

Cowichan Region State of the Environment Report Update 2014

Farm Land and Food Security





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Introduction

Farming and other forms of food production are key components of the Cowichan Region’s well-being and resilience. Local food production creates jobs, reduces transportation-related greenhouse gas emissions,¹ provides insurance against disruptions in food supply, and fosters self-sufficiency—an important component of food security (see sidebar). Farmland also provides key ecological services such as habitat for wildlife, refuelling areas for winter bird migration and pervious surfaces for groundwater recharge, and contributes to the rural feel of the region.

Cowichan’s temperate climate and fertile soils allow for year-round growing and the area is well suited to many different agricultural activities—particularly at lower elevations along the east coast of the region. Much of the region’s cultivatable land needs irrigation to grow high-yield, high-value crops—a reality that puts pressure on an already overtaxed water supply. The rivers, lakes, ocean, and forests provide additional food sources including game, fish, shellfish, sea vegetables, mushrooms, salal, floral greenery, and medicines.

Changing and less predictable seasons and climatic conditions are having direct impacts on farmland and food production:

- Increased interruptions, delays and damage to crops, land and infrastructure due to extreme weather events;
- Increased delays and interruptions of imported food and agricultural input supplies due to critical distribution infrastructure damage from severe weather events;
- More frequent flooding of fields and inadequate drainage, particularly during the winter, and loss of nutrients due to flooding and soil erosion;
- Increased competition for limited water resources, particularly in the summer and fall;

¹ The fossil fuels and other resources needed to grow, package and transport food in large quantities contributes significantly to greenhouse gas emissions (3% in B.C. and Canada, 8% in the US, 14% worldwide).

UNDERSTANDING FOOD SECURITY

There are multiple definitions of the term “food security”. Three definitions are offered here, with the acknowledgement that some overlap exists. Clarifying this terminology may lead to greater understanding of the complexity of issues and richness of strategies surrounding food. This State of the Environment Report is focused more on the second and third definitions.

1. From a socio-economic/household perspective, food security means all people have affordable, convenient and reliable access to a variety of healthy, culturally appropriate foods, including local food, to meet dietary needs.* This definition does not presume that all food is locally sourced; imported food is often cheaper and the only option for lower income families.
2. From a climate change perspective, food security refers to the vulnerability of food systems to extreme events and is concerned with boosting the resilience of the food-producing sector and the region as a whole. Mitigation and adaption measures include reducing energy use associated with food growth and transportation, diversifying local food production, enhancing food storage and processing capabilities, and adopting an integrated approach to water management.
3. From a self-sufficiency perspective, food security (or more precisely food self-sufficiency) relates to a community’s capacity to produce local food and its citizens’ ability to access fresh and processed local food. Food self-sufficiency is a component of food security; replacing imported food with locally grown food is good for the economy and the environment. Strategies to maximize food production capacity and access include diversifying local food production, supporting local famers and small-scale producers and processors, and protecting traditional First Nations hunting and fishing territories.

* Based on the United Nations definition. Wording from Food Security Action Planning: A collaborative roadmap for achieving community food security in the Capital Regional District. May 2013.



- Wildfire damage to crops, land and infrastructure due to hotter summertime temperatures;
- Changes in types, prevalence and timing of pests, diseases, invasive species, and weeds;
- Increased pressure to convert agricultural land to other uses (e.g., if the land is continually flooded² or becomes unsustainable for growing);
- Potential for longer growing seasons and/or growing new crop types;
- Possibility of increased public support for local agricultural production in light of more frequent disruptions to food supply.³

Measuring Farm Land and Food Production

In measuring the state of farm land and food production in the region, it is useful to track the total amount of land capable of being farmed versus the area actually being farmed, the viability/sustainability of farming, and trends in the amounts and kinds of food being grown relative to regional self-sufficiency targets.

Given that climate change affects all aspects of water management for agricultural operations, it is also important to assess the capacity and reliability of the region's freshwater sources to meet the current and future needs of food producers.

Data are available from the [Agricultural Land Commission, Statistics Canada's Census of Agriculture](#) (2011), the [CVRD Water Demand Model](#) (2013) and [Cowichan Green Community's Food Security Report](#) (2014).

Indicators included in this report are:

- ² Flooding farm land can represent an opportunity for farmers to diversify their income sources. Some jurisdictions pay farmers to use some of their land to manage flooding (e.g. by holding run-off in the spring or during big rain events).
- ³ Enhancing Food Processing in the CVRD, Final Report, 2014. B.C. Climate Action Initiative in partnership with the Cowichan Valley Regional District. This list excludes impacts on fish and seafood.

- Farm land—available and in active use
- Farm operations—total, size and productivity
- Food self-sufficiency and crop/livestock diversity
- Agricultural water security

Farm Land – Total Available and Percentage in Production

Data Sources and Reliability

The [Cowichan Agricultural Area Plan](#) (2009) relied on Canadian and B.C. agricultural land ranking systems to determine how much of the region's land base is capable of agricultural production. These systems consider climate and soil characteristics, topography, drainage, and other landscape characteristics and are not based on the current use of the land. Although agriculture capability data are old (created during the 1960s, 70s and early 80s), the interpretations are still largely considered valid.⁴

The CVRD Water Demand Model (2013) inventoried land in the Agricultural Land Reserve and land zoned for agriculture by local government, and identified land in active use. The study used photo integration and visual observation to build a GIS database of crop, irrigation system type, soil texture and climate information, and also relied on cadaster information provided by the CVRD and verified through observation (the survey crew drove by each property and checked the database for accuracy using visual observation and aerial photographs from survey maps). This data source is reliable and repeatable.

The Agricultural Land Commission tracks the amount of land that is added to (inclusions) or removed from (exclusions) the Agricultural Land Reserve (ALR). This data does not monitor whether ALR land is actually being used for agricultural purposes. This data is reliable and repeatable.

⁴ Canadian Land Inventory, Agriculture and Agri-Food Canada. Accessed November 4, 2014. <http://sis.agr.gc.ca/cansis/nsdb/cli/index.html> Land Capability Classification System for Agriculture in British Columbia. Accessed November 4, 2014. <http://www.env.gov.bc.ca/wld/documents/techpub/moe1/moem1.pdf>



Statistics Canada’s Census of Agriculture records the amount of reported land being farmed (within and outside the ALR). The accuracy of data for total farms in operation and farm size could be compromised by non-reporting.

The actual number of farms operating in the region may be significantly higher than the census data. Also, urban farming and other forms of food production such as game, fish, shellfish, sea vegetables, and mushrooms—whether harvested for personal consumption or for licensed sale—are not captured by typical data collection systems.⁵

An indication of the scope of unreported farms can be found in a 2000 study of small scale farming in South Cowichan. This study found that 10% of farm land in the South Cowichan sub-region was being used to grow food (including non-quota poultry and egg production) strictly for the benefit of family and friends.⁶

Findings

Available Farm Land

Just under 9% (30,895 ha⁷) of the Cowichan Region’s land base (343,981 ha⁸) is arable land that can be cultivated, and more than 60% (19,053 ha) of this arable land is located in the Agricultural Land Reserve (see Figures 1 and 2).

5 Judy Stafford and Vanessa Goodall, Cowichan Green Communities, personal communication, 2014. Tracking numbers of licenses issued and harvest rates may provide some of this missing. For more information. See also, see 2009 CVRD Issues and Opportunities, Phase 1 Discussion Paper (<http://www.cvrld.bc.ca/DocumentCenter/Home/View/2225>).

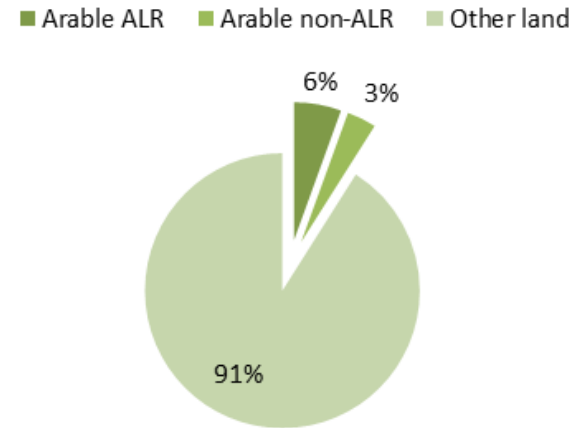
6 B.C. Ministry of Agriculture and Lands, Small Scale Farming in South Cowichan Valley, 2000.

7 The 2013 CVRD Water Demand Model report inventoried 30,895 ha of land zoned for agricultural use, including Agricultural Land Reserve (ALR) land. This figure is slightly lower than the figure of 32,830 ha referenced in the 2010 State of the Environment report, and produced by the CVRD in 2006 using GIS analysis.

8 This figure is from the 2013 CVRD Water Demand Model. It differs slightly from the total land area of or 347,455ha reported in the 2011 Census of Agriculture.

Figure 1: Arable land in the CVRD

Available arable land



Source: 2013 CVRD Water Demand Model

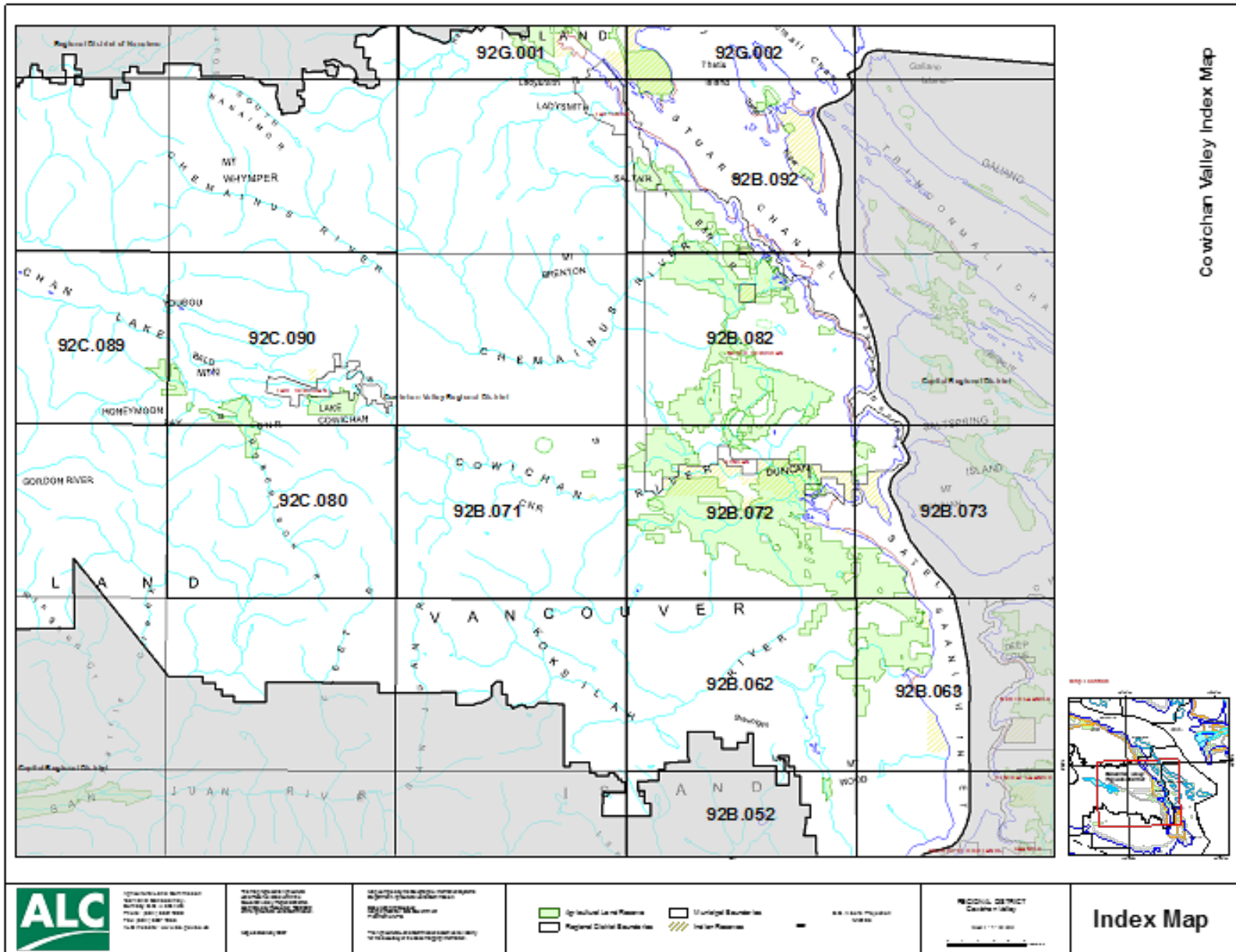
About half (16,012 ha) of the region’s cultivatable land is capable of producing crops such as vegetables, grains and fruit, and about 30% (9,421 ha) is considered prime agricultural land (suitable for a wide range of crops).⁹ About 80% of this area requires irrigation to produce high-value crops¹⁰, whereas only 2,120 ha are currently irrigated.¹¹

9 Cowichan Agriculture Area Plan State of the Industry Report, 2009.

10 Cowichan Agriculture Area Plan State of the Industry Report, 2009.

11 2011 Census of Agriculture Regional District profile.

Figure 2: Location of Agricultural Land Reserve parcels, 2014



Source: Agricultural Land Commission. Digital map http://www.alc.gov.bc.ca/mapping/alr_maps/Cowichan_Valley/Index_Map_Cowichan_Valley.pdf
 Accessed October 21, 2014

COWICHAN'S AGRICULTURAL LAND RESERVE

When the Agricultural Land Reserve was established in 1974, it protected close to 22,000 ha of agricultural land in the Cowichan Region. In 2012, this number was 19,053ha, for an overall loss of 2,947 ha. The overall trend for the past 35 years shows agricultural land being removed from the ALR and converted to other uses (residential development, industrial land, recreation facilities, and transportation infrastructures*). Since 2000 the amount of ALR land has increased slightly (by 79.8 ha) – often these inclusions are related to a subdivision development (land included as part of subdivision approval process).

Year	Inclusions	Exclusions	Net change
2000	0.0	0.0	0.0
2001	0.0	0.0	0.0
2002	14.0	35.0	-21.0
2003	0.0	18.2	-18.2
2004	2.4	36.8	-34.4
2005	80.9	3.0	77.9
2006	0.0	0.0	0.0
2007	54.3	30.0	24.3
2008	5	4	1
2009	0	11.3	-11.3
2010	50.6	0	50.6
2011	17.3	2.2	15.1
2012	3.1	5.3	-2.2
2013	3.3	5.3	-2
Total	230.9	151.1	79.8

Source: *Agricultural Land Commission, 2014*

* Applications and decisions for the past 10 years can be viewed on the Agricultural Land Commission website: <http://www.alc.gov.bc.ca/alc/content.page?id=EEDD9E63D0EE4A7FBFA06A797249C33C>. Accessed December 16, 2014.

Farm Land in Production

The reported amount of land being farmed has shrunk from a high of more than 18,600 ha in 1991 to 10,837 ha in 2011 (slightly down from 11,559 ha in 2006).¹² This total includes non-food items such as Christmas trees, maple tree taps, sod, vineyards, flowers, and other nursery products.

The 2014 report “Enhancing Food Processing in the CVRD”¹³ finds the biggest decline in farm land use has been in pastureland, which corresponds with significant declines in the population of meat and dairy animals (see Crop/Livestock section).

Total food and non-food farm land in production represents just over 3% of the region’s total land base¹⁴ and 35% of the region’s cultivatable land (10,837 ha out of a possible 30,895 ha).

The CVRD Water Demand Model (2013) identified 6,431 ha of active food-related agricultural land (Table 1). Total farm land in food-related production represents 21% of the region’s cultivatable land (6,431 ha out of a possible 30,895 ha) (Figure 3). At this time, it is unknown how much food production is occurring on ALR land,¹⁵ but about 24% of Vancouver Island’s ALR is being actively farmed (Figure 4) – 22% for forage, 1% for food crops and 1% for nursery crops.

12 Statistics Canada 2011 Census of Agriculture.

13 Enhancing Food Processing in the CVRD, Final Report, 2014. B.C. Climate Action Initiative in partnership with the Cowichan Valley Regional District.

14 The figure is 3.1% using the CVRD Water Model’s total landbase of 343,981 ha, or 3.3% using the 2011 Census of Agriculture’s total landbase of 347,455.

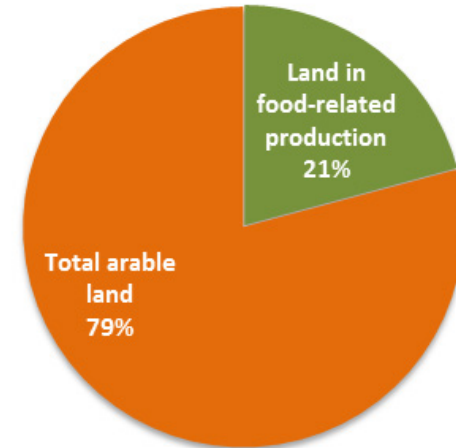
15 This information could be obtained through detailed analysis of the Ministry of Agriculture’s Cowichan Land Use Inventory raw data (used to develop the Water Demand Model). This analysis was outside the scope of this report update.

Table 1: Summary of Primary Agricultural Activities, 2013

Primary Agricultural Activity	Total Land Cover (ha)	Number of Parcels
Glass and poly greenhouse	2	13
Grains, cereals, oilseeds	34	9
Tree fruits	11	15
Grapes	108	32
Berries	39	14
Forage	6,092	1,631
Vegetables	25	29
Floriculture	1	4
Turf, Nut trees, Specialty	19	5
Nursery	76	37
Cultivated land, crop in transition	22	6
Total	6,431	1,795

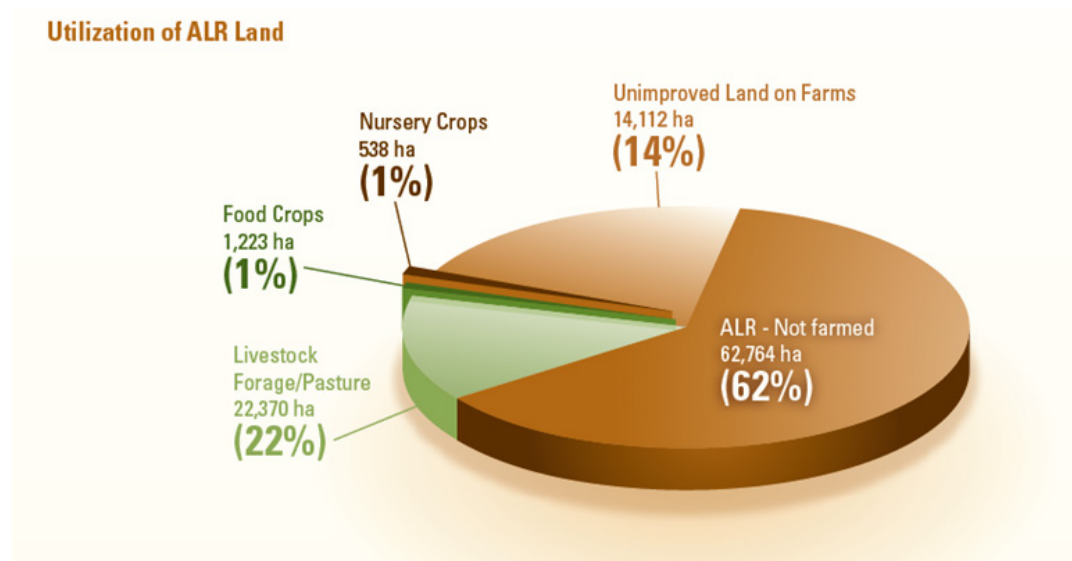
Source: CVRD Water Demand Model, 2013.

Figure 3: Food production as a percentage of total arable land



Source: 2013 CVRD Water Demand Model

Figure 4: Utilization of ALR land, Vancouver Island



Source: Vancouver Island Coast Regional Agriculture Framework for Action, 2012

Farm Operations – Total, Size and Productivity

Data Sources and Reliability

Statistics Canada’s Census of Agriculture records reported farms in operation and the total hectares being farmed. Productivity is measured in gross farm receipts (farm revenues) and expenses.

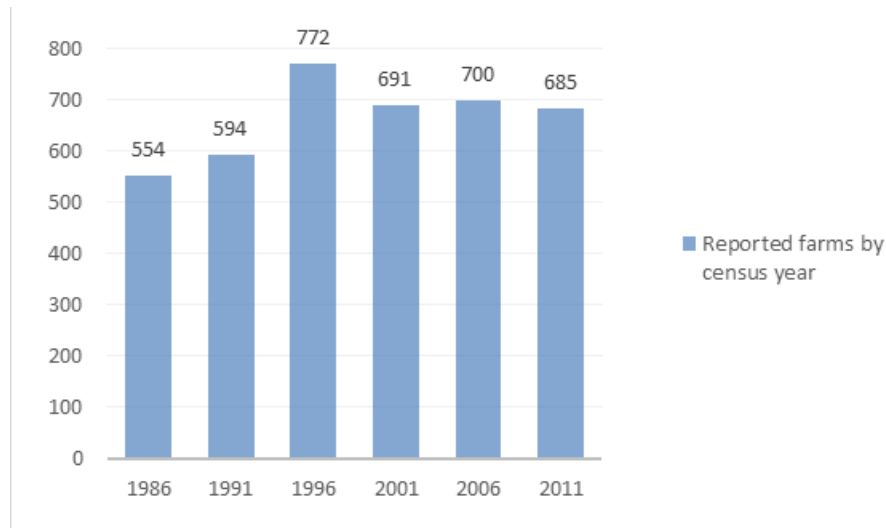
The accuracy of data for total farms in operation and farm size could be compromised by non-reporting. Also, direct sales at farm gates and at farmers’ markets are not tracked, resulting in the potential for an incomplete picture of total farm receipts.

Findings

Number of farms (reported)

The 2011 Census of Agriculture recorded 685 farms in the Cowichan Region (down from 700 in 2006). The number of reported farms has

Figure 5: Reported farms by census year, 1986 to 2011



Source: B.C. Ministry of Agriculture and Lands, *Cowichan Valley Regional District Agricultural Overview, 2008 and 2011 Census of Agriculture*.

remained fairly consistent since 2001, but has declined by more than 10% since the 1996 census (Figure 5).

As mentioned above, the actual number of farms operating in the region may be significantly higher than the census data.¹⁶

The District of North Cowichan is home to a large percentage of the region’s reported farms (55%), with most of the balance located in the South Cowichan area (28%)—including Cobble Hill, Cowichan Bay and Shawnigan Lake—and Saltair and on the Gulf Islands (12.5%).¹⁷ This breakdown largely mirrors the location of the region’s most fertile and arable land: on the east coast of the region, in the low elevation and floodplain areas.

Farm size

The average farm size in the region has been decreasing steadily for at least the past 25 years. The average farm size decreased by 50% between 1986 (31.2 ha) and 2006 (16.5 ha), and decreased by an additional 4% to 15.8 ha in 2011.¹⁸ Throughout this time, the vast majority of farms remained less than 28 ha (69 acres) in size (Table 2).

Farm revenues and expenses

Despite the overall decrease in farm size, total gross farm receipts have been slowly and steadily growing—by 50% in the past 15 years (1996 to 2011) and by 8% in the last 5 years (2006 to 2011).¹⁹ In other words, farms are becoming slightly smaller and slightly more productive, and opportunity exists to increase the intensity of current farming.²⁰

Cowichan farms are the most intensive in the Vancouver Island Coast Region (VICR). Average revenue per hectare ALR is \$2,684 in the Cowichan

16 Judy Stafford, Cowichan Green Community, personal communication, 2014.

17 Note: This breakdown based on 2006 Census of Agriculture and was sourced from the Cowichan Economic Development Commission, 2009. The 2011 Census only disaggregates data for North Cowichan (54.6% of total farms in region).

18 2011 Census of Agriculture, Regional District Profile.

19 2011 Census of Agriculture Regional District Profile

20 Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

Prepared for the Island Coast Economic Trust, the Ministry of Jobs, Tourism and Innovation, and the Ministry of Agriculture.

Table 2: Farm size, 2006 and 2011

	Cowichan Valley		Percentage of total 2011
	2006	2011	
Total number of farms	700	685	
Under 10 acres	262	267	39%
10 to 69 acres	330	318	46%
70 to 129 acres	50	50	7%
130 to 179 acres	20	17	2.5%
180 to 239 acres	16	10	1.5%
240 to 399 acres	16	18	3%
400 to 559 acres	5	5	1%
560 to 759 acres	1	0	0%

Source: 2011 Census of Agriculture, Regional District Profile

Region, more than double the average VICR farm revenue of \$1,106 per hectare ALR. By way of further comparison, the Capital Regional District averages \$3,180 per hectare ALR, the Central Okanagan \$3,307 per hectare ALR and the Fraser Valley \$12,550 per hectare ALR. Generally, the soils and climate on the VICR are similar to the Fraser Valley, indicating a clear potential to increase the value of food production.²¹

The 2010 State of the Environment Report suggested this increase in intensity could be partially attributable to more land under irrigation²² (irrigated land increased by 10% between 2001 and 2006). This could still be the case: while the 2011 Census of Agriculture reports a 16% decrease in irrigated area (from 2,465 ha in 2006 to 2,210 ha in 2011), the 2013 CVRD Water Demand Model records outdoor irrigated acreage at 2,503 ha minus 73 ha in golf courses.²³

²¹ Vancouver Island Coastal Regional Agricultural Framework, 2012

²² Each added hectare of irrigated land can displace 3+ hectares of non-irrigated land. The productivity of irrigated land is approximately three times greater than that of rainfall land. United Nations Food and Agriculture Organization. <http://www.fao.org/ag/magazine/0511sp2.htm> Accessed November 6 2013.

²³ 2,503 ha minus 73 ha in golf courses

Expenses are increasing more rapidly than revenues, resulting in a significant decline in farm profitability. In the last five years, gross margins have gone down by 22% (from an average of \$5,786 gross margin per farm in 2006 to \$4,646 in 2011).²⁴

Income for small-scale farmers is unsustainably low. Close to 63% of farms generate gross revenues under \$10,000 (Tables 3 and 4). This is an unsustainable level of income considering that in 2006 the average household (2.4 persons) in B.C. consumed \$8,000 in food each year.²⁵

More than 78.5% generate gross revenues of less than \$25,000.²⁶ Collectively these small farms generate 8% of total revenues for the region.²⁷ Meanwhile, 10% of farms (sales over \$100,000) generate 80% of the revenues.²⁸ Many of these high output farms are commodity producers who sell their product globally through formal marketing agencies and auctions.²⁹

This trend is evident across the Vancouver Island Coastal region.³⁰

²⁴ Enhancing Food Processing in the CVRD, 2014. B.C. Climate Action Initiative in partnership with the Cowichan Valley Regional District.

²⁵ Vancouver Island Coastal Regional Agricultural Framework, 2012 and personal communication with report co-author Gary Rolston, December 18, 2014.

²⁶ These low reported revenues may be offset direct sales to consumers and retailers. A 2000 study of 72 South Cowichan farms found that 75% of farmers were selling some of their product at the farm gate or directly to consumers, and 40% were relying entirely on farm gate sales. Small Scale Farming in South Cowichan Valley, 2000. B.C. Ministry of Agriculture and Lands.

²⁷ Cowichan Agriculture Area Plan State of the Industry report, 2009.

²⁸ Cowichan Agriculture Area Plan State of the Industry report, 2009. See also Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

²⁹ Cowichan Agriculture Area Plan State of the Industry report, 2009.

³⁰ Cowichan Agriculture Area Plan State of the Industry report, 2009. See also Vancouver Island Coast Regional Agriculture Framework for Action, 2012. Prepared for the Island Coast Economic Trust, the Ministry of Jobs, Tourism and Innovation, and the Ministry of Agriculture. This reality is in stark contrast to Agriculture and Agri-Food Canada's prediction that the average farming family total income will be \$132,579 in 2014. Source: <http://www.agr.gc.ca/eng/about-us/publications/economic-publications/alphabetical-listing/farm-income-forecast-for-2013-and-2014/?id=1392144307317>. Accessed December 18, 2014



- Ten per cent are well-established, full-time commodity farms, generating 80% of the revenue. Their margins are stable or declining, and many are expanding to achieve more profit through economies of scale. These farms generate more than \$100,000 per year.
- About 28% of the farms generate 12% of total revenue. Anecdotally, many of these are farms purchased by early retirees with capital, post-secondary education and management experience. These farms are growing in number and in their contribution to overall revenue. They are owner operated or family operated, have a clear business focus and generate between \$10,000 - \$100,000 per year.
- The majority of farms (62%) generate less than 8% of total revenue. In some cases, these provide important part-time income or tax benefits, but most are not motivated by income. They generate less than \$10,000 per farm per year.
- Low profitability is a major issue for farmers. Farmers, especially new farmers with little equity, struggle to find capital to expand, improve the land or get better access to markets. On average, farmers in the region keep about 6.2 cents from each dollar of sales. A small increase in prices or reduction in costs can have a significant impact on the bottom line.

Table 3: Farm revenues and expenses, 1996 to 2011

	1996	2001	2006	2011
Total farmland area (ha)	13,656	13,996	11,559	10,837
Number of farms	772	691	700	685
Total gross farm receipts	\$40,502,173	\$38,656,691	\$47,554,455	\$48,069,900
Gross farm receipts per hectare	\$2,965	\$2,761	\$4,114	\$4,435
Total farm business operating expenses *	n/a	\$35,434,487	\$43,503,736	\$44,886,708
Gross margin (total) \$		\$3,222,204	\$4,050,719	\$3,183,192
Gross margin (total) %	n/a	8.3%	8.5%	6.6%
Average gross margin (per farm) \$		\$4,663	\$5,786	\$4,646


Source: 2011 Census of Agriculture Regional District Profile

* Census of Agriculture data captures operating expenses for the calendar year prior to the census.

Table 4: Farms classified by total gross farm receipts, 2010

Gross farm receipt	# Farms
Under \$10,000	430
\$10,000-\$24,999	108
\$25,000-\$49,999	41
\$50,000-\$99,999	36
\$100,000-\$249,999	22
\$250,000-\$499,999	20
\$500,000-\$999,999	18
\$1,000,000-\$1,999,999	7
Over \$2,000,000	3

Source: 2011 Census of Agriculture



Food self-sufficiency target, actual food production and crop/livestock diversity

Data Sources and Reliability

The Cowichan Region is one of the major agricultural areas on Vancouver Island, and has the potential to produce much of the food its residents need. The soils and climate in the area will support a very wide range of products, and there is very significant potential to grow the agriculture industry by both expanding into land not currently used for agriculture, and better utilizing farmland already under cultivation (irrigated, drained, and farmed more intensively).³¹

The 2009 [Cowichan Area Agricultural Plan State of the Industry Report](#) proposes the following strategic direction in support of food security and food self-sufficiency: “...develop and/or maintain a resource base so that the agriculture industry can produce a basic diet for 45% of the local population.”

This 45% target was set in response to “widespread, if not unanimous, support to aim for significant increases in food self-sufficiency in the area.” The target is based on the number of hectares needed to produce a healthy diet for the population of the Cowichan Region, which in turn is based on B.C.’s [Food Self-Reliance report](#) (more on this below).

The 2009 plan contains a number of important notes related to the 45% target, including:

- Land uses that conserve or enhance the resources needed for food production in the future are important. (*Note: This statement can be interpreted as referring to “convertible resources” such as land presently used for golf courses, equestrian facilities and wineries that is cleared and possibly irrigated, and could be converted to food production if needed, and experienced operators who could shift into food production. Convertible resources represents a possible future*

*capacity/readiness to respond to changing food supply conditions.*³²⁾

- The target is not intended to “tell farmers what to produce”. Producers will adjust their product mix to fit market conditions. However, pursuing this self-sufficiency goal will ultimately ensure that the resources (land, labour, capital, irrigation and drainage, food storage and expertise/management) are in place to provide 45% of the required food when needed. The industry will convert land use to essential crops if there are food shortages in the future.”³³

The plan translates the 45% food self-sufficiency goal into targets for producing a wide variety of crops and livestock (Table 5).³⁴ These targets have been updated to reflect the region’s 2011 population, and are measured against data from Statistics Canada’s 2011 Census of Agriculture, and the 2013 CVRD Water Demand Model report.³⁵

The accuracy and reliability of census data could be compromised by non-reporting and by incomparable data. For example, census crop data is available as number of farms and total hectares, while information about livestock is reported as number of farms and number of heads of livestock, making it somewhat difficult to compare these types of production. In addition, some farms produce both crops and livestock, so it is not possible to extract distinct totals in these areas of production. The CVRD Water Demand Model (2013) ground-truthed study data and provides a more accurate picture of farm activity, but could also be hampered by farms producing multiple types of food.

32 Gary Rolston, personal communication, December 18, 2014 - co-author of the 2009 Cowichan Agricultural Area Plan and the 2012 Vancouver Island Coast Regional Agriculture Framework for Action

33 Cowichan Agricultural Area Plan’s Visions, Goals and Objectives, 2009. Words in italics added following personal communication with Gary Rolston, December 18, 2014.

34 Cowichan Agricultural Area Plan’s Visions, Goals and Objectives, 2009.

35 The accuracy and reliability of census data could be compromised by non-reporting. Also census crop data is available as number of farms and total hectares, while information about livestock is reported as number of farms and number of heads of livestock, making it somewhat difficult to compare these types of production. In addition, some farms produce both crops and livestock, so it is not possible to extract distinct totals in these areas of production. The CVRD Water Demand Model (2013) ground-truthed study data and provides a more accurate picture of farm activity, but could also be hampered by farms producing multiple types of food.

31 Vancouver Island Coast Regional Agriculture Framework for Action, 2012.



Another way to measure where the region’s current state relative to its food self-sufficiency target is to update the original assumptions behind the target using the latest population, Census of Agriculture, ALR and CVRD Water Demand Model figures. This data is reliable and repeatable.

Findings

Updating the original assumptions behind the 45% target

As mentioned above, the 45% food self-sufficiency target was based on assumptions contained in B.C.’s Food Self-Reliance report. This report suggests that 0.524 hectares (ha) are required to produce a healthy diet for one person (roughly the size of a football field) – made up of 10% irrigated land (0.053 ha), and 90% non-irrigated (0.471 ha).³⁶

Using 2011 population data, it is estimated that 42,093 ha (4,209 ha irrigated and 37,884 non-irrigated) would be required to feed the 100% of the population of the CVRD. It follows that feeding 45% of the population would require 18,941 ha (1,894 ha irrigated, and 17,047 ha non-irrigated).

The region meets this land base threshold: there are 30,895 ha of cultivatable land in the region, of which a significant 19,053 ha is in the ALR. In other words, Cowichan’s 45% food self-sufficiency target is achievable within the protected farmland of the ALR, making protection of this land base all the more important.

The region also meets the “land under irrigation” threshold. Of the 10,837 ha of farm land in use³⁷, 2,503 ha is under irrigation (including 73 ha of golf courses).³⁸

The region also seems to potentially meet some of the elements of “convertible resources” discussed above – namely cleared land, irrigation and food storage. Cleared agricultural land presently being used by golf courses, equestrian facilities, wineries and other non-food

36 Taking into account protein from fish and other seafood could reduce the per-hectare figure from 0.524 to 0.3. Gary Rolston, personal communication, December 18, 2014.

37 2011 Census of Agriculture

38 2013 Water Demand Model

related activities speaks to the region’s possible future capacity for food production.

Additionally, stored food is a sign of future capacity/readiness – including protein stored in animals (cows in the field, chickens in the barn).³⁹ Data is not currently available to substantiate the amount of cleared land being used for non-food activities (especially cleared ALR land) and storage capacity. Sourcing data for other elements of “convertible resources” (labour, capital, expertise/management) would enhance the region’s understanding of its progress towards achieving 45% self-sufficiency.

Actual food production

The Cowichan Region is currently achieving a level of food self-sufficiency between 10 to 19%,⁴⁰ far less than the goal of 45%. This is a significant decrease from 150 years ago when there was an abundance of food on Vancouver Island⁴¹ and 50 years ago when Vancouver Island produced 85%⁴² of its food needs.

To achieve the Agricultural Plan’s goal of 45% food self-sufficiency:

39 Gary Rolston, personal communication, December 18, 2014. See also sidebar on food storage on page 17.

40 Cowichan Green Community Food Security Report Card, 2014 suggests 18-19%, while the 2014 Enhancing Food Processing in the CVRD report suggests this figure should be closer to 10% when population growth is factored in. This report documents that between 2006 and 2011, the CVRD population increased by 4% while total farm receipts only increased by 1%. By comparison, the Vancouver Island Coastal region produces an average of 10.9% (Vancouver Island Coast Regional Agriculture Framework for Action, 2012).

41 Less than 150 years ago there was an abundance of food available for Vancouver Island inhabitants through fishing, hunting, gathering, and managed clam and root vegetable sites. From the late 1800s to mid-1900s agricultural development increased and Vancouver Island farms provided most of the food required by residents, including large volumes of vegetables, berries and dairy products from the Cowichan Region that fed a significant portion of the population. (Sources: Strategies for Increasing Food Security on Vancouver Island, 2011. Vancouver Island Community Research Alliance. And Cowichan Economic Development Commission, 2009.)

42 Climate Change and Food Security on Vancouver Island, 2011. Vancouver Island Community Research Alliance.



Table 5: Food Self Sufficiency Targets and Actuals (excluding seafood) – updated with 2011 population

	Production to achieve 100% food self-sufficient (Ha)	Target production (45%) (Ha)	Percentage of required*	1996 actual production (Ha)	2001 actual production (Ha)	2006 actual production (Ha)	2011 actual production (Ha) and % of target
Fodder							
Dairy	5,463	2,458	45%	4,820	5,621	4,795	4,960 (27%)
Meat (non-fish) & alternatives	31,650	14,876 (total is 17,334)	47%				
Grains (food)	2,330	n/a	n/a	n/a	n/a	n/a	n/a
Vegetables	1,422	853	60%	368	55	63	88 (10%)
Fruit, berries and nuts [including grapes]	1,221	732	60%	132	143	172 [75ha for grapes]	220 (30%) [98ha for grapes]
Total	42,093	18,941		5,320	5,954	5,159	5,349

Source: Cowichan Agricultural Area Plan’s Visions, Goals and Objectives, Cowichan Economic Development Commission, 2009.

Updated to reflect 2011 population data (80,332). Note that the 2nd and 3rd columns don’t quite add up due to small errors in original table. Note also that the 2011 Census of Agriculture total of 5,439 ha in food production differs from the 2013 Water Demand Model figure of 6,431 ha. This discrepancy is most likely due to differences in categorizing farming activities.

The first two columns in this chart are derived from the 2009 Cowichan Agriculture Area Plan Vision, Goals and Objectives document. See note below for explanation as to why some targets are more than 45%. The four ‘actual production’ columns are based on Census of Agriculture Data (2011 Regional District Profile) and group hay crops and field crops together because census data does not allow separation by dairy and meat.

* The 45% target established in 2009 was not based solely on the assumed area required. Adjustments were made for seasonality and competitive advantages/disadvantages. For example, the Cowichan Valley is well suited to production of vegetables, berries and a variety of fruits. Even with ideal storage and processing, these will not be available year round so the target for these crops was set at 60%. Other products (for example grains and red meat) can be produced at much lower costs, elsewhere in Western Canada. The target was adjusted on the assumption that the vast majority of the feed grain and most red meat will continue to be produced in areas better suited, off-island.

- The amount of farmland being used to produce food either needs to triple (from 6,431 ha to 18,941 ha) or needs to be irrigated more efficiently and farmed more intensively (see Agricultural Water Security section).⁴³

⁴³ The merits of using land that has already been cleared seem considerable: the vast majority of uncleared, not farmed ALR land on Vancouver Island is privately held forest (see Figure 4). This forested land is providing important natural services including carbon storage and soil erosion and flood prevention.

- The production of vegetables, fruit, berries and nuts (excluding wine grapes) needs to increase significantly. (Tables 5 and 1)
- Field crops could also benefit from a smaller boost in production.

Of the 685 reported farms in the region, approximately 62% are primarily involved in livestock operations, and approximately 38% are primarily involved in crop operations (Table 7).⁴⁴ Many farms produce a combination

⁴⁴ Cowichan Food Security Report Card. 2014.

Table 6: Farms classified by industry, 2006 and 2011

	2006	2011
Dairy cattle and milk production	40	33
Beef cattle ranching and farming, including feedlots	98	70
Hog and pig farming	6	3
Chicken egg production	43	36
Broiler and other meat-type chicken production	10	9
Turkey production	2	1
Poultry hatcheries	0	0
Combination poultry and egg production	8	12
All Other poultry production	3	1
Sheep farming	23	38
Goat farming	11	8
Apiculture	10	11
Horse and other equine production	103	80
Fur bearing animal and rabbit production	0	0
Animal combination farming	59	51
All other miscellaneous animal production	21	15
Soybean farming	0	0
Oilseed (except soybean) farming	0	1
Dry pea and bean farming	0	0
Wheat farming	1	1
Corn farming	1	0
Other grain farming	0	0
Potato farming	0	3
Other vegetable (except potato) and melon farming	29	34
Fruit and tree nut farming	71	74
Mushroom production	1	1
Other food crops grown under cover	8	11
Nursery and tree production	66	62
Floriculture production	13	13
Tobacco farming	0	0
Hay farming	51	78
Fruit and vegetable combination farming	12	15
Maple syrup and products production		2
All other miscellaneous crop farming		22

Source: 2011 Census of Agriculture

of crops and/or livestock; a study of small scale farming in South Cowichan found that two-thirds of all farms (66%) are mixed farm operations.⁴⁵

Crops

The vast majority of crop operations (95%) are comprised of field crops (e.g., hay, grasses, grains grown to feed dairy cattle and livestock). Although seemingly high, this level of production falls short of the self-sufficiency targets (Table 5). Challenges associated with increasing these crops are presented in the Livestock section below.

Note: discrepancies exist between vegetable and fruit, berries and nuts crop data from the Census of Agriculture (2011) and from the CVRD Water Demand Model (2013). Table 1 showcases these differences. These two data sources agree on the ratio of field crops to these other crops (93% and 95% respectively).

The production of fruits, berries and nuts has risen steadily over the past 15 years; however a large part of this growth can be attributed to grape growing for the wine industry. Grape production has grown from 1 ha in 1986 to 75 ha in 2006, and more recently to 98 ha (2011 Census) or 108 ha (2013 CVRD Water Demand Model). The production of other fruits, berries and nuts increased by 25% in the last five years.

Vegetable production met the self-sufficiency target in 1996 and then declined sharply, a drop that may coincide with three large commercial growers going out of business in the late 1990s.⁴⁶ In 2011, vegetables comprised a small percentage of total crops (up by 25% since 2006 to 11% in 2011 according to the Census, far less according to the 2013 CVRD Water Demand Model).

These increases in fruit, berry, nut and vegetable production are not as high as they could be, and are not necessarily helping the region get closer to food self-sufficiency. According to the 2014 report [Enhancing Food Processing in the CVRD](#), “The current system [of supply management quotas in the province] tends to work against regional and local production

⁴⁵ Small Scale Farming in South Cowichan Valley, 2000.

⁴⁶ Wayne Haddow, Regional Agrologist, Ministry of Agriculture. Personal communication, December 17, 2014.



such that the level of production of these commodities on Vancouver Island is much lower than production levels.”⁴⁷

The lack of processing and storage facilities has been identified as another impediment to meeting vegetable, fruit, berries and nut targets (see sidebar on page 17). The same 2014 report identifies potential growth areas for processed crop-related foods:

- Value-added berry processing: berry juices and individually quick frozen (IQF) packaged berries
- Value-added vegetable processing: IQF packaged vegetables (e.g., corn, peas), canned veggies, squash soup, borsht soup
- Dehydration and fermentation: cabbage sauerkraut, dehydrated stews for the marine market

The number of certified organic farms has risen in the past few years, from six farms in 2001 to 14 in 2014⁴⁸ (down from 16 farms in 2006). Most of these grow fruits, vegetables or greenhouse crops.⁴⁹ The number of uncertified organic farms is not known; the 2009 [CVRD Agricultural Plan, Issues and Opportunities Paper](#) indicates that “A large percentage of island farms report themselves as being ‘near organic’”.

Greenhouse production tripled between 1986 and 2006, from 14,874 m² to 47,101 m².⁵⁰ The 2011 Census of Agriculture did not report out on greenhouse vegetable production.

47 Census of Agriculture data, the 2014 Enhancing Food Processing in the CVRD report, and the other resources cited in this document do not capture how much of food remains within the local food market for regional consumption versus how much is sold outside the region. Statistics Canada’s Food Disappearance Data may prove helpful should future updates to this document include an exploration of production vs. consumption rates.

48 Cowichan Food Security Report Card, 2014.

49 Organic, sustainable agriculture offers a great deal of value, including a high job ratio, reduced greenhouse gas emissions (potentially by nearly 30%), reduced energy use (one-six of global energy use) and increased local resilience. Climate Change and Food Security on Vancouver Island, 2011. Vancouver Island Community Research Alliance.

50 Cowichan Valley Regional District Agricultural Overview, 2008. Ministry of Agriculture.

Livestock

Apart from sheep, lamb and rabbits, all animal production categories have seen a decline in recent years (Table 7).

Trends in livestock production decline in the Cowichan Region mimic those across Vancouver Island. The livestock industry (especially dairy, pork and poultry) has been declining since the mid-1990s due to the high cost of feed, fuel and fertilizer, and changes in subsidy programs. Remaining farmers are consolidating to take advantage of economies of scale, moving to niche market products such as grass-fed beef or specialty poultry, or converting to higher-value horticultural crops (forages) to cut costs and remain competitive.⁵¹ This decline is also attributed to significant losses in processing facilities⁵² and deficiencies in storage facilities (see sidebar), and the high cost of land⁵³.

A 2010 analysis of the situation in the Cowichan Region describes how the number of livestock produced for food is decreasing and at the same time an increasing percentage of those being produced is being shipped off island for processing not available on Vancouver Island.⁵⁴

51 Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

52 The 2014 report “Enhancing Food Processing in the CVRD” indicates that “over the past 10 years a number of food producers and distributors in the CVRD have ceased operations. A major chicken producer closed 10 years ago as well the Pacific Seafood Smoked Salmon plant, which closed 3 years ago. General Fruit and Produce was a major local produce distributor that sourced mainly from local suppliers and distributed across the Island, including major retailers such as Thrifty Foods, which has about 25 stores on the Island. The owners of the business eventually sold their property with no successor and closed down the business. Additionally, the livestock industry in the Cowichan Region is declining due to reduced access to abattoirs and inspected meat processing facilities, increased slaughterhouse waste costs, increased feed and fertilizers costs, and other market factors.”

53 “Livestock operations generally need more land and land costs are higher than for horticultural operations. Revenues per hectare are lower and costs – especially feed grain, fertilizer and fuel – are increasing. If there is no economic use for forage, some of these lands will not be maintained for agriculture, making them more difficult to put back into production at a later date.” Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

54 Strategies for Increasing Food Security on Vancouver Island, 2011. Vancouver Island Community Research Alliance.



The 2014 report “Enhancing Food Processing in the CVRD” identifies potential growth areas for processed livestock-related foods:

- Dairy Processing
 - o Cheese production
 - o Yogurt manufacturing—the CVRD has no yogurt production
 - o Fresh milk production for farm-gate sales
 - o Increased egg production—the CVRD is self-sufficient but Vancouver Island is in a deficit

- Meat Processing
 - o Expanded small scale chicken processing using a mobile abattoir
 - o Expanded meat processing
 - o Meat pies—strong demand from British, Australian, and New Zealand residents

The correlated declines in livestock production and pastureland represent a disturbing trend in terms of “readiness” (discussed above) because a large portion of the land base in the Cowichan Region is only capable of producing forages, and also because the livestock industry has contributed greatly to helping maintain the agricultural infrastructure of the area.⁵⁵

55 Cowichan Agriculture Area Plan State of the Industry Report, 2009.

Table 7: Trends in Livestock Production, 1996 -2011

Animals on Farms	1996		2001		2006		2011	
	Farms	Number	Farms	Number	Farms	Number	Farms	Number
Hens & Chickens	291	414,722	288	377,256	280	281,003	289	209,881
Turkeys	30	x	39	9,588	42	18,556	43	x
Total Other Poultry	108	1,814	82	1,924	69	5,756	80	2,994
Cattle & Calves	351	12,214	264	11,674	230	10,174	194	9,569
Dairy Cows	74	4,242	57	3,853	44	3,632	41	3,582
Beef Cows	210	1,705	162	1,468	138	1,146	112	946
Pigs	77	x	61	940	46	952	33	297
Sheep & Lambs	145	x	126	2,958	112	2,274	129	2,826
Horses & Ponies	186	718	148	704	183	876	155	714
Goats	52	938	47	832	46	1,021	51	712
Wild Boar	na	na	0	0	0	0	0	0
Mink	0	0	0	0	0	0	1	x
Fox	0	0	0	0	0	0	na	na
Bison	0	0	1	x	0	0	0	0
Deer	4	1,876	3	374	3	268	1	x
Llamas & Alpacas	7	71	22	314	36	697	35	431
Rabbits	43	x	9	296	13	61	17	155
Colonies of Bees for Honey	39	2,357	32	1,149	33	1,072	33	1,297

Credits

Source: Statistics Canada. Census of Agriculture, 1996, 2001, 2006, 2011, unless otherwise specified.
 Prepared by Ministry of Agriculture, Statistics and Research. January 2013



THE STATE OF FOOD PROCESSING AND STORAGE IN THE COWICHAN REGION

The CVRD is home to about 50 processors. One third are wineries. Of the remaining food processors, about 20% are meat producers, 25% are bakeries, 27% of specialty producers and the remainder are egg, dairy and beverage processors. Just under half of the processors are located in Duncan. Cobble Hill has the second largest concentration (about 25%).

About 350 people are employed in food manufacturing (excluding alcohol production) and that is rising by 2.5% per year. This means that the growth in processing jobs in the CVRD is outpacing population growth. Given that there are about 36 firms, the average number of employees per firm is about 10.

Significant gaps exist in the District's food processing infrastructure. Only three publicly available shared use commercial kitchens in the Valley focus on serving food processors.

The livestock industry in the Cowichan Region is declining due to reduced access to abattoirs and inspected meat-processing facilities, amongst other pressures. There are four abattoirs in the CVRD along with another three in the adjacent Regional Districts, which is just sufficient to meet local demands. No shared processing facilities with a proper packing line exist in the CVRD despite multiple efforts by various groups. Facilities exist in other parts of Vancouver Island that do custom food processing but they tend to be for larger quantities and for specialized products.

The CVRD has no major cold storage facilities within its boundaries. However, Cowichan Green Community offers cooler and freezer storage space to local farmers and secondary food producers, and there are companies that provide cold storage in the adjacent districts. These facilities have capacity to handle an increase in food storage demand from Cowichan Region Processors.

Source: Enhancing Food Processing in the CVRD, 2014

Agricultural water security

Data Sources and Reliability

Access to water is an issue in all agricultural plans in the Vancouver Island Coastal Region.⁵⁶

Water availability for food production is under pressure from increased demand from all sectors and fluctuations in supply due to climate change. Careful management of water supplies is essential to support the region's need and vision for expanded food production, protect water sources for other uses and reduce environmental impacts (e.g., ensure increased withdrawal of water for irrigation is not affecting adjacent ecosystems and ensure sufficient water flow in rivers to support fish spawning).

The Cowichan Region's historic abundance of fresh, uncontaminated, seemingly infinite water supplies have been replaced with a new reality of increasing pressures from development and urban population growth (particularly in the southern region where the majority of fertile agriculture is located), and contamination from a variety of sources including development projects, run-off from agricultural activities, industrial pollution, and other human activity.⁵⁷

Changing and less predictable seasons and climatic conditions are having direct impacts on agriculture and food security. The most significant of these will be reduced availability (summers characterized by limited water resources and periods of drought) and/or the physical degradation of land and water (winters marked by more frequent flooding of fields, inadequate drainage and nutrient loss).⁵⁸

An integrated and comprehensive approach to water management (from supply and storage, to irrigation, to drainage) at the farm level is seen a positive step in managing these challenges.⁵⁹

56 Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

57 Climate Change and Food Security on Vancouver Island, 2011.

58 Climate Change and Food Security on Vancouver Island, 2011.

59 From Cowichan Economic Development's Cowichan Adaptation Strategies webpage. Accessed November 8, 2014. <http://www.cvr.bc.ca/index.aspx?NID=1792>.



The 2013 CVRD Water Demand Model assesses current and future agricultural demands on water supply. The study examined crop, irrigation system type, soil texture, and climate data for all land zoned for agricultural use (including Agricultural Land Reserve land and First Nations land) in order to calculate water use and water demand. This data is reliable and repeatable.

The issue of water storage is being explored through the Regional Adaptation Strategies planning process (a Cowichan Economic Commission initiative). The recently completed Integrated Farm Water Planning Pilot (Phase One) created a toolkit that helps farmers evaluate water supply, storage capacity and future water use, and recommends strategies to achieve better water management. This toolkit relies on data from the CVRD Water Demand Model. Phase Two of the project is testing the toolkit with 8–10 farms that exhibit a variety of water issues. This phase is now underway with a completion date of April 2015.⁶⁰

Findings

The total amount of available water in the Cowichan Region is not known at this time. There are numerous variables to consider in calculating total water inputs (precipitation) and demands (all industries, commercial enterprises, households, and ecosystem).

The CVRD Water Demand Model provides important information about one source of demand: the agriculture industry. The model also provides valuable data about how improvements to irrigation infrastructure (e.g. converting to higher efficiency systems) can significantly reduce water use.

Irrigation is essential for the production of most high value crops (berries, grapes, vegetables) in the Cowichan Region. It is also very important for production of consistent, high-quality grass forage for livestock operations.⁶¹ Irrigation increases and stabilizes crop yields, increasing the income per hectare and reducing the risk for farmers. Improved drainage extends the growing season, increases yield and promotes deeper root

The findings of another Regional Adaptation Series report will be of interest to future State of the Environment updates. The “Extreme Weather Events Preparedness and Mitigation Pilot Project” will establish key areas of vulnerability across the region and farm types, and the conduct targeted group preparedness and mitigation planning in three to four agricultural areas.

systems that better access nutrients and water in the soil.⁶²

The high-level conclusions from the study are that:

- Availability of water varies throughout the Cowichan Region;
- Some areas are under a disproportionate amount of stress (due to hydrology, conflicts with other users, etc.); and
- Improvements to irrigation infrastructure (converting to higher efficiency systems) can significantly reduce water use.

These findings confirm assumptions in earlier reports, and support the strategic direction being pursued by all levels of government. Improvements to and expansion of irrigation infrastructure is seen as a key strategy to increasing food production and getting closer to food self-sufficiency targets.⁶³

On a practical level, these findings can help farmers understand how much water they are using, how they can use water more efficiently, and whether their farmland is located in a part of the region that has access to enough water or an area that is under stress.

Annual crop water demand

The Water Demand Model indicates that the predominant irrigated agriculture crops in the Cowichan are forage, including forage corn, grass, legume and pasture (significantly less are grapes and berry crops).

⁶⁰ Cowichan Adaptation Strategies, Cowichan Economic Development Commission. Accessed November 8, 2014 <http://www.cvrld.bc.ca/index.aspx?nid=1792>

⁶¹ Cowichan Agriculture Area Plan, State of the Industry Report, 2009.

⁶² Vancouver Island Coast Regional Agriculture Framework for Action, 2012.

⁶³ Vancouver Island Coast Regional Agriculture Framework for Action, 2012. And Cowichan Agriculture Area Plan State of the Industry Report, 2009. And B.C. Agriculture & Climate Change, Regional Adaptation Strategies: Cowichan, 2012. Climate Action Initiative, B.C. Agriculture and Food. And Enhancing Food Processing in the CVRD, 2014.



Water use was estimated using climate data from 1997 and 2003 to represent a relatively wet year and dry year respectively, based on 'average' irrigation management techniques. For context, 'good' techniques were identified as using drip systems instead of spray systems (travelling guns and sprinklers) for berry crops, vegetable crops and some of the other horticultural crops (not including forage), and irrigation scheduling techniques, especially on forage where drip conversion is not possible.

The model also calculates demand based on relatively good practices. As a result, actual use may actually be higher or lower than what is calculated by the model.

The outdoor irrigated acreage in Cowichan is 2,503 ha including 73 ha in golf courses. The total annual irrigation demand for this area was 18,531,206 m³ in 2003 (a dry year), and dropped to 7,528,548 m³ in 1997 (a wet year). This is slightly higher than the 2011 Census of Data figure of 2,210 ha, and more in keeping with the 2006 Census figure of 2,465 ha. Using census data, 19.5% of farm land in use is irrigated (2,210 ha of 10,837 ha).

The model predicts that water demand for 2003 would reduce from 18,531,206 m³ to 17,670,753 m³ if sprinkler systems were converted to drip and good management practices were implemented. Since forage is such a predominant crop in the region, the amount of reduction achieved is quite small.

Livestock water use

The water demand model provides an estimate of water use for livestock of 248,278 m³. This estimate is based on the number of animals in Cowichan as determined by the latest census, the drinking water required for each animal per day and the barn or milking parlour wash water.

Agriculture buildout crop water demand (using 2003 climate data – a dry year)

The model developed an agricultural buildout scenario to explore potential agricultural lands that could be irrigated in the future. The rules used to establish where potential additional agricultural lands were located in Cowichan Region are as follows:

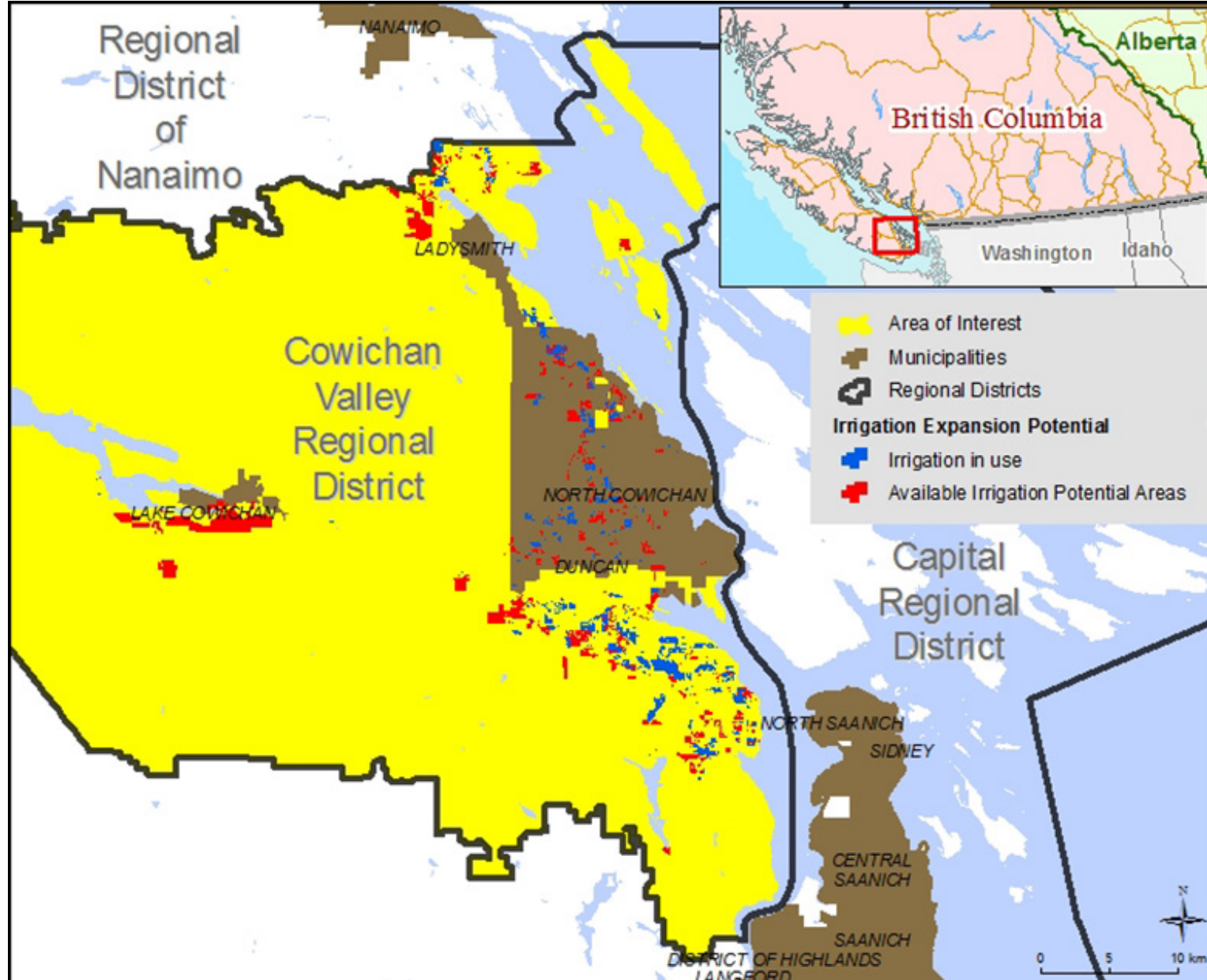
- within 1,000 m of water supply (lake)
- within 1,000 m of water supply (water course)
- within 1,000 m of water supply (wetland)
- within 1,000 m of high productivity aquifer
- within 1,000 m of water purveyor
- with Agriculture Capability class 1–4 only where available
- must be within the ALR
- below 250 m average elevation

For the areas that were determined eligible for future buildout, a crop and irrigation system formula was applied. Where a crop already existed in the land use inventory that crop would remain and an irrigation system assigned. If no crop existed, then a crop and irrigation system was assigned using the following criteria:

- Forage crops: 50% of buildout area with sprinkler irrigation
- Pasture: 10% of buildout area with sprinkler irrigation
- Grapes: 20% of buildout area with drip irrigation
- Vegetables: 20% of buildout area with drip irrigation

Figure 6 indicates the location of agricultural land that is currently irrigated (dark green) and the land that can be potentially irrigated (red). Based on the scenario provided for Cowichan, the additional agricultural land that could be irrigated is 4,417 ha. The water demand for a dry year like 2003 would be 43,654,055 m³ assuming efficient irrigation systems and good management.

Figure 6: Cowichan Irrigation Expansion Potential



Source: CVRD Water Demand Model, 2013



When climate change is added to the buildout scenario the water demand could increase to 53,748,201 m³ in 2053.

Data Gaps

The total amount of available water in the Cowichan Region is not known at this time. There are numerous variables to consider in calculating total water inputs (precipitation) and demands (all industries, commercial enterprises, households, and ecosystem). The CVRD Water Demand Model only provides information about the agriculture industry.

Run-off from agricultural operations is contributing to water pollution, but there is no data on the extent of agricultural pollution or the steps being taken to reduce it.

Other forms of food production are not tracked, including food grown on farms not captured by the census and urban farms, and food harvested from the rivers, lakes, ocean and forests.

Statistics Canada's Food Disappearance Data may prove helpful should future updates to this document include an exploration of production vs. consumption rates (how much of food remains within the local food market for regional consumption versus how much is sold outside the region).



