | FOR | MIN | F&T | AG&FD | TOU | HITECH | PUB | CON | FILM | OTH | TRAN | ONEI | NONB | |
| Employment | 10 | 0 | 20 | 15 | 10 | 3 | 22 | 46 | 0 | 26 | 0 | 0 | 23 | 175 |
| % | 7 | 0 | 13 | 10 | 6 | 2 | 15 | 30 | 0 | 17 | 0 | 0 | | |
| Before-Tax Income (\$M) | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.2 | 0.0 | 1.0 | 0.0 | 0.3 | 0.8 | 1.0 | 0.4 | 4.1 |
| % | 2 | 0 | 4 | 3 | 0 | 4 | 1 | 28 | 0 | 8 | 22 | 28 | | |
| After-Tax Income (\$M) | 0.1 | 0.0 | 0.2 | 0.1 | 0.0 | 0.1 | 0.0 | 0.9 | 0.0 | 0.3 | 0.7 | 0.8 | 0.4 | 3.6 |
| % | 3 | 0 | 5 | 3 | 0 | 4 | 1 | 28 | 0 | 8 | 22 | 26 | | |

DIVERSITY INDEX: 64

FOREST VULNERABILITY INDEX: 2

DIRECT TOURISM RATIO: 2.56

| | EMPLOYMENT IMPACT RATIOS | | | | | | | | | | | |
|--------------|--------------------------|----------------|-------------|------------|--------------|------|--------------|----------------|-------|-------------|--------------|--------------|
| | LOG- GING | PULP& PAPER | WOOD MFG | MIN ING | HIGH TECH | AGR | TOUR- ISM | PUBL SECTOR | CONST | MIN PROC | FILM PROD | FISH -ING |
| Indirect | 1.02 | N.A. | N.A. | N.A. | 1.00 | 1.10 | 1.05 | 1.06 | 1.19 | N.A. | N.A. | 1.06 |
| No Migration | 1.05 | N.A. | N.A. | N.A. | 1.15 | 1.12 | 1.05 | 1.06 | 1.25 | N.A. | N.A. | 1.08 |
| Migration | 1.20 | N.A. | N.A. | N.A. | 1.30 | 1.17 | 1.06 | 1.07 | 1.35 | N.A. | N.A. | 1.12 |

AREA COMPONENTS

200 Powell River E RDA

2003 BC Community Dependency Model
based on 2001 Census information

BC Stats
February 14, 2006

TABLE 1

AREA: Galiano, Mayne, North Pender, Saturna & South Pender Islands
 CSD INDEX NUMBERS: 123

| | DEPENDENCIES | | | | | | | | | | | | | TOTAL |
|-------------------------|--------------|-----|-----|-------|-----|--------|------|-----|------|-----|------|------|------|-------|
| | FOR | MIN | F&T | AG&FD | TOU | HITECH | PUB | CON | FILM | OTH | TRAN | ONEI | NONB | |
| Employment | 46 | 13 | 17 | 121 | 334 | 102 | 495 | 230 | 32 | 125 | 0 | 0 | 458 | 1,975 |
| % | 3 | 1 | 1 | 8 | 22 | 7 | 33 | 15 | 2 | 8 | 0 | 0 | | |
| Before-Tax Income (\$M) | 0.9 | 0.1 | 0.1 | 1.9 | 5.6 | 3.1 | 15.7 | 5.4 | 2.2 | 2.0 | 20.0 | 33.6 | 9.6 | 100.2 |
| % | 1 | 0 | 0 | 2 | 6 | 3 | 17 | 6 | 2 | 2 | 22 | 37 | | |
| After-Tax Income (\$M) | 0.8 | 0.1 | 0.0 | 1.8 | 5.2 | 2.6 | 13.4 | 4.8 | 1.7 | 1.8 | 18.2 | 27.4 | 8.7 | 86.6 |
| % | 1 | 0 | 0 | 2 | 7 | 3 | 17 | 6 | 2 | 2 | 23 | 35 | | |

DIVERSITY INDEX: 62

FOREST VULNERABILITY INDEX: 0

DIRECT TOURISM RATIO: 3.44

| | EMPLOYMENT IMPACT RATIOS | | | | | | | | | | | |
|--------------|--------------------------|----------------|-------------|------------|--------------|------|--------------|----------------|-------|-------------|--------------|--------------|
| | LOG- GING | PULP& PAPER | WOOD MFG | MIN ING | HIGH TECH | AGR | TOUR- ISM | PUBL SECTOR | CONST | MIN PROC | FILM PROD | FISH -ING |
| Indirect | 1.20 | N.A. | 1.23 | 1.32 | 1.03 | 1.15 | 1.07 | 1.13 | 1.27 | N.A. | 1.22 | 1.14 |
| No Migration | 1.21 | N.A. | 1.28 | 1.34 | 1.09 | 1.19 | 1.11 | 1.20 | 1.33 | N.A. | 1.45 | 1.14 |
| Migration | 1.23 | N.A. | 1.36 | 1.36 | 1.19 | 1.25 | 1.17 | 1.31 | 1.42 | N.A. | 1.60 | 1.15 |

AREA COMPONENTS

123 Capital G RDA

2003 BC Community Dependency Model
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