Growing Knowledge

BRITISH COLUMBIA | Ministry of Agriculture

Land Use Inventory Report

Reference Number: 800.510-49.2013

Richmond

- Summer 2010 -

Photo Credit: In t he Field Blog. The People & Programs of the NC Department of Agriculture & Consumer Services. http://info.ncagr.com

Strengthening Farming Program
Sustainable Agriculture Management Branch
Ministry of Agriculture

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Acronyms

AAC	Agricultural Advisory Committee
AAP	Agricultural Area Plan
AGRI	BC Ministry of Agriculture
ALC	Agricultural Land Commission
ALR	Agricultural Land Reserve
ALUI	Agricultural Land Use Inventory
GIS	Geographic Information Systems

Definitions

General

Agricultural Land Reserve (ALR) – A provincial zone in which agriculture is recognized as the priority use. Farming is encouraged and non-agricultural uses are controlled.

BC Assessment – The Crown corporation which produces annual, uniform property assessments that are used to calculate local and provincial taxation. The database purchased from BC Assessment contains information about property ownership, land use, and farm classification, which is useful for land use surveys.

Cadastre – The GIS layer containing parcel boundaries, i.e. legal lot lines.

Crown ownership – Crown ownership includes parcels which are owned by municipal, provincial or federal governments. Parcel ownership is determined by the Integrated Cadastre Fabric maintained by the Parcel Fabric Section of the BC Government.

Farm classification for tax assessment – Applies to parcels producing the minimum dollar amount to be classified as a farm by BC Assessment. Local governments apply a tax rate to farmland which is usually lower than for other land. To receive and maintain the farm classification, the land must generate annual income from agricultural production.

Farm Unit – An area of land used for a farm operation consisting of one or more contiguous or non-contiguous parcels, that may be owned, rented or leased, which form and are managed as a single farm.

Land Cover

Anthropogenic – The term *anthropogenic* describes an effect or object resulting from human activity. In this report, the term anthropogenic refers to land cover originating and maintained by human actions but excludes farmed land cover; cultivated field crops, farm infrastructure, and crop cover structures.

Anthropogenic – **Built up - Other** – Lands covered by various unused or unmaintained built objects (structures) and associated yards that are not directly used for farming.

Anthropogenic – **Managed vegetation** – Lands seeded or planted for landscaping, dust or soil control but not cultivated for harvest or pasture. Includes parklands, golf courses, landscaping, lawns, vegetated enclosures, remediation areas.

Anthropogenic – **Non Built or Bare** – Human created bare areas such as extraction or disposal sites. Includes piles, pits, fill dumps, dirt parking or storage areas.

Anthropogenic – **Residential** – Lands covered by built objects (structures) and their associated auxiliary buildings, yards, roads, and parking. Includes single and multifamily dwellings, and mobile homes.

Anthropogenic – **Residential footprint** – Includes the main residence plus its associated yard, driveway, parking and any auxiliary buildings or structures. When two residences are on a property, areas associated to both (such as shared driveways, parking or yard), are assigned to the closest residence.

Anthropogenic – **Settlement** – Lands covered by built objects (structures) and their associated yards, roads, parking. Includes institutional, commercial, industrial, sports / recreation, military, non linear utility areas and storage / parking.

Anthropogenic – **Transportation** – Lands covered by built objects (structures). Includes roads, railways, and airports and associated buffers and yards.

Anthropogenic – **Utilities** – Lands covered by built objects (structures). Includes linear features such as pipelines or transmission lines.

Anthropogenic Waterbodies – Areas covered by water, snow or ice due to human construction. Includes reservoirs, canals, ditches, and artificial lakes - with or without non cultivated vegetation.

Crop cover structures – Land covered with built objects including permanent enclosed glass or poly structures (**greenhouses**) with or without climate control facilities for growing plants and vegetation under controlled environments, and barns used for growing crops such as mushrooms. Excludes non permanent structures such as hoop or tunnel covers.

Cultivated field crops - Land under cultivation for harvest or pasture. Includes crop land, fallow farmland, unused forage or pasture, un-housed container crops and crops under temporary covers. Excludes natural pasture, rangeland, greenhouses, mushroom barns and other crop houses.

Farm infrastructure – Land covered by farm related built objects (structures) and their associated yards, roads, parking. Includes barns, storage structures, paddocks, corrals, riding rings, farm equipment storage, and specialized farm buildings such as hatcheries. Excludes greenhouses, mushroom barns and other crop houses.

Natural and Semi-natural – Land cover which has not originated from human activities or is not being maintained by human actions. Includes regenerating lands, and old farm fields.

Natural and Semi-natural – Grassland – Land cover dominated by herbaceous plants with long, narrow leaves characterized by linear venation; including grasses, sedges, rushes, and other related species.

Natural and Semi-natural – Herbaceous – Land cover dominated by low, non woody plants such as ferns, grasses, horsetails, closers and dwarf woody plants. If greater than 50% cover is grass, the land is categorized as grassland.

Natural and Semi-natural – **Natural bare areas** – Includes bare rock areas, sands and deserts.

Natural and Semi-natural – **Natural pasture** – Smaller fenced areas usually on private land with uncultivated (not sown) natural or semi-natural grasses, herbs or shrubs used for grazing domestic livestock.

Natural and Semi-natural – **Rangeland** – Larger fenced areas usually on Crown land with uncultivated (not sown) natural or semi-natural grasses, herbs or shrubs used for grazing domestic livestock.

Natural and Semi-natural – Shrubland – Land where less than 10% crown cover is native trees and at least 20% crown cover is multi-stemmed woody perennial plants, both evergreen and deciduous.

Natural and Semi-natural – Treed - closed – Land where between 60 and 100% of crown cover is native trees.

Natural and Semi-natural – Treed - open – Land where between 10 and 60% of crown cover is native trees.

Natural pasture or rangeland – Land with uncultivated (not sown) natural or semi-natural grasses, herbs or shrubs used for grazing domestic livestock. This land cover is considered "Used for grazing" and "Not used for farming" although usually these areas are extensions of more intensive farming areas.

Unmaintained field crops – Land under cultivation for field crops which has not been maintained for several years and probably would not warrant harvest.

Unmaintained forage or pasture – Land under cultivation for forage or pasture which has not been cut or grazed during the current growing season and has not been maintained for several years.

Unused forage or pasture – Land under cultivation for forage or pasture which has not been cut or grazed during the current growing season.

Livestock

Animal Unit Equivalent – A standard measurement used to compare different livestock types. One animal unit equivalent is approximately equal to one adult cow or horse.

Scale of livestock operations – The scale system used in this report to describe livestock operations includes 4 levels:

- "**Very Small** Approximately 1 cow or horse or bison, 3 hogs, 5 goats or deer, 10 sheep, 50 turkeys, 100 chickens (1 animal unit equivalent)
- "**Small**" LESS THAN 25 cows or horses or bison, 75 hogs, 125 goats or deer, 250 sheep, 1250 turkeys, 2500 chickens (2 - 25 animal unit equivalents)
- "**Medium**" LESS THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1000 sheep, 5,000 turkeys, 10,000 chickens (25 - 100 animal unit equivalents)
- "**Large**" MORE THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1000 sheep, 5,000 turkeys, 10,000 chickens (over 100 animal unit equivalents)

Land Cover and Farming

Actively farmed – Land cover considered **Farmed** but excludes unused / unmaintained field crops, and unmaintained greenhouses. Does not include natural pasture or rangeland.

Farmed – Land cover directly contributing to agricultural production (both actively farmed and inactively farmed). Includes land in **Cultivated field crops, Farm infrastructure** and **Crop cover structures** (see individual definitions). Does not include natural pasture or rangeland.

Inactively farmed. Land cover considered "Farmed" but is currently inactive. Includes unused / unmaintained forage and pasture, unmaintained field crops, and unmaintained greenhouses or crop barns. Does not include natural pasture or rangeland.

Potential for farming – Land without significant topographical, physical or operational constraints to farming such as steep terrain, land under water, or built structures. For example, land with little slope, sufficient soils and exhibiting a natural treed land cover would be considered as having potential for farming.

Land Use

No apparent use – Parcel with no apparent human use; natural areas, long term fallow land, cleared land not in production, abandoned or neglected land, abandoned or unused structures.

Resource protection & research – Government or private research activities (including agriculture). Flood protection areas.

Water management – Areas used to actively or inactively manage water; reservoirs, dikes, ditches, managed wetland.

Land Use and Farming

Used for farming – Parcels where the majority of the parcel area is farmed OR parcels which exhibit significant intensity of farming are considered "Used for farming". Specifically, parcels that meet at least one of the following criteria:

- medium or large scale livestock, apiculture or aquaculture operations
- at least 50% parcel area in cultivated field crops (excluding unused forage or pasture)
- at least 50% parcel area built up with farm infrastructure
- at least 25% parcel area built up with crop cover structures (excluding unmaintained structures)
- at least 40% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and small scale livestock, apiculture or aquaculture operations
- at least 33% parcel area in cultivated field crops (excluding unused forage or pasture) and at least 55% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure
- at least 10% parcel area in crop cover structures (excluding unmaintained structures) and at least 40% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure
- at least 20% parcel area and at least 20 ha in cultivated field crops (excluding unused forage or pasture)
- at least 25% parcel area and at least 10 ha in cultivated field crops (excluding unused forage or pasture)
- at least 30% parcel area and at least 5 ha in cultivated field crops (excluding unused forage or pasture)
- at least 10% parcel area and at least 2 ha built up with crop cover structures (excluding unmaintained structures)
- at least 20% parcel area and at least 1 ha built up with crop cover structures (excluding unmaintained structures)

Not used for farming – Parcels that do not meet the "Used for farming" criteria presented above.

Used for grazing – Parcels "Not used for farming" with a significant portion of their area in natural pasture or rangeland and evidence of active grazing domestic livestock.

Unavailable for farming – "Not used for farming" parcels where future agricultural development is improbable because of a conflicting land use that utilizes the majority of the parcel area. For example, most residential parcels are considered not available for farming if the parcel size is less than 0.4 hectares (approximately 1 acre) since most of the parcel is covered by built structures, pavement and landscaping.

Available for farming – Parcels that can be used for agricultural purposes without displacing a current use. Includes all parcels that do not meet the "Unavailable for farming" criteria.

Not used for farming but available – Parcels that do not meet the "Used for farming" criteria but can be used for agricultural purposes without displacing a current use.

Executive Summary

In the summer of 2010, the BC Ministry of Agriculture (AGRI) conducted an Agricultural Land Use Inventory (ALUI) for the City of Richmond. The ALUI was funded in part by Metro Vancouver, and was completed with in-kind support from the City of Richmond and local farmers.

ALUIs can be used to understand which agricultural activities are occurring in the surveyed area. Analysis of the data can be used to determine the capacity for agricultural expansion, and the amount of land within the Agricultural Land Reserve (ALR) that is not available for agriculture. The data can also be used to develop an agricultural water demand model for the surveyed area.

The ALUI for Richmond was conducted using a drive-by inventory that recorded land cover and land use on a per-parcel basis, as a "snapshot in time." Four categories of parcels were included: i) all parcels in the ALR; ii) parcels zoned for Agriculture outside of the ALR; iii) parcels outside of the ALR that were assessed as a farm by BC Assessment; and iv) parcels zoned as Rural in the Metro Vancouver Regional Growth Strategy (which have agriculture as a permitted use).

The ALR in Richmond consists of 5,176 ha. 92% of the ALR was surveyed, consisting of a total of 4,756 ha and 2,093 parcels, with the remaining 420 ha being in foreshore, road rights of ways or less than 100 square metres in size. An additional 78 ha was surveyed outside of the ALR.

The data on each parcel was collected in two ways: land cover (the biophysical material at the surface of the earth) and land use (how people utilize the land). A parcel could have numerous land covers, but was assigned up to two land uses. These two methods of data collection allowed different forms of analysis.

In terms of land cover in the ALR, a total area of 2,797 (54%) was farmed (both actively and inactively), 1,032 ha was anthropogenically modified (20%), and 927 ha was in a natural or semi-natural state (18%). As mentioned above, 420 ha (8%) was not surveyed, and was not available for farming. Farmed land cover types included cultivated field crops, farm buildings and structures, and greenhouses. It is important to note that some of the anthropogenically modified land covers may support farming, e.g. farm residences, vegetative buffers, and farm roads, but were not defined as 'farmed' land covers for the purpose of this part of the analysis. Interestingly, an additional 16 ha outside of the ALR were farmed. (Please see Table 1 and Map B1 for details).

In terms of land use, the entire parcel was examined, and a "Used for farming" definition was applied, based on the percentage and/or scale of the parcel in cultivated crops, farm infrastructure, and/or certain scales of livestock production. (For a more detailed definition of "Used for farming" please see the Definitions section.) In terms of land use in the ALR, 3,006 ha (58%) was defined as "Used for farming," and 1,750 ha (34%) was defined as "Not used for farming". In this analysis, farm residential uses and farm roads, were included in the "Used for farming" subtotal (along with other mixed uses such as transportation and communication and utilities). As before, 420 ha (8%) was not surveyed, and was not considered to be available for farming. (Please see Table 2 and Maps B3 and B4 for details).

A third way to analyze the data is to analyze how much land is available for farming, how much of that has the potential to be farmed, and what are the characteristics of these two types of land. This involves looking at both land covers and land use. Land may be unavailable for farming because of existing land use (e.g. parks, golf courses), or may have limited potential for farming because of physical limitations (e.g. steep slopes).

Of the 5,176 ha in Richmond's ALR, 420 ha (8%) was not surveyed, but would not be available to be farmed or have the potential to be farmed (e.g. it was in road rights of way, etc.). A further 978 ha (19%) was considered to be unavailable for farming due to existing land use or land cover (e.g. it was in parks, golf courses, institutional uses, non-farm residential uses, etc.). Added to that was the 71 ha (1%) of the ALR that is used in farm support (e.g. farmhouse residential footprint, artificial water bodies such as farm reservoirs, and transportation such as farm roads). A further 38 ha (<1%) was defined as having limited potential for farming due to site limitations (e.g. drainage limitations, etc.). That left 2,761 ha (53%) of the ALR that was actively farmed, and 908 ha (18%) of the ALR that was available for farming. Of that 18%, 143 ha occurred on parcels that are already "Used for farming" and 765 ha occurred on parcels not "Used for farming." (Please see Table 4, Figure 6 and Maps B5 and B6 for details).

On parcels "Used for farming" the largest gains for bringing more land into active agricultural production would come from converting the land cover with "Anthropogenic managed vegetation" (e.g. lawns, gardens) (65 ha), and clearing "Natural and Semi-natural vegetation" (48 ha). (Please see Figure 7 for details).

On parcels "Not used for farming" the largest gains for bringing more land into active agricultural production would come from clearing land with natural and semi-natural vegetation (501 ha), and bringing the 176 ha of "Anthropogenic managed vegetation" into production. (Please see Figure 8 for more details).

In terms of farming activities, two of the land covers were examined in detail: cultivated field crops and greenhouses. The top three crops were berries at 1,431 ha (or 28% of the ALR), followed by vegetables at 557 ha (11%) and forage and pasture at 481 ha (9%). Within the berry category, cranberries, blueberries and strawberries were the top three crops in terms of area. Within the field vegetable category, mixed vegetables, potatoes, and sweet corn were the top three crops in terms of area. Greenhouses (vegetable, nursery and floriculture) covered less than 1% of the ALR. (Please see Table 8, Table 13 and Maps B7 to B11 for more information).

Irrigation use was captured by crop type and irrigation system type, to aid in developing a water demand model for agriculture in Metro Vancouver. Sprinkler systems were the most commonly used (1,341 ha), and were used on a broad range of crops. Trickle systems were the next most common (89 ha) and were exclusively used on berry, vegetable, nursery and vine crops. Subsurface systems were third (used on 66 ha and on several types of crops). (Please see Table 14 and Map B12 for more information).

Livestock activities were also recorded, but are very difficult to measure using a windshield survey method. Livestock may be in barns, may be mobile, and may utilize more than one land parcel. The inventory data does not identify animal movement between parcels that make up a farm unit, but reports livestock at the parcel where the animals or related structures are observed. The Richmond inventory results showed that equines were the most common type of livestock activity (with 32 out of 60 activities), followed by poultry (12 out of 60 activities). There were 4 intensive poultry activities in Richmond and 8 non-intensive activities (e.g. backyard flocks). No actual livestock numbers were obtainable through the survey, so the results were reported as a range in terms of animal unit equivalents for each parcel. (Please see the Definitions section for more information, as well as Table 16 and Maps B13 to B15).

On-farm value added activities were only observed on 6% of all parcels "used for farming." These included: 46 parcels with seasonal stands; 10 parcels with U-pick activities; 7 parcels with permanent retail stores/stands; 2 parcels with wine/cider processing; 2 parcels with seasonal events; and 1 parcel with tours. In some cases more than one of these uses occurred on the same parcel. (Please see Figures 33 and 34 for more information).

In terms of condition of ALR lands, further analysis was conducted on 2,079 parcels with 4,747 ha or 92% of Richmond's ALR land. This additional analysis found that while 68% of the parcels are less than 1 ha in size, they make up only 10% of the total area. Most of Richmond's ALR is in larger parcels. The majority of the parcels "Not used for farming" are less than 2 ha in size. (Please see Figures 36 to 39 for more information).

Residential uses occurred on 1,068 parcels, and 719 of those parcels were "Not used for farming." Houses greater than 5,000 sq. ft. in size were found on 86 parcels, and 59 of those parcels were "Not used for farming." (Please see Tables 18 and 19 for more information).

Agrologist Comments[1]

Richmond has a rich agricultural heritage, and is a significant contributor to agricultural production in the Lower Mainland[2].

Richmond was incorporated in 1879, and all of the first councillors plus the first warden (now known as mayor) were farmers. Richmond initially supplied food and produce to the developing cities of New Westminster and Vancouver. Cranberries are native to Richmond's bogs, and were used as a food source by the First Nations people of Lulu Island. They started to be commercially produced in Richmond in the 1920s.

Richmond has a mix of large scale and small scale parcels in its ALR, and a number of its farmers lease land from other farmers or local landowners to facilitate crop rotation. Richmond is a leader in the cranberry sector, and produces about 33% of the province's cranberries. A new $26 million state-of-the-art cranberry receiving station facility was opened by Ocean Spray in Richmond in 2012.

Soils in Richmond are composed of fertile deltaic deposits. They have good water storage capacity, but typically require drainage. Richmond's mild winters and summers, coupled with level topography, mean the area is well suited to farming.

Richmond's irrigation water intake sources are at the mouth of Fraser River. The existing surface water ditch infrastructure provides both drainage and irrigation. Currently the ditch infrastructure does not supply adequate irrigation water to all parts of Richmond's Agricultural Land Reserve (ALR). In 2006 the City undertook an East Richmond Agricultural Water Supply Study to determine improvements to the East Richmond ditch and pumping infrastructure. The recommendations from that study are being implemented in phases.

As a rapidly developing urban area, Richmond is home to the Vancouver International Airport, as well as Port Metro Vancouver facilities. Urban-rural conflict which results in trespass, theft and vandalism of farm property is an ongoing issue. Farmers find it increasingly difficult to move farm vehicles and equipment between farm parcels, as formerly rural roads have now become busy commuter routes.

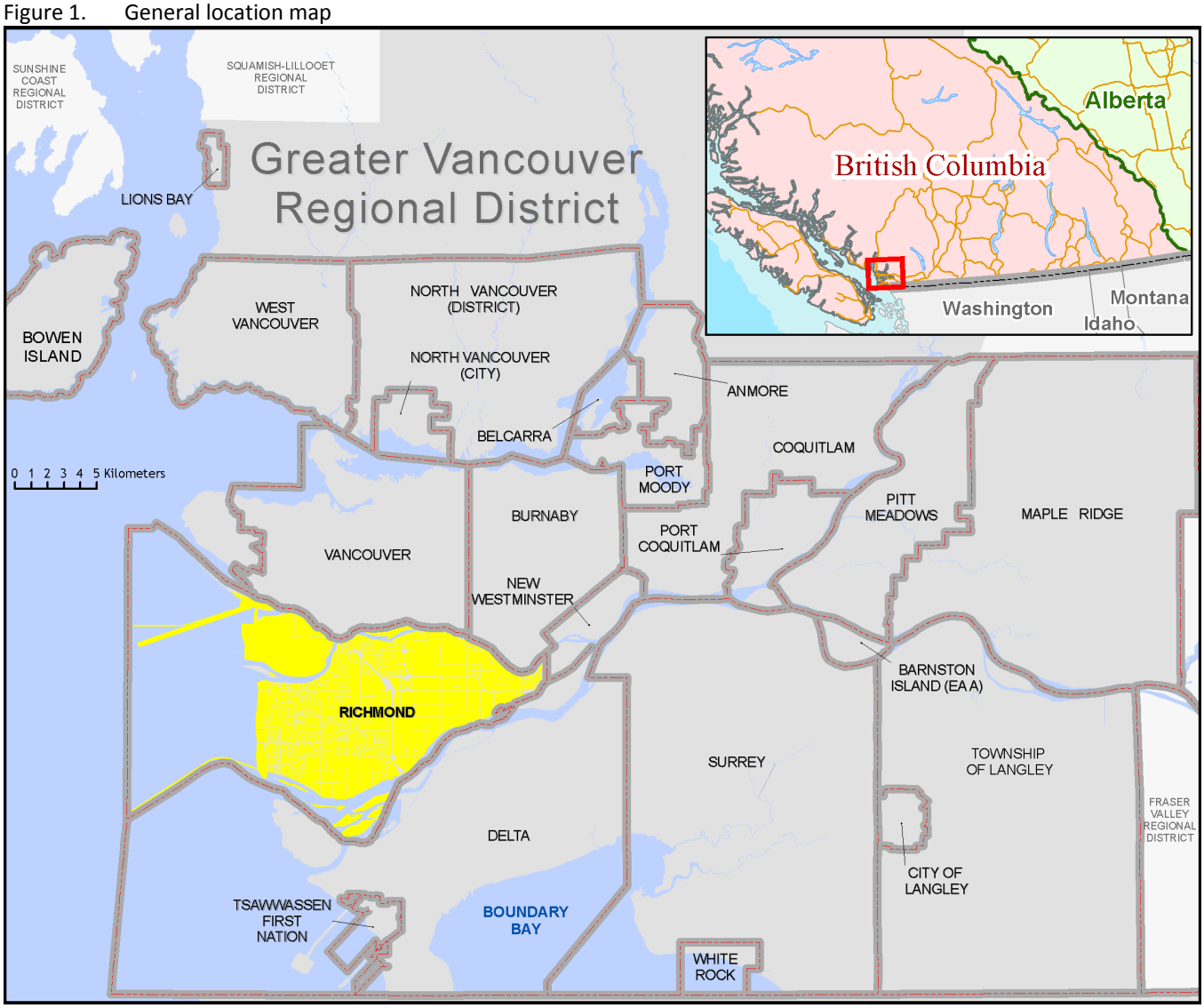
The City's Agricultural Advisory Committee was formed in 2003 to provide recommendations to Council on agricultural planning matters. Despite the ongoing development, 40% of Richmond's land area remains in the ALR. Today, agriculture continues to play an important role in the local and regional economy, as well as a major land use sector in the city.

[1] Much of the background information in this section of the report is taken from "Richmond Agricultural Profile Report" (2002) and the 2011 Agricultural Census.

General Community Information

The City of Richmond is located south of Vancouver on the mainland of British Columbia. Richmond's total area (including water) is 25,725 hectares[3]. The city is bordered by Vancouver and Burnaby to the north, the Fraser River to the South, New Westminster to the east, and the Strait of Georgia to the west. Richmond is part of the Greater Vancouver Regional District.

Figure 1. General location map



[3] Government of British Columbia; Ministry of Community, Sport & Cultural Development, Local Government Statistics http://www.cscd.gov.bc.ca/lgd/infra/library/regional_stats11_summary.pdf

AGRICULTURAL LAND RESERVE

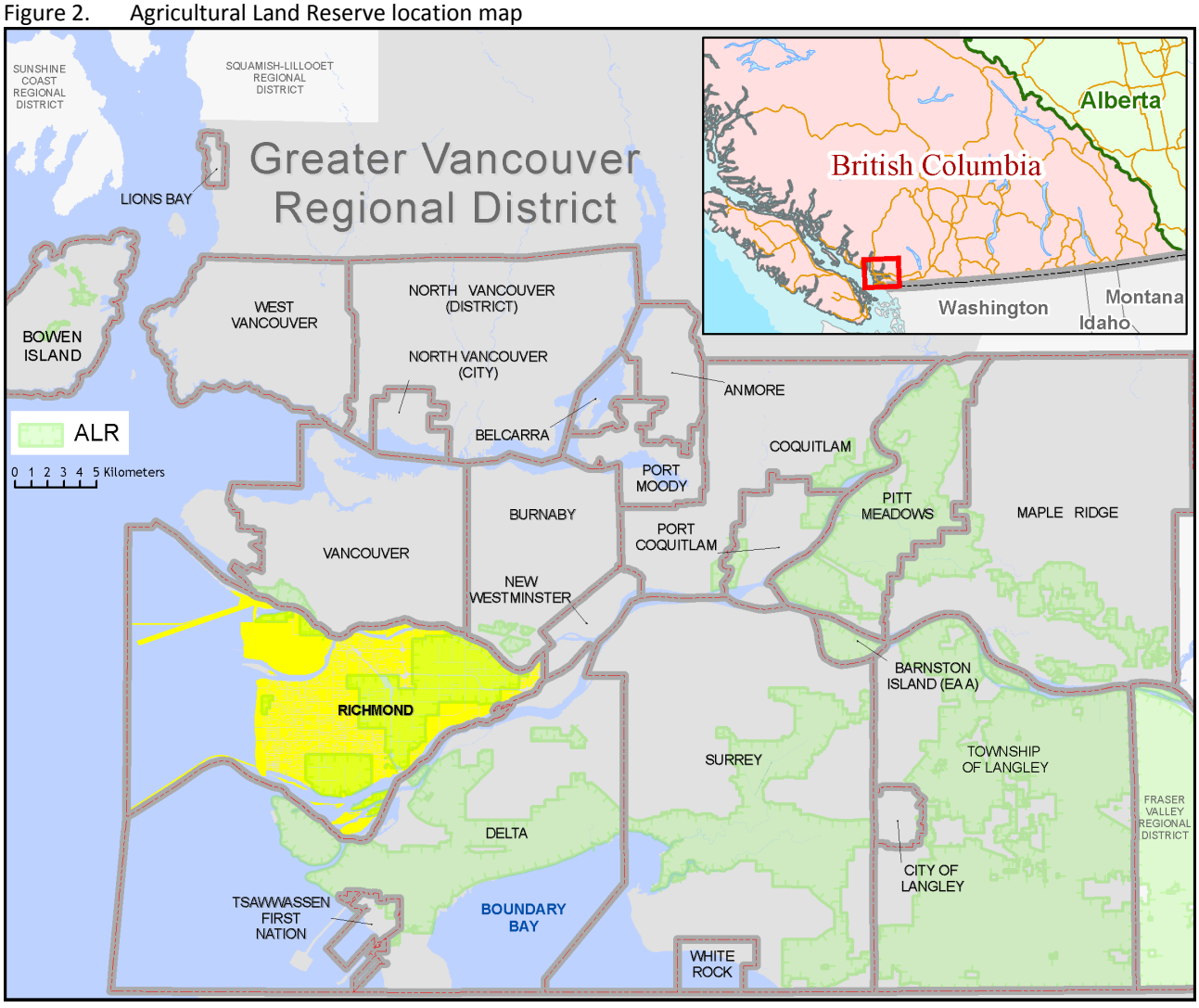
The Agricultural Land Reserve (ALR) is a provincial land use zone that was designated in 1973 in which agriculture is recognized as the priority use. Within the ALR, farming is encouraged and non-agricultural uses are controlled.

There are 60,554 hectares[4] of ALR land within the Greater Vancouver Regional District (shown in Figure 2); 5,176 hectares[5] or 8.5% is within Richmond.

The land area of Richmond is 11,985 hectares[6]. With 5,176 hectares[3] in the ALR, over 43 % of the land area of the city is in the ALR. This area includes:

- 4,756 hectares in surveyed parcels
- 420 hectares outside surveyed parcels
  - 395 hectares of designated rights-of-way
  - 25 hectares of foreshore

Figure 2. Agricultural Land Reserve location map



[4] Provincial Agricultural Land Commission (ALC) Annual Report 2009/10 & 2010/11 Pg 39. http://www.alc.gov.bc.ca/publications/Annual_Report_2009-10_and_2010-11.pdf.

[5] Agricultural Land Commission, ALR mapping, Land and Resource Data Warehouse, 2010-01-31 (area calculated in GIS).

[6] Calculated in GIS.

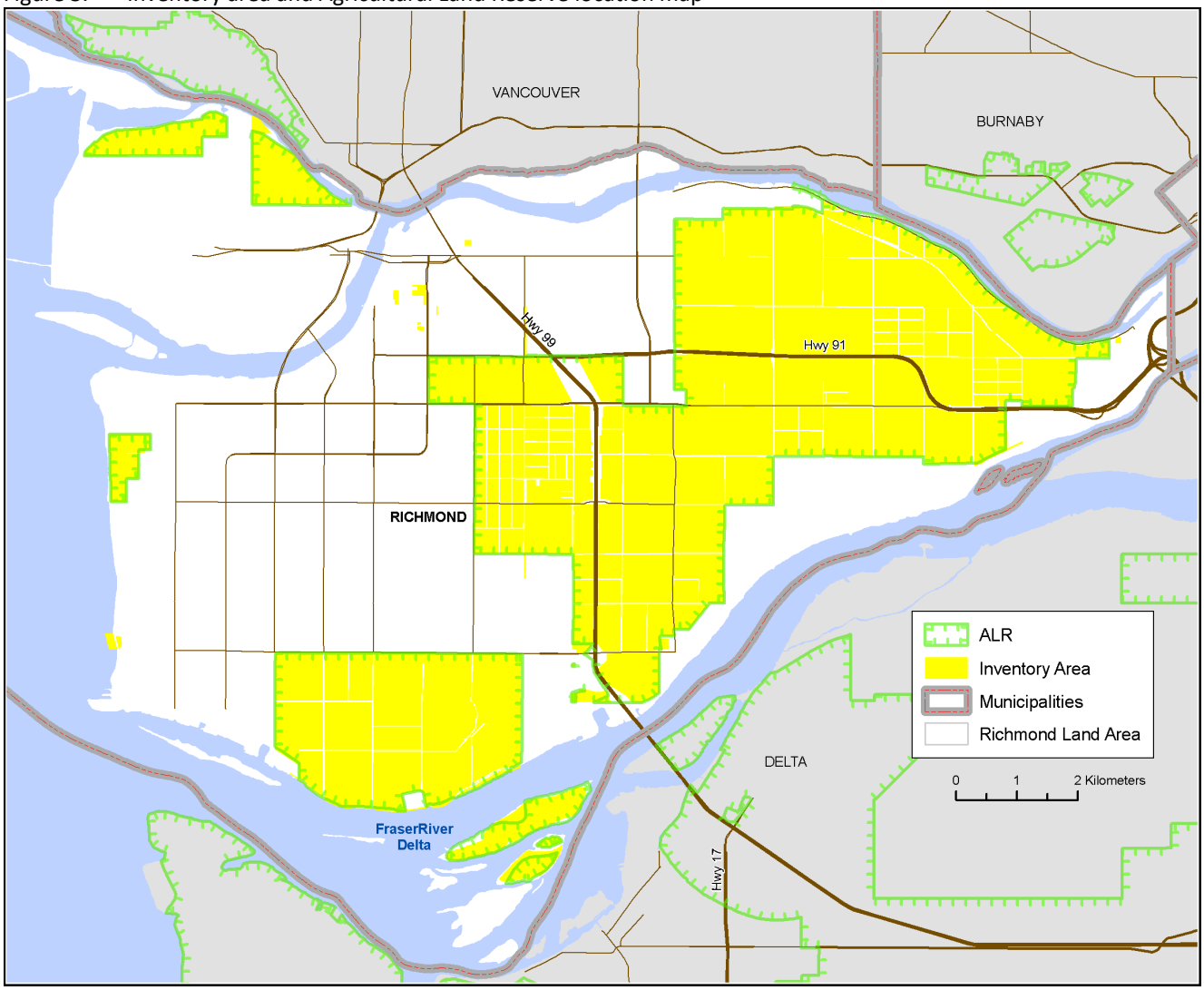
INVENTORY AREA

The total inventory area encompasses 2,109 parcels with a combined area of 4,833 hectares, or over 40% of the land area in Richmond. Included are all parcels:

- completely or partially within the Agricultural Land Reserve
- within Metro Vancouver's Regional Growth Strategy "Agriculture" designation
- within Metro Vancouver's Regional Growth Strategy "Rural" designation and greater than 1 acre
- classified by BC Assessment as having "Farm" status for property tax assessment

The amount of ALR land included in the inventory area is 4,756 hectares located on 2,093 parcels. This area is almost 92% of the ALR within Richmond. The remaining 8% of the ALR was excluded from the inventory as it is in parcels less than 100 square metres or outside surveyed land parcels in designated rights-of-way or foreshore.

Figure 3. Inventory area and Agricultural Land Reserve location map



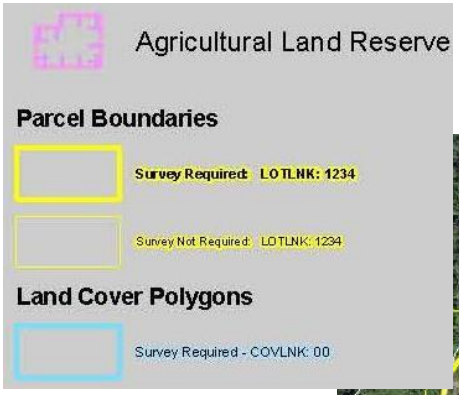
Agricultural Land Use Inventory

INVENTORY METHODOLOGY

AgFocus is an Agricultural Land Use Inventory System developed by BC Ministry of Agriculture's Strengthening Farming Program. AgFocus employs a "windshield" survey method designed to capture a snapshot in time of land use and land cover on legal parcels. For more information on AgFocus, please refer to these documents available from the Strengthening Farming Program:

- AgFocus – A Surveyor's Guide to Conducting an Agricultural Land Use Inventory
- AgFocus – Field Guide to Conducting an Agricultural Land Use Inventory
- AgFocus – A GIS Analyst's Guide to Agricultural Land Use Inventory Data

The Richmond land use inventory was conducted in the summer of 2010 by a professional agrologist assisted by a GIS technician and a driver[7]. The survey crew visited each property and observed land use, land cover, and agriculture activity from the road. Where visibility was limited, data was interpreted from aerial photography in combination with local knowledge. The technician entered the survey data into a database on a laptop computer.



Field survey maps provided the basis for the survey and included:

- The legal parcel boundaries (cadastre)[8]
- Unique identifier for each legal parcel
- The preliminary land cover polygon boundaries (digitized prior to field survey using aerial photography)
- Unique identifier for each preliminary land cover polygon
- The boundary of the Agricultural Land Reserve (ALR)
- Base features such as streets, street names, watercourses and contours
- Aerial photography

[7] Vehicle and driver provided by the City of Richmond.

[8] Cadastre mapping (2010) was provided by the City of Richmond through the Integrated Cadastral Information Society and compiled by Metro Vancouver Regional District staff.

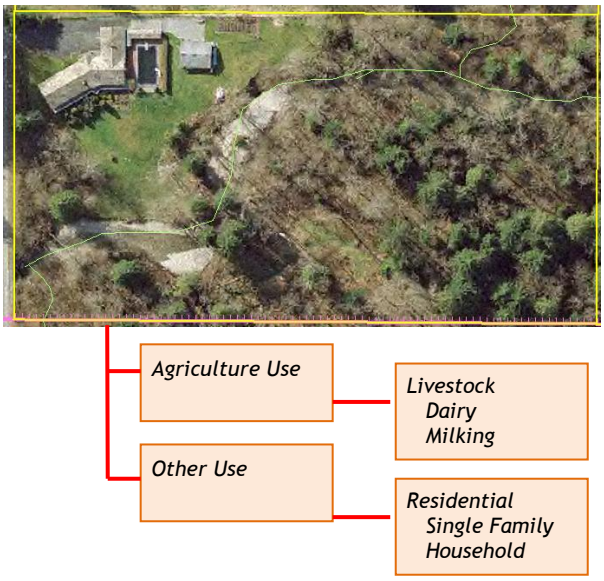
DESCRIPTION OF THE DATA

For each property in the study area, data was collected on general land use and land cover. For properties with agriculture present, data was collected on agricultural practices, irrigation, crop production methods, livestock, agricultural support (storage, compost, waste), and activities which add value to raw agricultural products.

Once acquired through the survey, the data was brought into a Geographic Information System (GIS) to facilitate analysis and mapping. Digital data, in the form of a tabular database and GIS spatial layers (for maps), may be available with certain restrictions through a terms of use agreement.

General land use:
Up to two general land uses (e.g. residential, commercial) were recorded for each property based on an assessment of overall economic importance, the property's tax status, and/or the extent of the land use. The survey for general land use focuses solely on human use and considers:

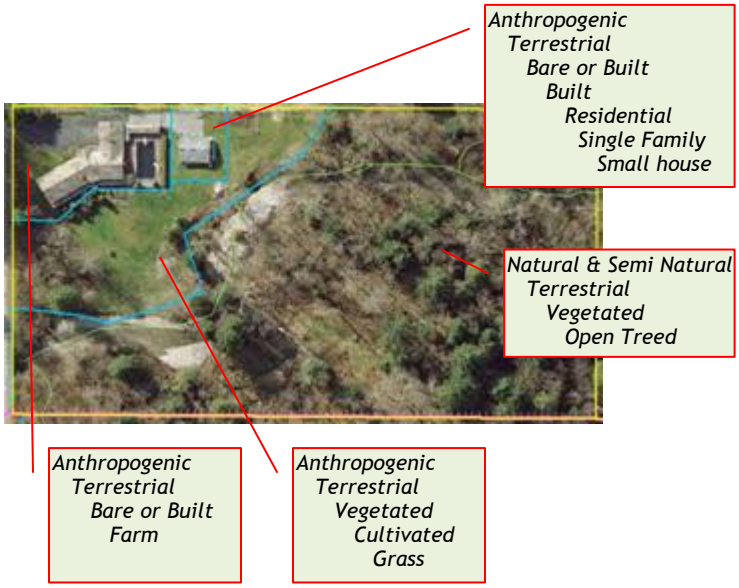
- The actual human use of land and related structures and modifications to the landscape
- Use-related land cover (where land cover implies a use or is important to interpreting patterns of use)
- Declared interests in the land (which may limit use) such as parks



In addition, the availability of non-farm use properties for future farming was assessed based on the amount of potential land for farming on the property and the compatibility of existing uses with future farming activities.

Land cover:
Land cover refers to the biophysical features of the land (e.g. crops, buildings, forested areas, woodlots, streams). Land cover was surveyed by separating the parcel into homogeneous components and assigning each a description. Prior to field survey, polygons were delineated in the office using orthophotography. Further delineation occurred during the field survey until one of the following was achieved:

- Minimum polygon size (500 sq m ~5400 sq ft) or minimum polygon width (10 m ~33 ft)
- Polygon is homogeneous in physical cover and homogeneous in irrigation method
- Maximum level of detail required was reached



In most cases, more than one land cover was recorded for each parcel surveyed.

Agricultural practices: Surveyors recorded agricultural practices associated with crops or livestock activities. For example, if a forage crop was being harvested for hay, it was recorded. Irrigation was also recorded, including the type of system used.

Agricultural crop production: Crop production and crop protection methods observed on the parcel were recorded such as wildlife scare devices, temperature or light control, or organic production. Organic production is not always visible and may have been recorded based on local knowledge or farmer interviews.

Livestock: Livestock operations and confinement methods along with the scale of the activity were estimated and recorded. Livestock not visible at the time of survey may have been inferred based on grazed pastures, manure storage, size of barn and other evidence.

Agricultural support: Ancillary agricultural activities, such as storage, compost, or waste, supporting the production of a raw commodity on a farm unit were recorded.

Agricultural value added: Activities that add value to a raw commodity where at least 50% of the raw commodity is produced on the farm unit were recorded. This value-added activity included processing, direct sales and agri-tourism activities.

PRESENTATION OF THE DATA

The data is presented in the form of summarized tables and charts. Absolute data values are preserved throughout the summarization process to maintain precision. Data values are rounded to the nearest whole number during the final formatting of the summarized tables and charts. As a result, data presented in the summarized tables and charts may not appear to add up correctly.

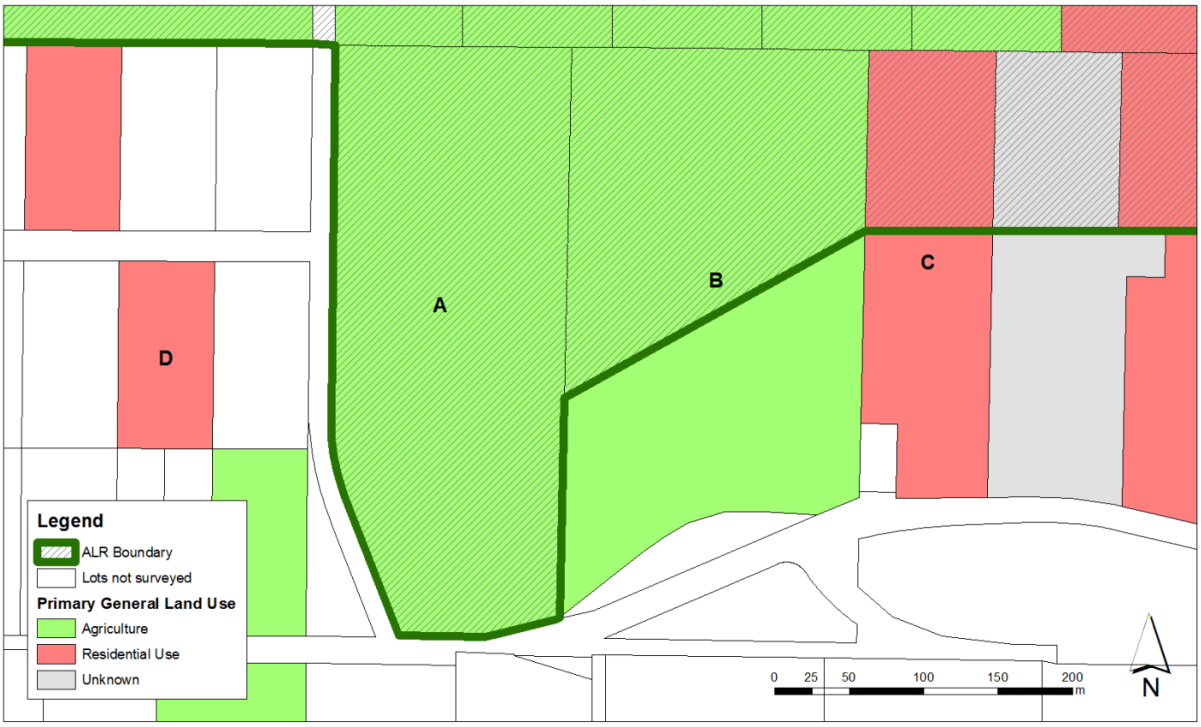
DETERMINATION OF PARCELS WITHIN THE ALR

Since much of the following analysis is parcel based, it is important to note that the ALR boundaries are not always coincident with parcel boundaries. As a result, many parcels have only a portion of their area in the ALR.

Figure 4 illustrates the frequent misalignment between parcel boundaries and the ALR boundary. Given that the dark green line represents the ALR boundary, Lot A is completely in the ALR and Lots B and C have a portion of their area in the ALR. Lot D is completely outside the ALR.

Many of the results presented in this report include 3 separate totals: the total parcel area, the portion of the parcel inside the ALR, and the portion of the parcel outside the ALR.

Figure 4. Parcel inclusion in the ALR



1. Land Cover and Farmed Area

Land cover describes the biophysical material at the surface of the earth and is distinct from land use which describes how people utilize the land.

Land use is surveyed by assigning the parcel up to two land uses. Some examples of land use are Residential, Commercial, and Industrial. Refer to Section 2 of this report for more information on land use.

Land cover is surveyed by separating the parcel into homogeneous components and assigning each a description such as landscape lawn, natural open treed, anthropogenic wetland, blueberries, road, or small single family house. Most surveyed parcels have numerous different land cover types with each describing a different area of the parcel. Land cover more closely approximates the actual area of land in agricultural production or "Farmed" than land use.

Four land cover types are considered "Farmed":

- Cultivated Field Crops: vegetation under cultivation for harvest or pasture including land temporarily set aside from farming and perennial crops that were not harvested or grazed in the current growing season
- Farm Infrastructure: built structures associated with farming such as barns, stables, corrals, riding rings, and their associated yards
- Greenhouses: permanent enclosed glass or poly structures with or without climate control facilities for growing plants and vegetation under controlled environments
- Crop Barns: permanent enclosed structures with non-translucent walls for growing crops such as mushrooms or bean sprouts

Forage and pasture field crops which have not been cut or grazed during the current growing season (unused), unmaintained field crops, and unmaintained greenhouses are considered "Farmed" land covers but are considered inactive.

Natural pasture and rangeland are fenced areas with uncultivated (not sown) natural or semi-natural grasses, herbs or shrubs used for grazing domestic livestock. These areas are considered "Grazed" and not "Farmed" although usually these areas are extensions of more intensive farming areas.

Land cover types which may support farming, such as farm residences, vegetative buffers and farm road access, are not considered "Farmed".

Table 1. Land cover and farmed area

Land cover		ALR		Outside ALR (ha)	Total area (ha)	% of inventory area
		In ALR (ha)	% of ALR			
Actively farmed	Cultivated field crops	2,607	50%	14	2,621	54%
	Farm Infrastructure	125	2%	<1	125	3%
	Greenhouses	29	< 1%	<1	30	< 1%
	Crop barns	<1	< 1%	-	<1	< 1%
Inactively farmed	Unmaintained field crops	34	1%	1	35	1%
	Unmaintained greenhouses	1	< 1%	-	1	< 1%
FARMED SUBTOTAL		**2,797**	**54%**	**16**	**2,812**	**58%**
Anthropogenic (not farmed)	Managed vegetation	550	11%	6	557	12%
	Residential footprint	126	2%	1	127	3%
	Non Built or Bare	116	2%	10	126	3%
	Transportation	96	2%	14	110	2%
	Settlement	86	2%	<1	86	2%
	Waterbodies	38	< 1%	-	38	< 1%
	Utilities	17	< 1%	4	21	< 1%
	Built up - Other	3	< 1%	1	4	< 1%
SUBTOTAL		**1,032**	**20%**	**36**	**1,069**	**22%**
Natural and Semi-natural	Vegetated	901	17%	23	924	19%
	Wetlands	25	< 1%	<1	25	< 1%
	Waterbodies	<1	< 1%	3	4	< 1%
SUBTOTAL		**927**	**18%**	**26**	**952**	**20%**
TOTAL		**4,756**	**92%**	**78**	**4,833**	**100%**
Not surveyed	Rights-of-way	395	8%			
	Foreshore	25	< 1%			
	Parcels < 100 m^2	<1	< 1%			
SUBTOTAL		**420**	**8%**			
TOTAL		**5,176**	**100%**			

Table 1 shows the extent of different land cover types across the entire inventory area.

In Richmond, 2,812 hectares of land is in "Farmed" land cover, although 36 of those hectares are "Inactively farmed" in unmaintained field crops and unmaintained greenhouses.

Refer to Maps B1 and B2 in Appendix B for more information.

Figure 5. Land cover and farmed area in the ALR

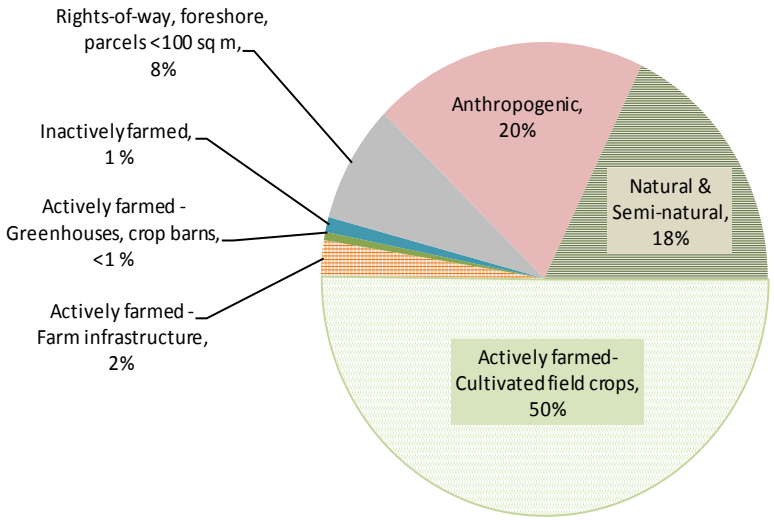


Figure 5 shows the proportions of the different land cover types across the ALR in Richmond.

Of Richmond's ALR land, 53% is "Actively Farmed" while 1% is in unmaintained field crops or unmaintained greenhouses ("Inactively farmed").

Land used in support of farming such as farm residences, vegetative buffers or roadways is not included as "Farmed".

2. Land Use and Farm Use

Land use focuses solely on human use and describes the economic function or type of establishment using the parcel. A parcel can have a variety of activities on the land, yet serve a single use. For example, two parcels are said to be "Used for farming", even if one is a dairy farm and the other is in blueberries. If one parcel is a hotel and the other is a retail store, they are both considered as "Commercial" land use.

Up to two general land uses (e.g. residential, commercial) are recorded for each parcel with each considered an equally important function of the parcel. Evaluation of land uses are based on overall economic importance, the property's tax status, and/or the extent of the land use.

Parcels where the majority of the parcel area is utilized for farming or parcels which exhibit significant evidence of intensive farming are considered "Used for farming". For a complete definition of "Used for farming", refer to the Definitions section of this report.

Many parcels "Used for farming" or "Used for grazing" are also used for other purposes such as "Residential" or "Industrial". This report does not attempt to determine which use is primary.

Table 2. Land use and farming use by parcel

Parcel land use		ALR		Outside ALR (ha)	Total area (ha)	% of inventory area	Number of parcels	% of parcels	Average parcel size (ha)
		In ALR (ha)	% of ALR area						
Used only for farming - no other use		1,321	26 %	4	1,326	27 %	594	28 %	2
Used for farming - Mixed use	Residential	1,204	23 %	6	1,210	25 %	342	16 %	4
	Transportation & communications	145	3 %	< 1	145	3 %	7	<1 %	21
	Protected area / park / reserve	98	2 %	15	113	2 %	4	<1 %	28
	Utilities	88	2 %	-	88	2 %	6	<1 %	15
	Commercial & service	61	1 %	< 1	61	1 %	7	<1 %	9
	Golf	29	<1 %	< 1	29	<1 %	1	<1 %	29
	Institutional & community	20	<1 %	-	20	<1 %	4	<1 %	5
	Recreation & leisure	19	<1 %	2	21	<1 %	1	<1 %	21
	Industrial	15	<1 %	< 1	15	<1 %	1	<1 %	15
	Transportation - airport	4	<1 %	-	4	<1 %	1	<1 %	4
	Water management	3	<1 %	< 1	3	<1 %	1	<1 %	3
USED FOR FARMING SUBTOTAL		3,006	58 %	29	3,035	63 %	969	46 %	
Not used for farming	No apparent use	454	9 %	4	458	9 %	270	13 %	2
	Residential	417	8 %	5	422	9 %	705	33 %	< 1
	Golf	273	5 %	< 1	273	6 %	21	<1 %	13
	Transportation - airport	200	4 %	6	206	4 %	4	<1 %	52
	Protected area / park / reserve	116	2 %	4	119	2 %	6	<1 %	20
	Transportation & communications	90	2 %	8	97	2 %	45	2 %	2
	Military	59	1 %	-	59	1 %	1	<1 %	59
	Institutional, community	45	<1 %	< 1	45	<1 %	27	1 %	2
	Recreation & leisure	31	<1 %	7	38	<1 %	11	<1 %	3
	Utilities	18	<1 %	2	20	<1 %	8	<1 %	2
	Commercial & service	17	<1 %	< 1	17	<1 %	16	<1 %	1
	Industrial	15	<1 %	< 1	15	<1 %	7	<1 %	2
	Water management	11	<1 %	< 1	12	<1 %	15	<1 %	< 1
	Land in transition	5	<1 %	12	17	<1 %	4	<1 %	4
NOT USED FOR FARMING SUBTOTAL		1,750	34 %	49	1,798	37 %	1,140	54 %	
TOTAL		**4,756**	**92 %**	**78**	**4,833**	**100 %**	**2,109**	**100 %**	
Not surveyed	Rights-of-way	395	8 %						
	Foreshore	25	<1 %						
	Parcels < 100 m^2	< 1	<1 %						
SUBTOTAL		420	8 %						
TOTAL		**5,176**	**100 %**						

Table 2 shows that 3,006 hectares or 58% of Richmond's ALR is on parcels "Used for farming".

Though many of the "Used for farming" parcels are also used for other purposes, over one quarter of the ALR area (26%) is solely "Used for farming".

The South Arm Islands are in the South Arm Wildlife Management Area and contain 113 hectares of land in a protected area/park that is also "Used for farming". The islands contain forage fields to attract migrant waterfowl. Land surrounding the farmed areas is not available for agricultural expansion due to the protected area designation.

Refer to Maps B3 and B4 in Appendix B for more information.

Table 3. Parcel use and land cover in the ALR

Parcel Land Use		Land Cover Category						Total	
		Farmed *		Anthropogenic (not farmed)		Natural & Semi - natural			
		In ALR (ha)	% of ALR area	In ALR (ha)	% of ALR area	In ALR (ha)	% of ALR area	In ALR (ha)	% of ALR area
Used only for farming - no other use		1,272	25 %	26	<1 %	24	<1 %	1,321	26 %
Used for farming - mixed use	Residential	1,065	21 %	121	2 %	18	<1 %	1,204	23 %
	Transportation & communications	125	2 %	19	<1 %	1	<1 %	145	3 %
	Protected area / park / reserve	54	1 %	< 1	<1 %	43	<1 %	98	2 %
	Utilities	83	2 %	5	<1 %	< 1	<1 %	88	2 %
	Commercial & service	54	1 %	3	<1 %	3	<1 %	61	1 %
	Golf	19	<1 %	10	<1 %	-	-	29	<1 %
	Institutional, community	14	<1 %	7	<1 %	-	-	20	<1 %
	Recreation & leisure	14	<1 %	2	<1 %	3	<1 %	19	<1 %
	Industrial	13	<1 %	2	<1 %	-	-	15	<1 %
	Transportation - airport	3	<1 %	1	<1 %	-	-	4	<1 %
	Water management	3	<1 %	-	-	-	-	3	<1 %
SUBTOTAL		2,718	52 %	196	4 %	93	2 %	3,006	58 %
Not used for farming		79	2 %	836	17 %	834	16 %	1,750	34 %
SUBTOTAL		2,797	54 %	1,032	21 %	927	18 %	4,756	92 %
Not surveyed	Rights-of-way							395	8 %
	Foreshore							25	<1 %
	Parcels < 100 m²							< 1	<1 %
	SUBTOTAL							420	8 %
TOTAL ALR								**5,176**	**100 %**

* Some parcels that are "Not used for farming" have "Farmed" land cover, however, the extent or intensity of the land cover is insufficient for the parcel to be considered "Used for farming". For a complete definition of "Used for farming", refer to the Definition section of this report.

Table 3 combines land use and land cover on ALR land in Richmond. For example, parcels with the mixed uses "Used for farming" and "Residential" have a total of 1,065 hectares in "Farmed" land cover, 121 hectares in "Anthropogenic" (not farmed) land cover, and 18 hectares in "Natural & Semi-natural" land cover.

Although 3,006 hectares or 58% of Richmond's ALR is on parcels "Used for farming" (Refer to Table 2), only 2,797 hectares or 54% of the ALR is actually in "Farmed" land cover as many "Used for farming" parcels are also used for other purposes. Much of the "Farmed" land cover in the ALR (21%) is on parcels also used for "Residential" purposes.

3. Availability of Land for Farming

The demand for locally grown agricultural products is anticipated to grow as the population grows[9]. This demand along with a number of other factors, such as commodity types and farm management requirements (nutrient management, bio-security), will influence agricultural land needs in the future. Growth in extensive agriculture sectors such as dairy or berry will require large increases in land base which may not be available. Future agriculture growth may come from new commodity types and intensifying land use rather than finding new land for development.

The analysis of the availability of land for farming examines how much land is available for farming, has the potential to be farmed, and the characteristics of this land.

Properties currently "Used for farming" or with some agriculture present are considered available for farming regardless of any existing non-farm use. In addition, properties with an existing use compatible with agriculture, such as Residential, are considered available for farming since the existing land use can be maintained.

Properties not currently farmed with an established non-farm use that is incompatible with agriculture are considered unavailable for farming. These properties also have very high land values making it unrealistic for a farmer to acquire and convert this land to farmland.

In Richmond, properties in the ALR and "Used for farming" have an average assessed value of $250,435 per hectare, while properties in the ALR but unavailable for farming have an average assessed value of $3,122,632 per hectare.

(Calculated using 2011 BC Assessment database – total property value)

Land is further assessed for its farming potential based on physical and environmental characteristics. Only areas in natural and semi-natural vegetation, areas in managed vegetation (managed for landscaping, dust or soil control), and non-built or bare areas are considered to have potential for farming. Areas covered with built structures, steep slopes or rocky soils and areas with operational constraints such as a very small size, are considered not to have potential for farming. For this analysis, it is assumed that removing built structures and fill piles, filling in water bodies or remediating slopes to create land with potential for farming would likely not occur.

[9] In BC, the regulated marketing system requires that over 95% of our milk, eggs, chicken and turkey be produced in BC. The need to produce these products increases in direct proportion to the population growth.

Table 4. Status of the land base with respect to farming

Land status		ALR		Outside ALR (ha)	Total area (ha)	% inventory area
		In ALR (ha)	% ALR Area			
Actively farmed	Cultivated field crops	2,607	50 %	14	2,621	54 %
	Farm Infrastructure	125	2 %	< 1	125	3 %
	Greenhouses	29	<1 %	< 1	30	<1 %
	Crop barns	< 1	<1 %	-	< 1	<1 %
ACTIVELY FARMED		2,761	53 %	15	2,776	57 %
Anthropogenic areas supporting farming	Residential footprint	49	<1 %	< 1	49	1 %
	Built up - Other	15	<1 %	< 1	15	<1 %
	Transportation	6	<1 %	< 1	6	<1 %
	Artificial Waterbodies	1	<1 %	-	1	<1 %
SUPPORTING FARMING		71	1 %	< 1	71	1 %
Unavailable for farming due to existing land use	Golf	281	5 %	< 1	281	6 %
	Protected area / park / reserve	156	3 %	16	172	4 %
	Transportation - airport	142	3 %	5	147	3 %
	Residential	91	2 %	< 1	92	2 %
	Military	59	1 %	-	59	1 %
	Transportation & communications	38	<1 %	7	45	<1 %
	Utilities	13	<1 %	2	15	<1 %
	Water management	10	<1 %	< 1	11	<1 %
	Institutional, community	10	<1 %	< 1	10	<1 %
	Recreation & leisure	10	<1 %	4	14	<1 %
	Industrial	8	<1 %	< 1	8	<1 %
	Commercial & service	3	<1 %	< 1	3	<1 %
	Land in transition	< 1	<1 %	9	10	<1 %
Unavailable for farming due to existing land cover	Built up - Other	40	<1 %	1	41	<1 %
	Residential footprint	36	<1 %	< 1	36	<1 %
	Transportation	35	<1 %	3	38	<1 %
	Waterbodies	23	<1 %	3	26	<1 %
	Wetlands	19	<1 %	< 1	19	<1 %
	Utilities	3	<1 %	3	6	<1 %
UNAVAILABLE FOR FARMING		978	19 %	55	1,033	21 %
Site limitations	Operational	37	<1 %	< 1	37	<1 %
	Flooding	1	<1 %	< 1	1	<1 %
	Drainage	-	-	2	2	<1 %
LIMITED POTENTIAL FOR FARMING		38	<1 %	3	40	<1 %
Available & with potential for farming	Natural & Semi-natural - Vegetation	549	11 %	< 1	549	11 %
	Anthropogenic - Managed vegetation	241	5 %	2	243	5 %
	Anthropogenic - Non Built or Bare	83	2 %	2	85	2 %
	Unmaintained field crops	34	1 %	< 1	35	1 %
	Unmaintained greenhouses	1	<1 %	-	1	<1 %
AVAILABLE & WITH POTENTIAL FOR FARMING		908	18 %	5	913	19 %
TOTAL		**4,756**	**92 %**	**78**	**4,833**	**100 %**
Not surveyed	Rights-of-way	395	8 %			
	Foreshore	25	<1 %			
	Parcel areas < 100 sq m	< 1	<1 %			
SUBTOTAL		420	8 %			
TOTAL		**5,176**	**100 %**			

Table 4 shows that 913 hectares or 19% of the inventory area is not farmed, but is available for farming, and is not limited by existing land use, land cover, or other site limitations. Almost all of this is ALR land with only 5 hectares outside.

The Garden City Lands are in the ALR and are comprised of 55 hectares of "Natural & Semi-natural vegetation". The lands are the focus of an ongoing study which aims to determine the future uses of the area. This report considers the Garden City Lands "Available & with potential for farming" as no land use decisions have been reached at the date of publication.

Refer to Map B5 in Appendix B for more information.

Figure 6. Availability and potential of ALR lands for farming

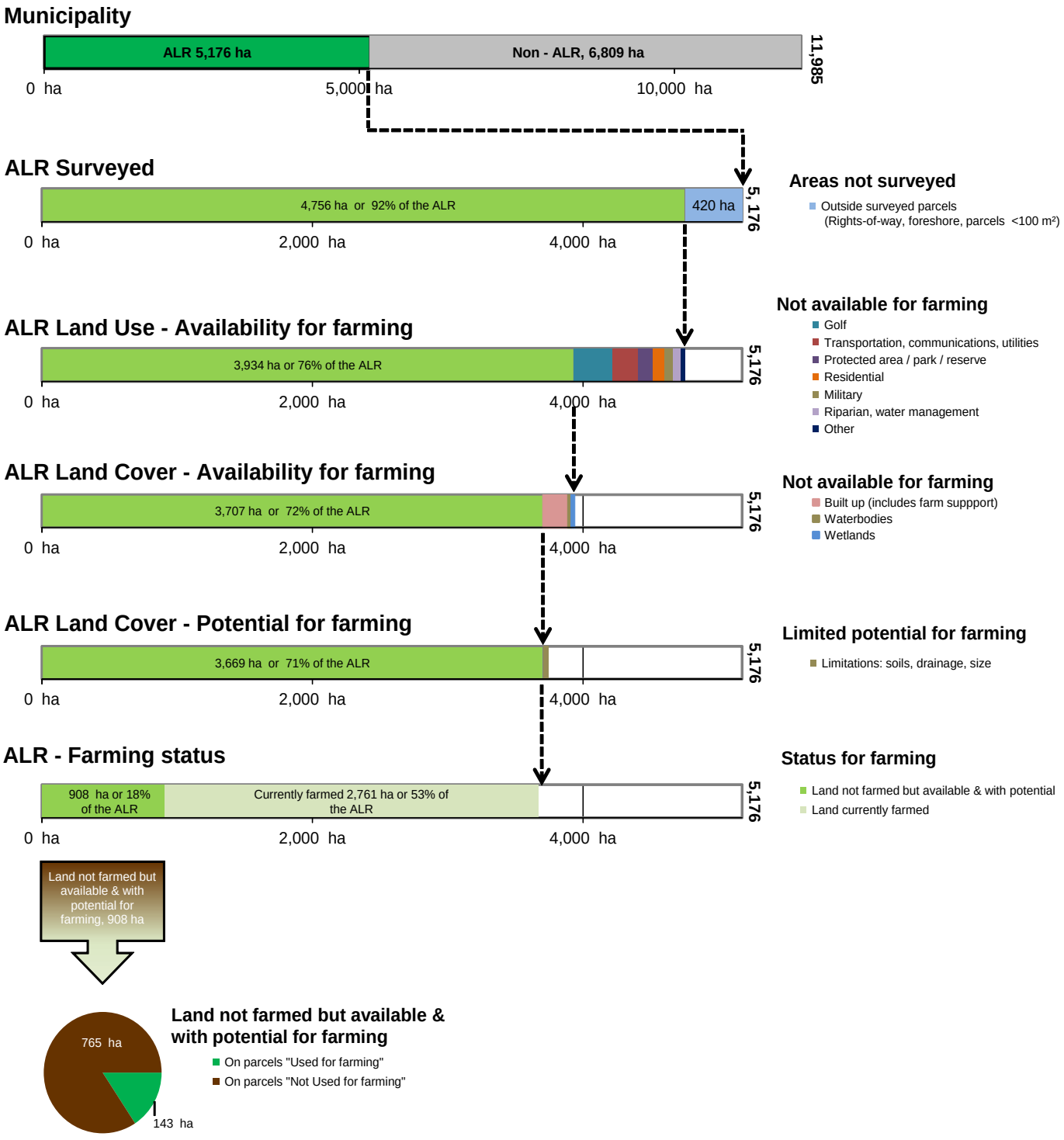


Figure 6 demonstrates that 3,669 hectares, or 71%, of Richmond's ALR is currently available for farming once road rights-of-way, golf courses, protected areas, parks, residential footprints, and other land uses and land covers incompatible with agriculture are taken into account. Of those 3,669 hectares, 2,761 hectares are actively farmed and 908 hectares are available and have potential for farming.

Refer to Map B6 in Appendix B for more information.

CHARACTERISTICS OF NOT FARMED BUT AVAILABLE ALR LANDS

The potential for future agriculture expansion is affected by the size of the area available. Small areas can effectively be used for some intensive agricultural operations such as mushrooms, floriculture, greenhouses, poultry, and container nurseries. Small areas are also suitable for start-up farmers, horse enthusiasts, farmers testing new technologies, or established farmers wanting to expand through leases. Despite these opportunities, small areas provide fewer farming choices than large lots. They specifically exclude dairy, hogs, and vegetable greenhouses. For example, a dairy cow produces sufficient manure per year to fertilize 0.4 hectares of forage production which means a dairy operation consisting of 50 cows would require access to 20 hectares of land. Without sufficient land area to utilize the manure as a fertilizer, the dairy operation would have to find other, more expensive, methods to handle the manure produced on the farm.

On Parcels "Used for Farming"

Table 5. Land use and cover on parcels "Used for farming" with land available for farming but not farmed

Mixed land use on "Used for farming" parcels	Number of parcels	Land not farmed but with potential for farming			Land currently farmed			% potential increase to total ALR farmed area
		In ALR (ha)	Outside ALR (ha)	Total area (ha)	In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Residential	167	69	< 1	69	561	< 1	561	2 %
Used for farming only	53	44	< 1	44	472	< 1	472	2 %
Transportation & communications	6	16	-	16	111	-	111	<1 %
Commercial & service	3	5	< 1	5	41	-	41	<1 %
Utilities	3	4	-	4	36	-	36	<1 %
Recreation & leisure	1	3	-	3	14	-	14	<1 %
Transportation - airport	1	< 1	-	< 1	3	-	3	<1 %
Protected area / park / reserve	1	< 1	-	< 1	13	3	17	<1 %
Golf	1	< 1	-	< 1	19	< 1	19	<1 %
Institutional, community	1	< 1	-	< 1	< 1	-	< 1	<1 %
TOTAL	**237**	**143**	**0**	**143**	**1270**	**4**	**1274**	**5 %**

Table 5 demonstrates that the largest potential increase in farmed land on parcels that are already "Used for farming" could come from properties that currently have "Residential" use or are used exclusively for farming.

Figure 7. Land cover available for farming but not farmed on parcels "Used for farming"

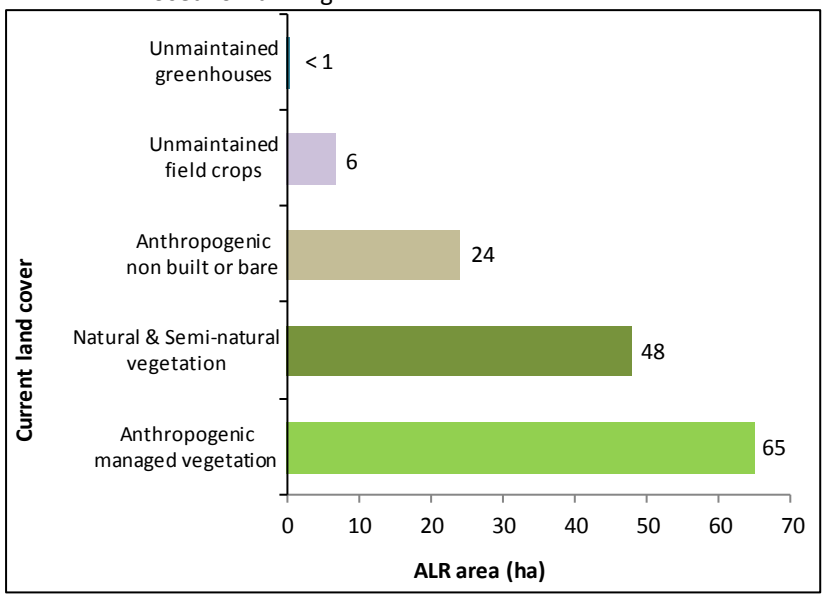


Figure 7 indicates that removing "Anthropogenic managed vegetation" would offer the greatest gains in farmed land on parcels that are already "Used for farming".

"Anthropogenic managed vegetation" mainly consists of landscaping and lawns surrounding residential uses. Converting this to agricultural use may not be supported by the landowners.

Clearing land covered with "Natural & Semi-natural vegetation" would offer other opportunities to increase the amount of farmed land on parcels that are already "Used for farming".

On Parcels "Not Used for Farming"

Table 6. Land use and cover on parcels "Not used for farming" with land available for farming

Parcel Land use		Number of parcels	Land not farmed but with potential for farming			% potential increase to total ALR farmed area
			In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Not used for farming	No apparent use	235	398	3.3	402	14 %
	Residential	180	221	< 1	221	8 %
	Transportation & communications	4	52	< 1	52	2 %
	Transportation - airport	1	38	-	38	1 %
	Institutional, community	10	19	-	19	<1 %
	Recreation & leisure	4	18	1.4	19	<1 %
	Commercial & service	5	10	-	10	<1 %
	Land in transition	1	5	< 1	5	<1 %
	Utilities	1	2	-	2	<1 %
	Industrial	1	2	-	2	<1 %
TOTAL		**442**	**765**	**5**	**770**	**28 %**

Table 6 illustrates that for parcels currently "Not used for farming", the greatest potential for increasing actively farmed land would come from parcels with "No apparent use" and parcels with "Residential" use.

Figure 8. Land cover available for farming but not farmed on parcels "Not used for farming"

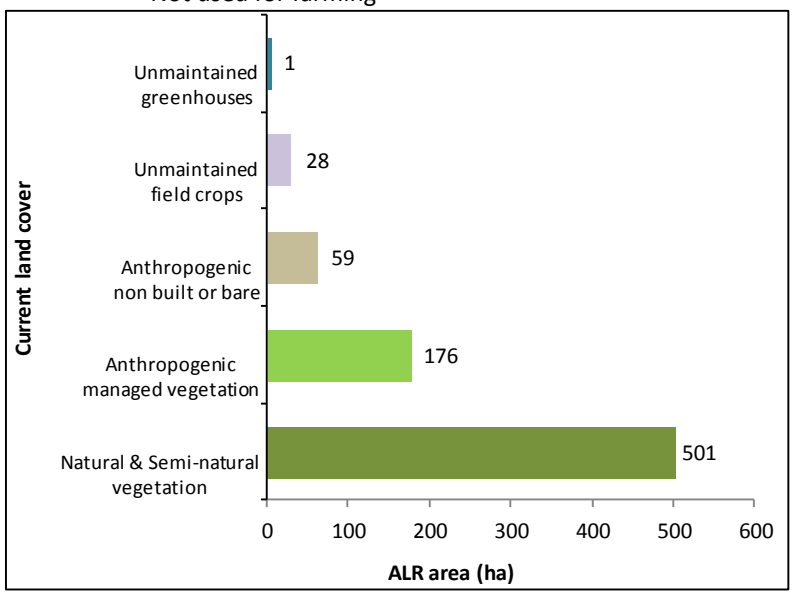


Figure 8 indicates that clearing land covered with "Natural & Semi-natural vegetation" would provide the greatest gains in farmed land on parcels currently "Not used for farming".

Figure 9. Size of areas available for farming but not farmed on parcels "Not used for farming"

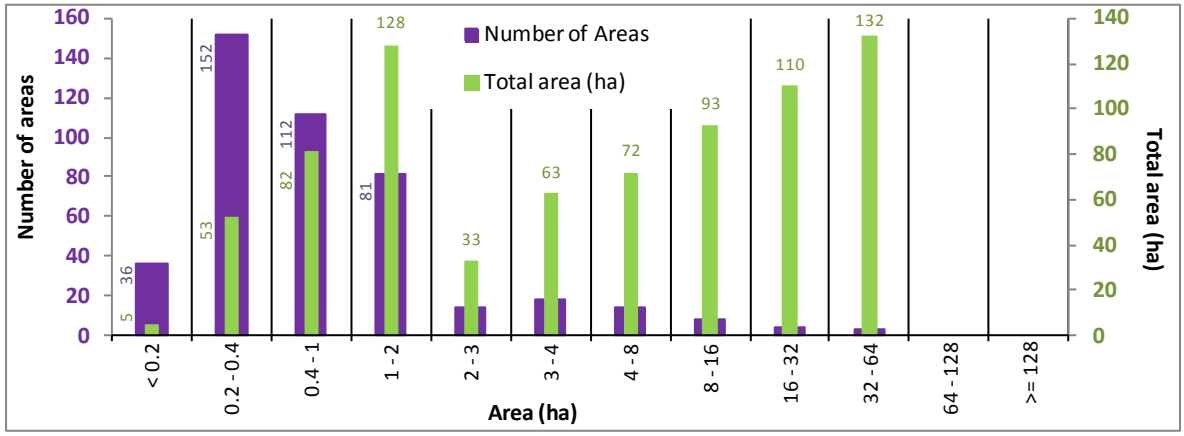


Figure 9 demonstrates that the majority of areas available for farming (381 of 442 or 86%) are less than 2 hectares in size. The smaller the area, the fewer options are available to efficiently farm. In general, areas should be 4 hectares or more to provide the widest range of farming options.

In Richmond, there are 29 areas with a combined area of 407 hectares that are greater than 4 hectares in size and are available and with potential for farming. This is 53% of the 765 hectares of ALR land available and with potential for farming.

Table 7. Small parcels available for farming but not farmed on parcels "Not used for farming"

Parcel size (ha)	"Not used for farming but available" parcels < 0.4 ha			
	Survey Area		McLennan Area	
	Number of parcels	Total area (ha)	Number of parcels	Total area (ha)
<0.2	36	5	31	3
0.2 - 0.25	10	2	6	1
0.25 - 0.3	7	2	5	2
0.3 - 0.35	16	5	13	4
0.35 - 0.4	119	43	109	39
TOTAL	**188**	**58**	**164**	**49**

Table 7 compares the number of small ALR parcels "Not used for farming but available" in the survey area (see Figure 9) to the number of small parcels in the McLennan Area (shown in the inset on Map B5 in Appendix B).

87% (164 out of 188) of all "Not used for farming but available" parcels less than 0.4 hectares are in Richmond's McLennan Area.

The McLennan area is highly parcelized and contains many small lots which pre-date the ALR. Most of the area is capable of supporting a wide range of crops and is available for farming[10].

Richmond's "Agricultural Viability Strategy" recommends that non-farm uses be discouraged in order to preserve land availability for future agricultural use. Limited road access to portions of the area helps prevent the development of permanent non-farm uses[10].

Properties that were identified as unavailable for farming due to land cover/land use could become available for agriculture if existing limitations were removed.

Refer to Map B5 in Appendix B for more information.

[10] *Richmond Agricultural Viability Strategy (2003)*

4. Farming Activities

CULTIVATED FIELD CROPS

Cultivated field crops are captured in a geographical information system (GIS) at the field or land cover polygon level by crop type (vegetables, forage or pasture, berries, etc.). Each crop type is then summarized to total land area and evaluated for field size characteristics.

Included with cultivated field crops is fallow farmland, inactively farmed land (i.e. forage or pasture crops which have not been harvested or grazed this season) and land set temporarily set aside for wildlife or other purposes. Also included is bare cultivated land or land under preparation for planting as it is assumed these lands will be planted during the survey season. Excluded are crops grown in crop cover structures such as greenhouses or mushroom barns.

Cultivated field crops in Richmond are described by eleven crop groupings:

- **Berries**: cranberries, blueberries, strawberries, raspberries
- **Vegetables**: mixed vegetables, sweet corn, potatoes, cole crops, cucurbits, legumes, leafy vegetables
- **Forage, pasture**: grass, legumes, forage corn
- **Nursery, tree plantations**
- **Other**: bare cultivated land, crop transition, fallow land, cover grass
- **Cereals**: oats
- **Tree fruits**: apples, cherries
- **Turf**
- **Vines**: grapes
- **Floriculture**
- **Nut trees**: hazelnut/filbert

Table 8. Main field crop types by area

Type	ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
	In ALR (ha)	% of ALR			
Berries	1,431	28%	2	1,433	54%
Vegetables	557	11%	< 1	558	21%
Forage, pasture	481	9%	10	491	19%
Nursery, tree plantations	62	1%	1	64	2%
Other*	57	1%	< 1	57	2%
Cereals	37	< 1%	< 1	37	1%
Tree fruits	6	< 1%	< 1	7	< 1%
Turf	3	< 1%	-	3	< 1%
Vines	3	< 1%	-	3	< 1%
Floriculture	2	< 1%	< 1	3	< 1%
Nut trees	< 1	< 1%	-	< 1	< 1%
TOTAL	**2,641**	**51%**	**15**	**2,656**	**100%**

* Other. Includes bare cultivated land, fallow land (cultivated land that has not been seeded or planted for one or more growing season), land in crop transition, and land planted in cover grass or under mulch to manage soil moisture/erosion associated with a cultivated crop.

Table 8 shows the 11 main field crop types produced on the 2,656 hectares of cultivated land in Richmond.

Berries are the most common type of cultivated field crop accounting for 54% of all cultivated land and 28% of Richmond's ALR.

Field vegetables are the second most common type of cultivated crop, accounting for 21% of all cultivated land and 11% of the ALR.

Refer to Map B7 in Appendix B for more information.

Figure 10. Main field crop types by percentage

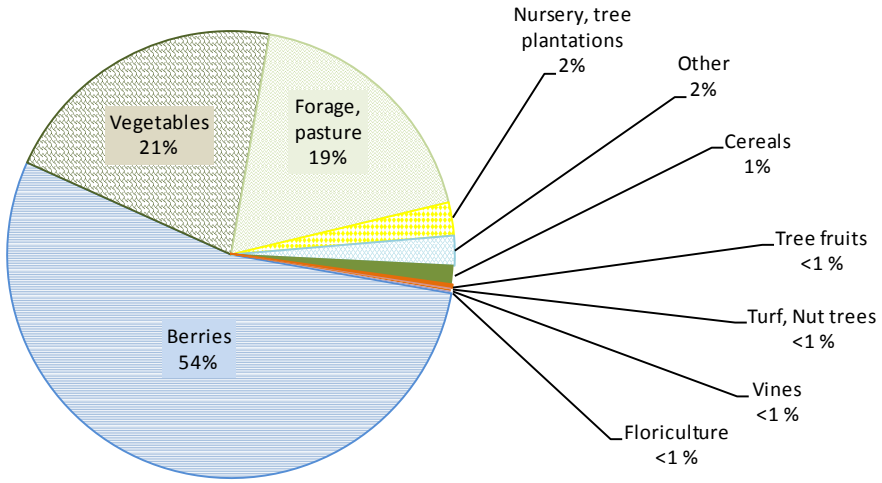


Figure 10 shows the proportion of main field crop types across Richmond's cultivated land.

"Berries" combined with "Vegetables" and "Forage, pasture" comprise 94% of all cultivated land in Richmond.

Figure 11. All cultivated field crops by field size

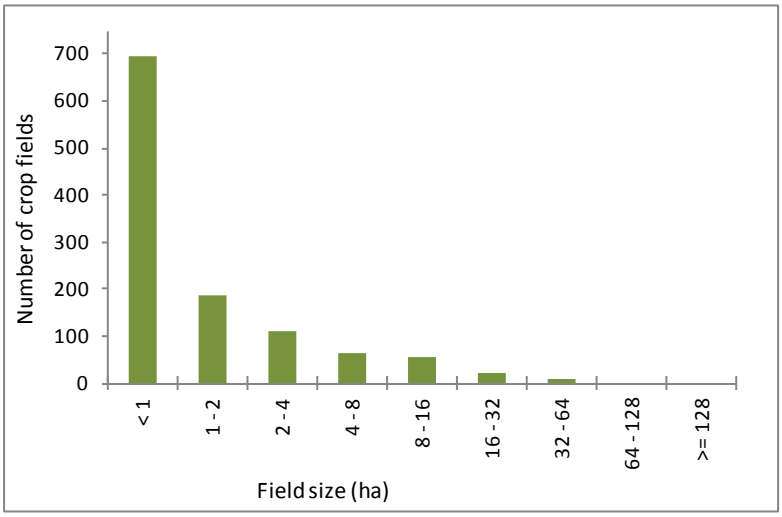


Figure 11 illustrates the number and size distribution of fields used for cultivated field crops.

In Richmond, cultivated fields are most likely to be < 1 hectare in size.

There are 1,132 individual crop fields with an average area of 2 hectares and median area of < 1 hectare.

The average size of parcels where field crops occur is 4 hectares.

Refer to Table A1 in Appendix A for more information.

Figure 12. Berries, vegetables, and forage, pasture fields by size

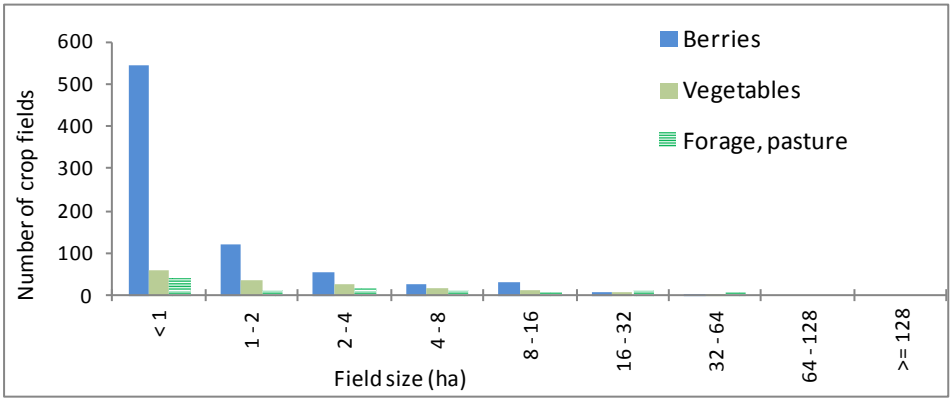


Figure 12 compares the top three main crop types by field size.

"Berries", "Vegetables" and "Forage, pasture" fields occur on a wide range of field sizes. "Berry" fields less than 1 hectare occur the most frequently.

Refer to Table A1 in Appendix A for more information.

Berry crops

Berry crops are primarily perennials. Perennial berry crops do not change frequently as they require several years to mature and some crop types require extensive land preparation. Strawberries are a perennial plant which is usually rotated or grown on different land each year to minimize build-up of crop-specific pest and disease problems. Since this inventory is a snapshot in time, the strawberry crops seen during the survey year may not be present in the same location the following year.

Two plant age categories are described:

- **Young**: Plants are young and have not reached peak production
- **Mature**: Plants are mature and are capable of reaching peak production

Table 9. Berry crops by area

Berry crops		ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
		In ALR (ha)	% of ALR			
Cranberries	Mature	845	16	< 1	845	32%
Cranberries	Young	25	< 1	2	28	1%
	Subtotal	**871**	**17**	**2**	**873**	**33%**
Blueberries	Mature	444	9%	< 1	444	17%
Blueberries	Young	34	< 1%	< 1	34	1%
Blueberries	Unmaintained	13	< 1%	-	13	< 1%
	Subtotal	**492**	**9%**	**< 1**	**492**	**19%**
Strawberries	Mature	61	1%	< 1	61	2%
Strawberries	Young	1	< 1%	-	1	< 1%
	Subtotal	**62**	**1%**	**< 1**	**62**	**2%**
Raspberries	Mature	5	< 1%	< 1	5	< 1%
Raspberries	Young	< 1	< 1%	-	< 1	< 1%
Raspberries	Unmaintained	2	< 1%	-	2	< 1%
	Subtotal	**7**	**< 1%**	**< 1**	**7**	**< 1%**
	TOTAL	**1,431**	**28%**	**2**	**1,433**	**54%**

Table 9 shows that Richmond has a total of 1,433 hectares in berry crops, of which more than half (873 hectares) are cranberries. The next most significant type of berry is blueberries with 492 hectares.

Refer to Map B8 in Appendix B for more information.

Figure 13. Berry fields by size

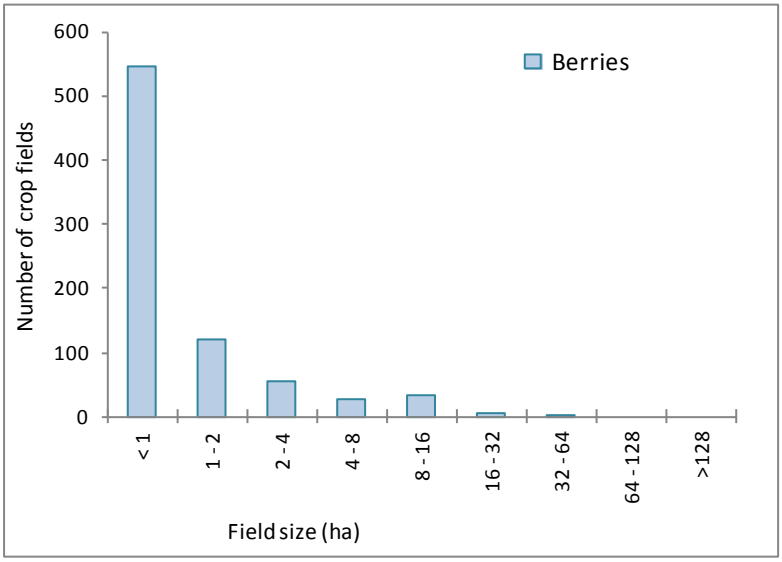


Figure 13 shows that berry fields are most likely to occur on parcels less than 1 hectare.

In Richmond, there are 794 individual berry fields with an average area of 2 hectares and median area of < 1 hectare.

The average parcel size where berry crops occur is 2 hectares.

Refer to Table A2 in Appendix A for more information.

Figure 14. Blueberry, cranberry and strawberry fields by size

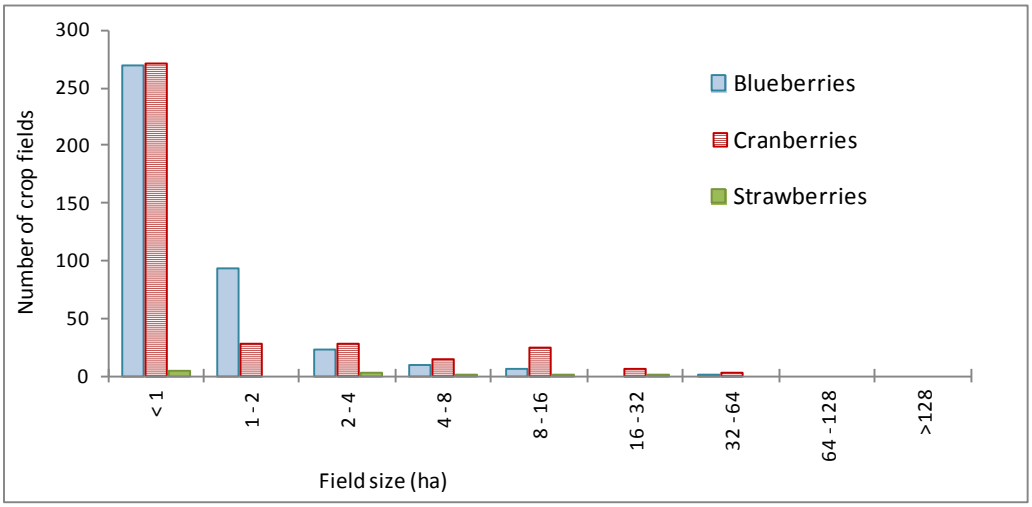


Figure 14 shows that blueberries, cranberries and strawberries occur on nearly all field sizes where berries are present.

There are 401 blueberry fields with an average crop area of 1 hectare, median area of < 1 hectare, and average parcel size of 2 hectares.

In comparison, there are 375 cranberry fields with an average crop area of 2 hectares, median crop area of < 1 hectare, and average parcel size of 3 hectares.

Refer to Table A2 in Appendix A for more information.

Vegetable crops

Vegetable crops are either annual, such as potatoes or lettuce, or perennial such as rhubarb and asparagus. Annual vegetable crops are usually rotated or grown on different land each year to minimize build-up of crop-specific pest and disease problems and avoid exhausting the soil of nutrients. Since this inventory is a snapshot in time, the annual vegetable crops seen during the survey year will probably not be present in the same location the following year.

Vegetables in Richmond are described by ten crop groupings:

- **Mixed vegetables**: a variety of vegetable types cultivated in a field
- **Sweet corn**
- **Potatoes**
- **Cole crops**: may include broccoli, brussels sprouts, cabbage, cauliflower, kale, collards, kohlrabi
- **Cucurbits**: may include squash, cucumber, zucchini, (pumpkin reported separately)
- **Pumpkins**
- **Beans**
- **Peas**
- **Leafy vegetables**: may include lettuces, spinach, swiss chard, celery.
- **Unknown**: vegetables of an unknown type

Table 10. Vegetable crops by area

Vegetable crops	ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
	In ALR (ha)	% of ALR			
Mixed vegetables	298	6%	< 1	298	11%
Potatoes	127	2%	< 1	127	5%
Sweet corn	57	1%	-	57	2%
Cole crops	36	< 1%	-	36	1%
Cucurbits	15	< 1%	-	15	< 1%
Pumpkins	8	< 1%	-	8	< 1%
Beans	6	< 1%	-	6	< 1%
Peas	4	< 1%	-	4	< 1%
Leafy vegetables	3	< 1%	-	3	< 1%
Unknown	3	< 1%	-	3	< 1%
TOTAL	**557**	**11%**	**< 1**	**558**	**21%**

Table 10 presents the different vegetable crops in Richmond.

Mixed vegetables are the most common vegetable crop with 298 hectares or 11% of all cultivated land.

Refer to Map B9 in Appendix B for more information.

Figure 15. Vegetable fields by size

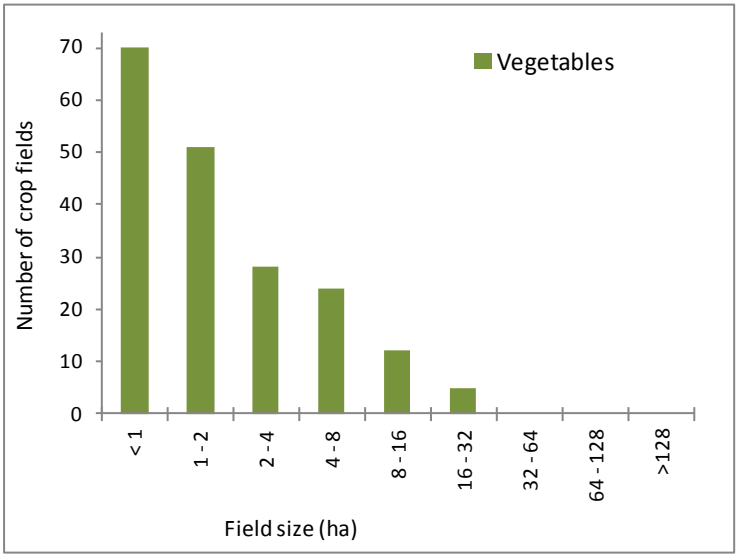


Figure 15 shows that vegetable fields are most likely to occur on parcels less than 2 hectares.

In Richmond, there are 190 individual vegetable crop fields with an average area of 3 hectares and median area of 1 hectare.

The average parcel size where vegetable field crops occur is 6 hectares.

Refer to Table A3 in Appendix A for more information.

Figure 16. Mixed vegetable, sweet corn, and potato fields by size

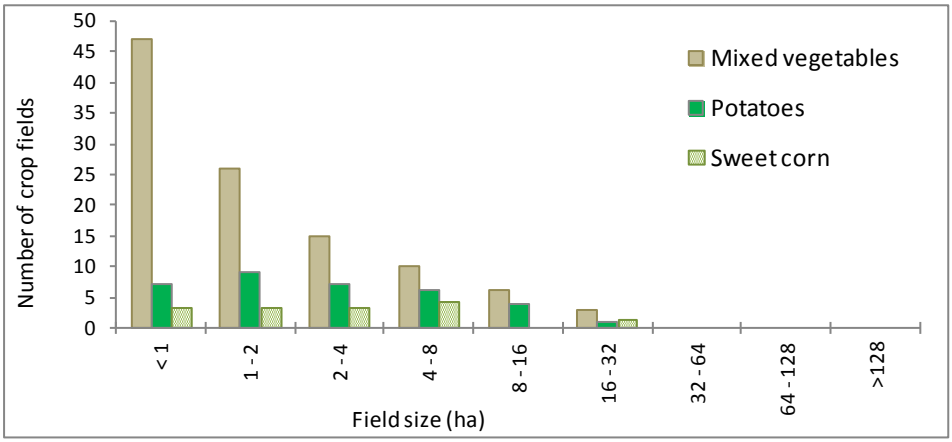


Figure 16 shows that mixed vegetables and potatoes occur on all field sizes where vegetables are grown.

In Richmond, there are 107 individual mixed vegetable fields with an average area of 3 hectares and median area of 1 hectare.

The average parcel size where mixed vegetable crops occur is 6 hectares.

Refer to Table A3 in Appendix A for more information.

Forage & pasture crops

Forage is a cultivated crop that is cut and made into silage or hay for cattle feed. Three levels of forage management are described:

- **Forage (intensively managed)**: Management includes weed control & fertilizer / manure applications and crop is cut 4-8 times per year. Often there is no fencing and crop growth is vigorous, even and thick.
- **Forage (managed)**: Management includes weed control & fertilizer / manure applications and crop is cut several times per year. Often there is no fencing and crop growth is generally healthy and even.
- **Forage (unmanaged)**: Weed management & fertilizer / manure applications are minimal. Crop is cut only once per year. Crop growth is uneven with weeds.

Pasture is a cultivated crop that is used for grazing only and is not cut. Two levels of management are described:

- **Pasture (managed)**: Management includes weed control & fertilizer / manure applications. Usually fields are large to accommodate equipment. Fencing is in good condition and crop growth is vigorous with few weeds.
- **Pasture (unmanaged)**: Weed management & fertilizer / manure applications are minimal. Fencing is in good condition. Crop is varied (some weeds) and growth is uneven with signs of animal dung.

Some areas are used for both forage & pasture:

- **Forage & pasture (managed)**: Crop is cut 1 to 3 times per year and made into silage or haylage. Also used for grazing for 1 to 3 months per season. Fencing is in good condition and crop growth is reasonably even with few weeds. Usually associated with dairy operations.

Unknown refers to forage or pasture crops where the practice could not be determined.

Unused refers to forage or pasture which has not been cut or grazed during the current growing season.

Unmaintained refers to forage or pasture which has not been cut or grazed during the current growing season, has not been maintained for several years, and probably would not warrant harvest.

Table 11. Forage & pasture crops by area

Forage & pasture crops		ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
		In ALR (ha)	% of ALR			
Forage ^	Grass	102	2%	4	105	4%
Forage ^	Mixed grass / legume	10	< 1%	3	13	< 1%
Forage (managed)	Grass	158	3%	< 1	158	6%
Forage (managed)	Mixed grass / legume	1	< 1%	-	1	< 1%
Forage (managed)	Forage corn	108	2%	< 1	108	4%
Forage (intensively managed)	Grass	7	< 1%	< 1	7	< 1%
	Subtotal	**385**	**7%**	**7**	**392**	**15%**
Pasture ^	Grass	12	< 1%	< 1	12	< 1%
Pasture ^	Mixed grass / legume	3	< 1%	-	3	< 1%
Pasture (managed)	Grass	48	< 1%	< 1	48	2%
Pasture (unmanaged)	Grass	2	< 1%	< 1	3	< 1%
Pasture (unmanaged)	Mixed grass / legume	1	< 1%	< 1	2	< 1%
	Subtotal	**66**	**1%**	**1**	**68**	**3%**
Forage & pasture (managed)	Grass	3	< 1%	< 1	4	< 1%
	Subtotal	**3**	**< 1%**	**< 1**	**4**	**< 1%**
Forage or pasture	Unknown	23	< 1%	1	24	< 1%
	Subtotal	**23**	**< 1%**	**1**	**24**	**< 1%**
Unmaintained	Mixed grass / legume	3	< 1%	< 1	3	< 1%
	Subtotal	**3**	**< 1%**	**< 1**	**3**	**< 1%**
	TOTAL	**481**	**9%**	**10**	**491**	**18%**

^ Forage or pasture where the level of management could not be determined.

Table 11 shows that there is significantly more forage than pasture in Richmond. Grass is the main forage crop type.

Refer to Map B10 in Appendix B for more information.

Figure 17. Forage & pasture fields by size

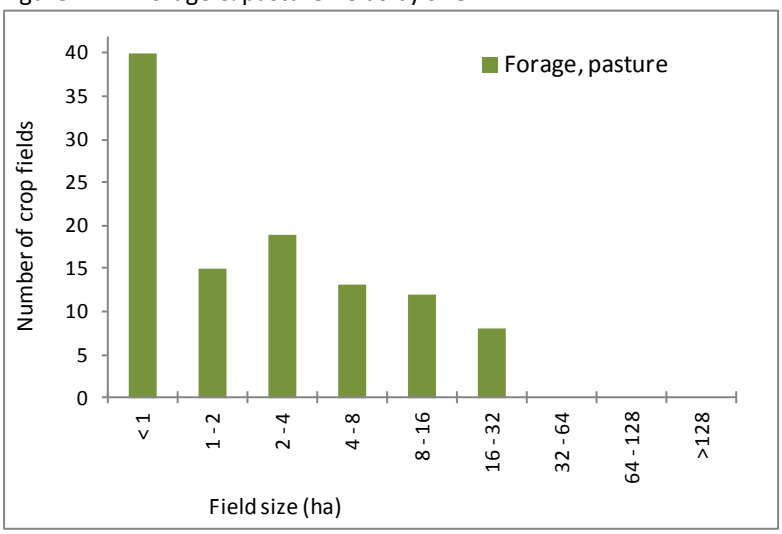


Figure 17 shows that "Forage, pasture" fields are most likely to be < 1 hectare.

In Richmond, there are 107 individual "Forage, pasture" fields with an average area of 5 hectares and median area of 2 hectares.

The average size of parcels where "Forage & pasture" occurs is 11 hectares.

Refer to Table A4 in Appendix A for more information.

Figure 18. Forage & pasture fields by size and type

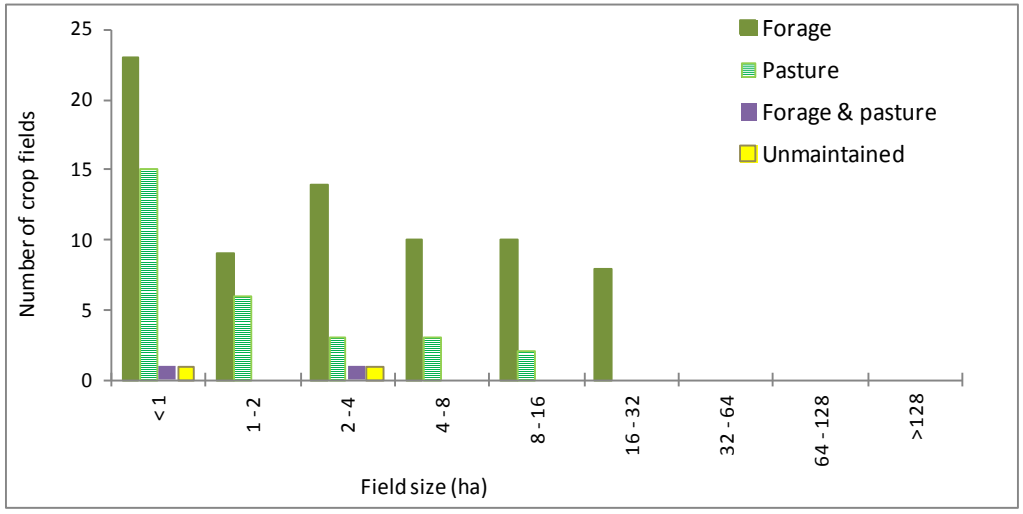


Figure 18 illustrates the variation in field sizes between forage, pasture, forage & pasture, and unmaintained pasture or forage fields.

Only forage fields occur on parcels larger than 16 hectares.

Forage fields are generally larger than pasture fields mainly due to harvesting equipment requirements and fencing costs.

Refer to Table A4 in Appendix A for more information.

Top 20 Individual Crops

Table 12. Top 20 crop types by area

Cultivated field crop	ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
	In ALR (ha)	% of ALR			
Cranberries	871	17%	2	873	33%
Blueberries	478	9%	< 1	478	18%
Mixed vegetables	298	6%	< 1	298	11%
Forage (managed)	267	5%	< 1	267	10%
Potatoes	127	2%	< 1	127	5%
Forage^	112	2%	4	115	4%
Strawberries	62	1%	< 1	62	2%
Sweet corn	57	1%	-	57	2%
Pasture (managed)	48	< 1%	< 1	48	2%
Nursery	45	< 1%	< 1	45	2%
Oats	35	< 1%	< 1	35	1%
Cole crops	27	< 1%	-	27	1%
Forage or pasture unknown	23	< 1%	1	24	< 1%
Crop transition	24	< 1%	-	24	< 1%
Pasture^	15	< 1%	< 1	15	< 1%
Cucurbits	15	< 1%	-	15	< 1%
Blueberries (Unmaintained)	13	< 1%	-	13	< 1%
Fallow land*	12	< 1%	-	12	< 1%
Cover grass	10	< 1%	< 1	10	< 1%
Cole crops (Unmaintained)	8	< 1%	-	8	< 1%
TOTAL	**2,548**	**49%**	**7**	**2,555**	**96%**

^ Forage or pasture where the level of management could not be determined.

* Fallow land is cultivated land that has not been seeded or planted for one or more growing seasons.

Table 12 shows the 20 individual crops that account for 96% of the cultivated land in Richmond.

Figure 19. Top 20 crop types by area

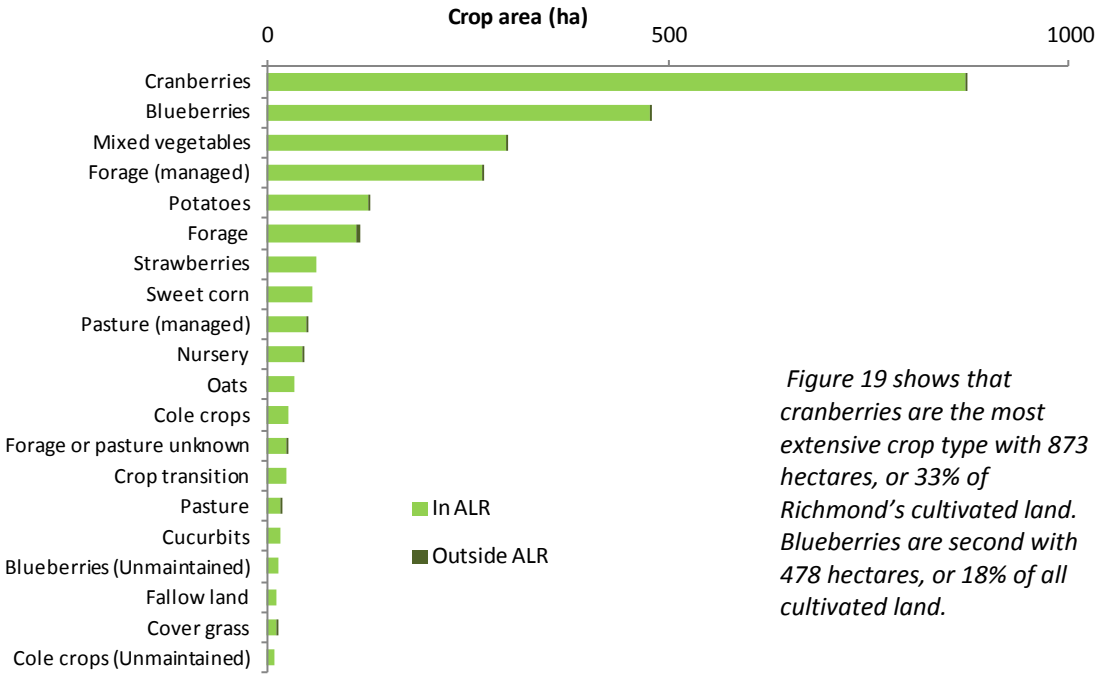


Figure 19 shows that cranberries are the most extensive crop type with 873 hectares, or 33% of Richmond's cultivated land. Blueberries are second with 478 hectares, or 18% of all cultivated land.

GREENHOUSES & CROPS BARNS

Greenhouses are structures covered with translucent material and of sufficient size for a person to work inside[11]. They are permanent enclosed glass or polyethylene (poly) structures with or without climate control facilities for growing plants under controlled environments. Non permanent structures such as hoop covers are considered an agricultural practice and are not included here.

Crop barns are permanent structures with non-translucent walls that are used for growing crops. Mushrooms and bean sprouts are frequently grown in crop barns.

Table 13. Greenhouses and crop barns by area[12]

Greenhouses & crop barns		ALR		Outside ALR (ha)	Total area (ha)	% of greenhouse area
		In ALR (ha)	% of ALR			
Crop Barn	Bean sprouts	< 1	< 1%	-	< 1	< 1%
	Subtotal	< 1	< 1%	-	< 1	< 1%
Glass greenhouse	Vegetables	3	< 1%	-	3	10%
Glass greenhouse	Floriculture	2	< 1%	-	2	7%
Glass greenhouse	Unknown	2	< 1%	-	2	6%
	Subtotal	7	< 1%	-	7	22%
Poly greenhouse	Unknown	8	< 1%	-	8	26%
Poly greenhouse	Nursery	8	< 1%	-	8	26%
Poly greenhouse	Floriculture	5	< 1%	< 1	5	17%
Poly greenhouse	Mixed	1	< 1%	-	1	4%
Poly greenhouse	Vegetables	< 1	< 1%	-	< 1	1%
Poly greenhouse	Unknown - Unmaintained	1	< 1%	-	1	4%
	Subtotal	24	< 1%	< 1	24	78%
	TOTAL	**31**	**< 1%**	**< 1**	**31**	**100%**

Table 13 shows that 31 hectares or < 1% of ALR land in Richmond is covered by greenhouses and crop barns.

Poly greenhouses make up 24 hectares of ALR land while glass greenhouses make up 7 hectares.

One crop barn housing bean sprouts was reported in Richmond. It comprises less than 1 hectare of ALR land.

Refer to Map B11 in Appendix B for more information.

Figure 20. Distribution of greenhouses by building type

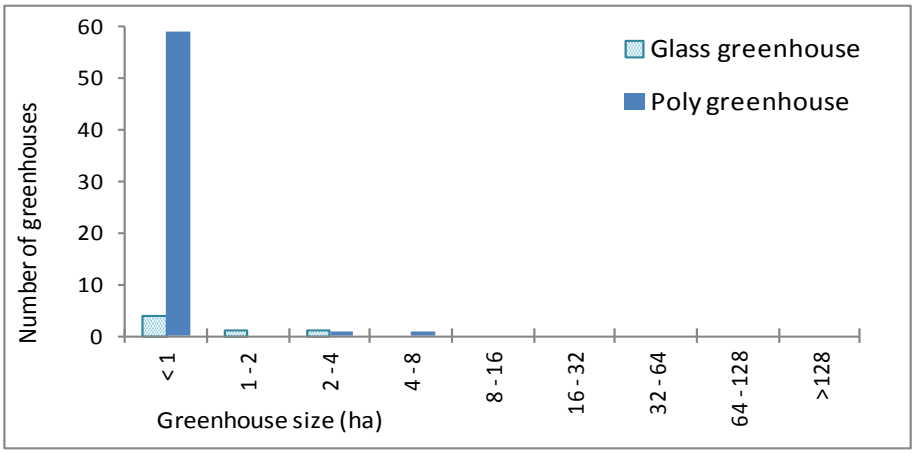


Figure 20 shows that there are significantly more poly (61) than glass (6) greenhouses in Richmond.

Refer to Table A5 in Appendix A for more information.

[11] Source: *Guide for Bylaw Development*, 1998 Issue (Working Copy) by Ministry of Agriculture and Food.

[12] The areas reported in this table exclude external yards, parking, warehouses and other infrastructure related to the greenhouse or crop barn operation. Poly refers to polyethylene.

Figure 21. Distribution of greenhouse total area by building type

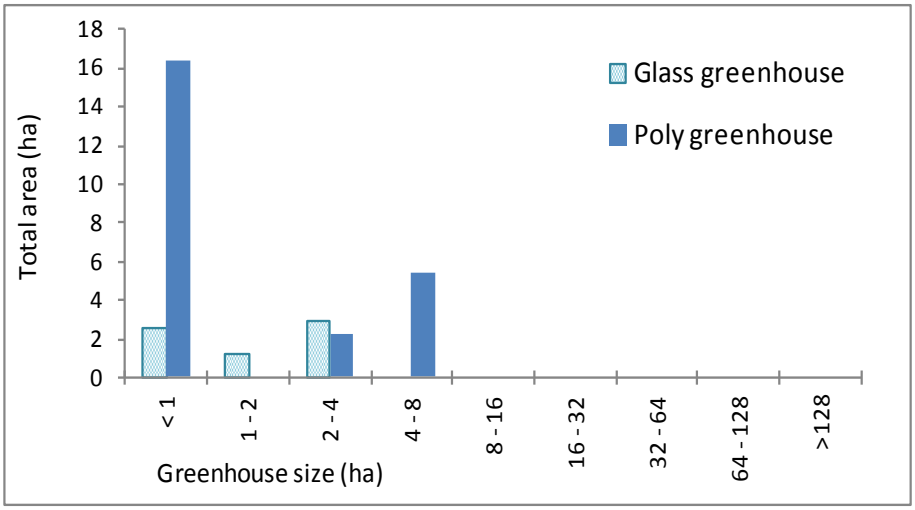


Figure 21 shows that poly greenhouses < 1 hectare in size comprise a total area of 16 hectares.

Refer to Table A5 in Appendix A for more information.

Figure 22. Distribution of greenhouses by crop type

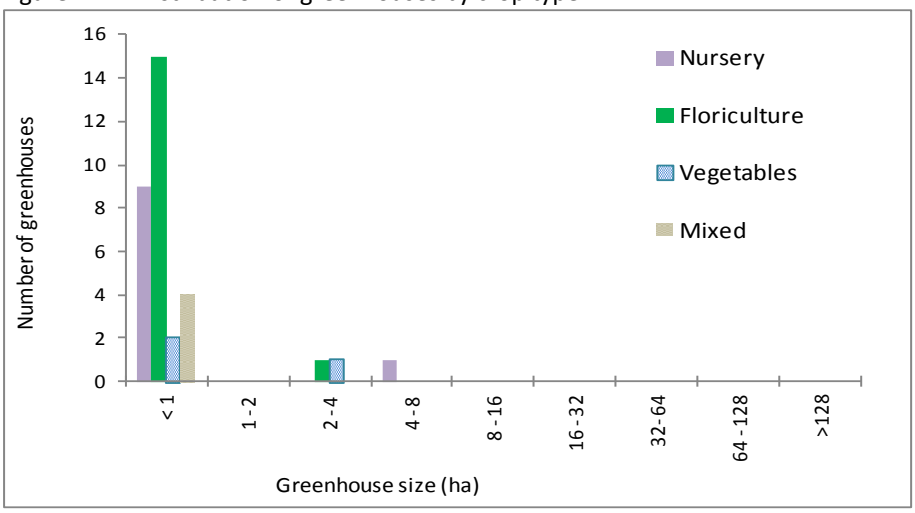


Figure 22 shows that all greenhouses in Richmond are less than 8 hectares and that greenhouses are most likely to be less than 1 hectare.

Floriculture comprises the most common greenhouse crop type, followed by nursery.

Refer to Table A6 in Appendix A for more information.

IRRIGATION

Irrigation is the artificial application of water to the land or soil and may be used to assist in the growing of agricultural crops, maintenance of managed vegetation, and control of soil erosion or dust. The potential to irrigate is often limited by the quality and quantity of available irrigation water. High salinity or microbial contamination renders water unsuitable for irrigation. Insufficient water sources or water delivery infrastructure limits the potential to increase agricultural production through irrigation.

Irrigation is captured at the field or land cover level by system type (sub-surface, sprinkler, giant gun, trickle) and then summarized by crop type to the total land area under irrigation. Irrigated land includes all irrigated field crops and may also include irrigated fallow farmland, land set temporarily set aside for wildlife or other purposes, and land under preparation for planting. Also included are crops grown in greenhouses and crop barns. In addition, the top 20 cultivated field crops are evaluated for percent of crop area under irrigation.

Table 14. Main crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)				Total area irrigated (ha)	% of crop area irrigated
	Sub-surface	Sprinkler	Giant gun	Trickle		
Berries	7	923	11	78	1,018	71%
Vegetables	30	250	27	4	312	56%
Forage, pasture	22	109	3	-	134	27%
Nursery, tree plantations	-	48	-	5	53	84%
Other*	7	4	-	-	11	19%
Turf	-	3	-	-	3	100%
Vines	-	-	-	3	3	89%
Tree fruits	-	3	-	-	3	40%
Floriculture	-	1	-	-	1	47%
TOTAL FIELD CROP AREA IRRIGATED	**66**	**1,341**	**41**	**89**	**1,538**	**59%**
Greenhouses & crop barns	Mix of flood and trickle irrigation				31	100%

* Other. Includes bare cultivated land, fallow land (cultivated land that has not been seeded or planted for one or more growing season), land in crop transition, and land planted in cover grass or under mulch to manage soil moisture/erosion associated with a cultivated crop.

Table 14 illustrates that 71% of all berry crops and 56% of all vegetable field crops are irrigated. Giant gun systems are reported only on berry, vegetable, and forage, pasture fields, while sprinkler systems are found on nearly all main crop types.

Refer to Map B12 in Appendix B for more information.

Figure 23. Irrigation systems by percentage of cultivated land

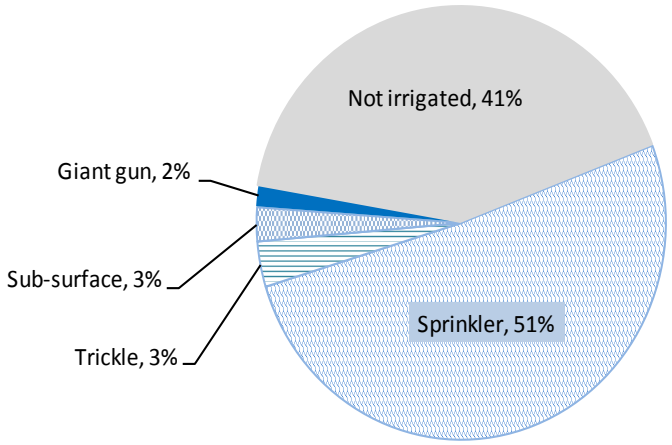


Figure 23 shows that sprinkler irrigation is the most widely used irrigation system in Richmond, occurring on 51% of all cultivated land, followed by trickle and sub-surface systems each at 3%.

Table 15. Top 20 field crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)				Total area irrigated (ha)	% crop area irrigated
	Sub-surface	Sprinkler	Giant gun	Trickle		
Cranberries	-	852	-	-	852	98
Blueberries	-	70	-	78	148	31
Mixed vegetables	3	152	15	4	174	58
Forage (managed)	19	83	3	-	105	39
Potatoes	18	43	5	-	65	51
Forage^	-	2	-	-	2	1
Strawberries	7	< 1	11	-	18	30
Sweet corn	-	28	-	-	28	49
Pasture (managed)	-	7	-	-	7	14
Nursery	-	44	-	-	44	97
Oats	-	-	-	-	-	-
Cole crops	3	19	-	-	22	81
Forage or pasture unknown	-	13	-	-	13	55
Crop transition	-	-	-	-	-	-
Pasture^	3	1	-	-	4	29
Cucurbits	6	2	1	-	9	62
Blueberries (Unmaintained)	-	-	-	-	-	-
Fallow land*	-	-	-	-	-	-
Cover grass	7	< 1	-	-	8	76
Cole crops (Unmaintained)	-	-	-	-	-	-
TOTAL	**66**	**1,317**	**35**	**82**	**1,499**	

^ Forage or pasture where the level of management could not be determined.

* Fallow land is cultivated land that has not been seeded or planted for one or more growing seasons.

Table 15 outlines the type of irrigation systems used on the top 20 field crops in Richmond. Sprinkler systems are the most commonly used irrigation system. Cranberries and nurseries in Richmond are irrigated entirely with sprinkler systems.

LIVESTOCK

Livestock activities are very difficult to measure using a windshield survey method. Livestock are often confined to structures making it difficult for the surveyor to see the animals. Local knowledge and other indicators such as animal confinement type (barn type), feeder system type, manure handling system type, and other visible elements may be used to infer the type of livestock and scale of activity that exist on a parcel. In addition, livestock are mobile and may utilize more than one land parcel. Livestock visible on a certain parcel one day may be visible on a different parcel the next day. This inventory does not attempt to identify animal movement between parcels that make up a farm unit but reports livestock at the parcel where the animals or related structures were observed.

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel. The "Main Type" of livestock does not represent the primary agricultural activity, but only the main type of livestock activity.

"Intensive" livestock activities utilize specialized structures such as barns, feedlots and stockyards designed for confined feeding at higher stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns and corrals/paddocks.

"Unknown livestock" refers to activities where non specialized livestock related structures were present but the livestock were not visible and therefore the specific type of livestock could not be determined.

The scale system used to describe livestock operations relies on animal unit equivalents which is a standard measure used to compare different livestock types. One animal unit equivalent is approximately equal to one adult cow or horse. The scale system includes 4 levels:

- "**Very Small**" Approximately 1 cow or horse or bison, 3 hogs, 5 goats or deer, 10 sheep, 50 turkeys, 100 chickens (1 animal unit equivalent)
- "**Small**" LESS THAN 25 cows or horses or bison, 75 hogs, 125 goats or deer, 250 sheep, 1,250 turkeys, 2,500 chickens (2 - 25 animal unit equivalents)
- "**Medium**" LESS THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1,000 sheep, 5,000 turkeys, 10,000 chickens (25 - 100 animal unit equivalents)
- "**Large**" MORE THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1,000 sheep, 5,000 turkeys, 10,000 chickens (over 100 animal unit equivalents).

Table 16. Livestock activities

Livestock group	Livestock detail *	By parcel		Total activities	By activity type	
		Main type	Secondary type		*Intensive*	*Non Intensive*
Beef	Beef total	4	1	5	-	*5*
Dairy	Dairy	4	-	4	*3*	*1*
	Dairy (Llama)	1	-	1	*1*	-
	Dairy total	5	-	5	4	1
Poultry	Chicken	8	-	8	2	6
	Turkey	2	-	2	2	-
	Chicken (Duck)	1	-	1	-	1
	Goose (Duck)	1	-	1	-	1
	Poultry total	12	-	12	4	8
Sheep / lamb / goat	Sheep / lamb	-	1	1	-	1
	Goat	1	1	2	-	2
	Goat (Llama)	-	1	1	-	1
	Sheep / lamb / goat total	1	3	4	-	4
Llama / alpaca	Llama / alpaca total	1	-	1	-	1
Inactive	Inactive total	1	-	1	1	-
Equine	Horse	29	2	31	-	*31*
	Donkey, ass	1	-	1	-	*1*
	Equine total	30	2	32	-	32
TOTAL		**54**	**6**	**60**	**9**	**51**

* When livestock type appears in parenthese (), it indicates the livestock activity is a mixed herd or flock.

Table 16 shows that equine is the most common type of livestock activity in Richmond, accounting for 32 of 60, or 53%, of all livestock activities. Poultry is the second most common with 12 activities or 20%.

There is one inactive operation (a former dairy), which despite not having cattle, continues to grow forage grass and oats.

Refer to Maps B13, B14, and B15 in Appendix B for more information.

Figure 24. Livestock activities (excluding equine) by scale and type

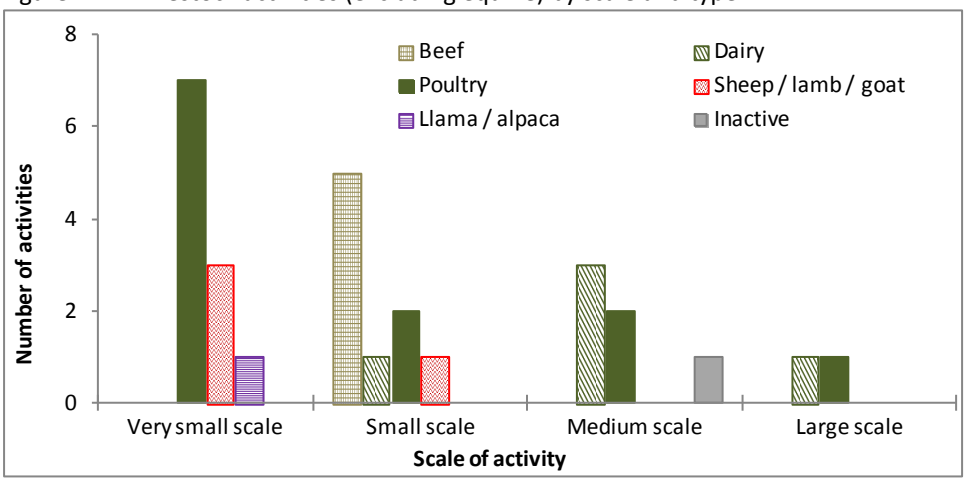


Figure 24 illustrates the scale of livestock activities (excluding equine) in Richmond.

Few livestock activities occur in Richmond and most of these are "small" or "very small" scale.

The only "large" scale livestock activities in Richmond are poultry and dairy which are both supply managed industries.

Refer to Tables A8, A10, A12, and A14 in Appendix A for more information.

Figure 25. Livestock and equine activities by scale

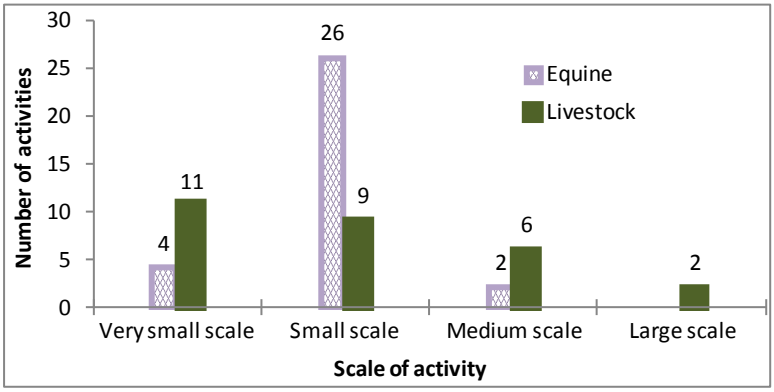


Figure 25 compares the scale of livestock activities with equine activities.

Even though 32 of the 60 livestock activities are equines, most are "small" scale. There are no "large" scale equine activities in Richmond while there are 2 "large" scale livestock activities.

Refer to Tables A8, A10, A12, A14 and A16 in Appendix A for more information.

Figure 26. Livestock activities (excluding equine) by parcel size and scale

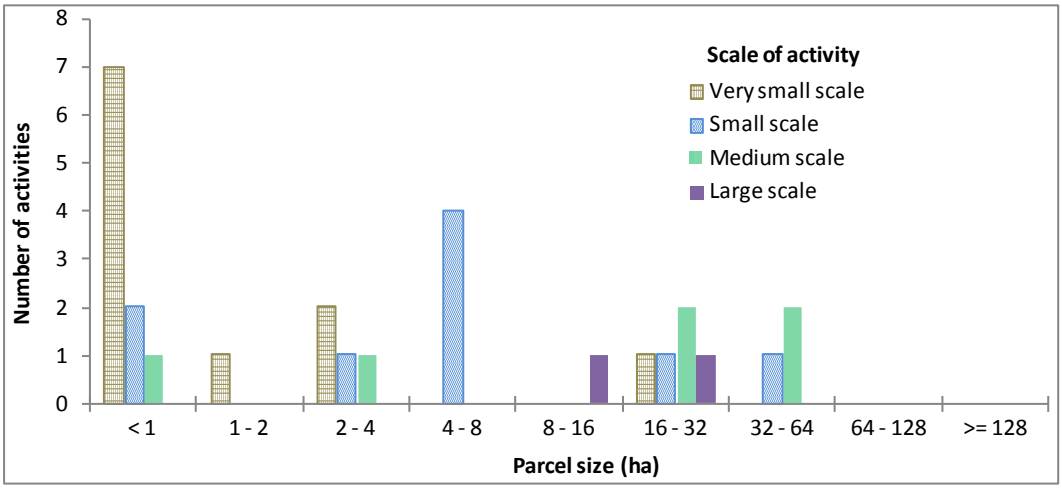


Figure 26 illustrates the distribution of livestock activities (excluding equine) by scale across parcel size categories. While all "large" scale livestock activities occur on larger parcels, there are also a few "very small" and "small scale" livestock activities that occur on larger parcels.

Refer to Tables A8, A10, A12, A14 and Figures A1, A3, A5, A7 in Appendix A for more information.

Figure 27. Livestock activities (excluding equines) by parcel size and type

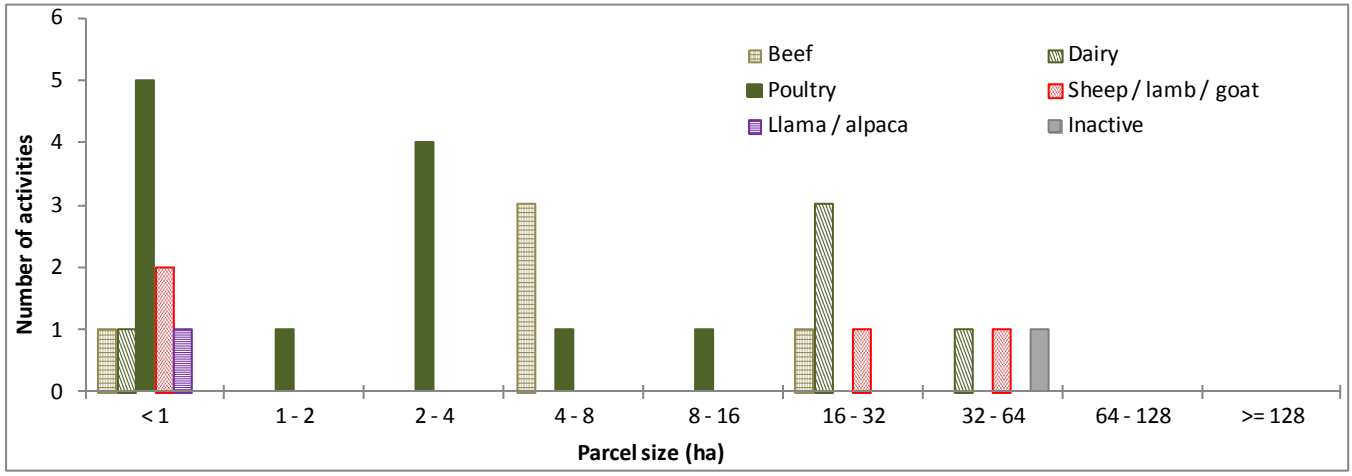


Figure 27 compares the distribution of different livestock types across parcel size categories. While most dairy activities occur on larger parcels, there is one occurrence of dairy cattle on a < 1 hectare parcel. Of the 12 poultry activities in Richmond, 10 occur on parcels less than 4 hectares.

Refer to Table A6 in Appendix A for more information.

Figure 28. Livestock and equine activities by parcel size

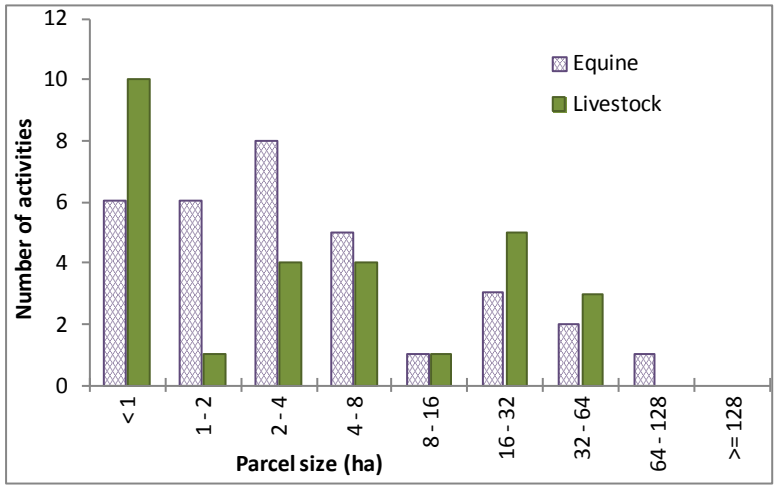


Figure 28 compares the distribution of equine and livestock across parcel size categories.

Both equine and livestock activities occur on all parcel sizes less than 64 hectares while equine is the only activity occurring on a parcel larger than 64 hectares.

Both livestock and equine activities occur on parcels < 1 hectare.

Refer to Table A6 in Appendix A for more information.

Figure 29. Average area in forage, pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

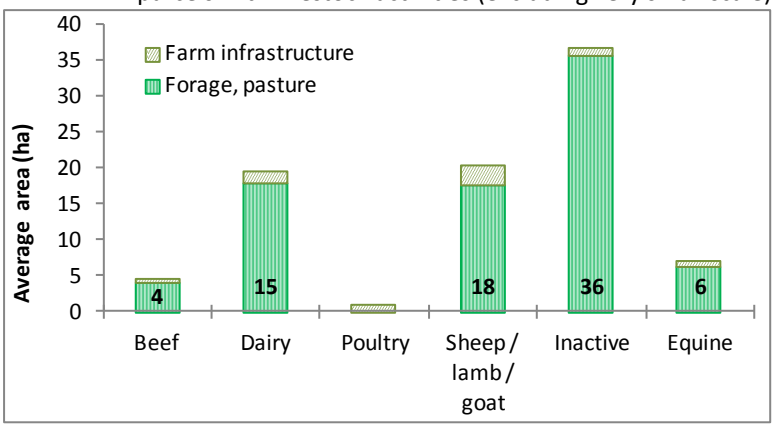
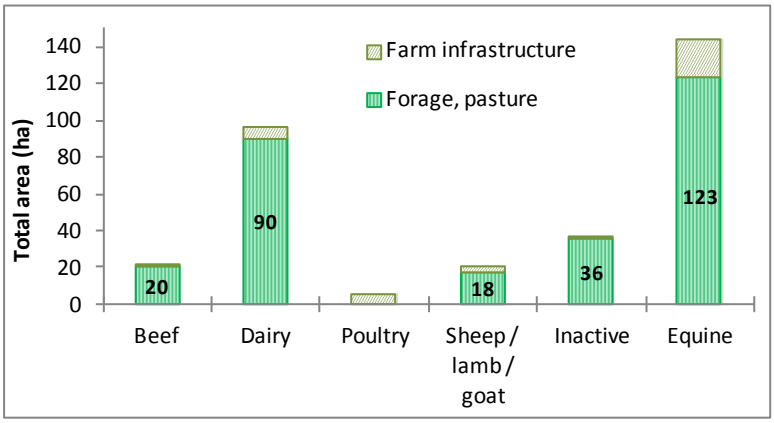


Figure 29 shows that on average, a sheep/lamb/goat activity is associated with 18 hectares of forage and pasture land, which is more than any other type of active livestock activity.

One inactive dairy operation is associated with 36 hectares of forage and pasture.

Figure 30. Total area in forage, pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)



Even though each dairy activity, on average, uses more forage and pasture than each equine activity (see Figure 29 above), Figure 30 shows that equine activities use more total area.

The actual forage area for dairy is often underestimated since not all dairy forage fields will be located on the same parcel as the livestock.

Refer to Figures A2, A4, A6, A8, and A10 in Appendix A for more information.

Figure 31. Percent of parcel area utilized for forage, pasture, and farm infrastructure on parcels with livestock activities (excluding very small scale)

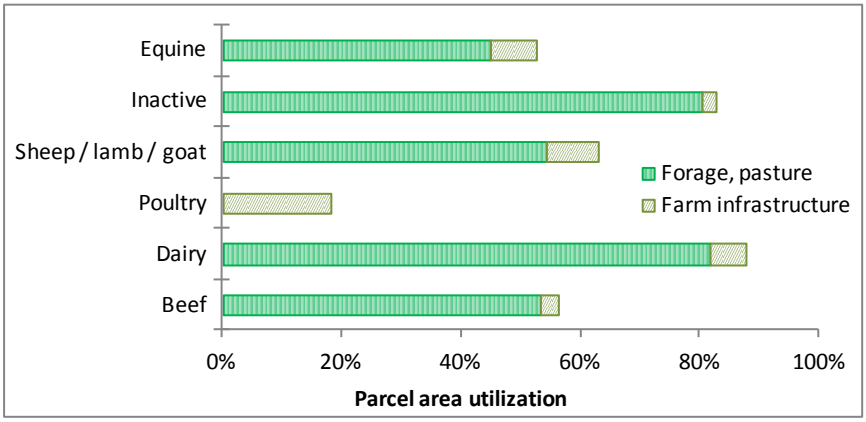
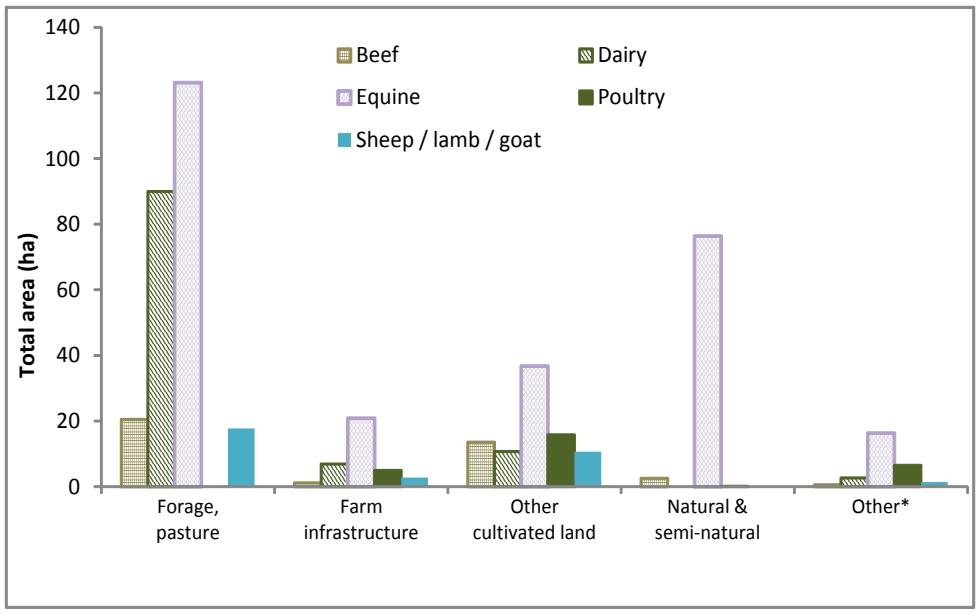


Figure 31 shows that on average, a dairy activity in Richmond utilizes 88% of its parcel area for forage, pasture and farm infrastructure while a poultry activity only utilizes 18%.

Figure 32. Land cover on parcels with livestock activities (excluding very small scale)



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

Figure 32 shows that the land cover associated with dairy activities is primarily forage and pasture. These operations are growing some of their own feed. Though equine activities are also growing some of their own feed, they are associated with a greater variety of land cover types. This indicates more mixed use parcels.

Refer to Figures A2, A4, A6, A8, and A10 in Appendix A

ON-FARM VALUE-ADDED

Activities which add value to raw commodities produced on the farm are reported in this section. At least 50% of the commodity utilized must be produced on farm[13] or the activity is considered non-agricultural. In many cases, local knowledge in combination with the field survey is used to determine if an activity meets the criteria to be considered on-farm value-added. The three main categories of value-added are: processing, direct sales, and agri-tourism.

Processing is an activity that maintains or raises the quality or alters the physical or chemical characteristics of a raw farm commodity, or adds value to it in any way. Processing includes grain mill or oilseed crushing, meat processing, wine or cider, kitchen / bakery, and canning. This category does not include crop washing and packaging.

Direct sales to the public occur through permanent stores, temporary stores such as fruit stands, U-pick, or restaurant / take out service located on the farm. Direct farm marketing sites are considered ambassadors of agriculture. Direct farm marketing engages the public's interest in food production and increases awareness of the benefits of local agriculture.

Agri-tourism promotes visits to the operation for the purpose of recreation, education or active involvement in the operation - a tourism experience. Agri-tourism must be in a farm setting and secondary to primary agricultural operation to be considered value-added. Included are corn mazes, petting zoos, bed & breakfasts, campsites, winery or orchard tours, guest ranches offering equestrian related activities, horse or donkey rental for trail riding / outfitting, and seasonal events such as farm festivals or pumpkin patches.

The scale system used to describe value-added activities reflects the human effort need to support the activity. The scale system includes 3 levels:

- "**Small**" scale represents a predominantly single household endeavour with management requiring less than one full time worker. Examples of small scale include a temporary roadside fruit stand, a small field u-pick, or egg sales from a backyard flock.
- "**Medium**" scale is sufficient to add value to on-farm products for sale to small local markets or serve a moderate number of people. Usually includes designated parking for customers and requires at least one full-time worker to manage. An example is 3-10 tourist accommodation spots.
- "**Large**" scale is intended to add value to large amounts of on-farm generated products or serve large numbers of people. Requires multiple workers to operate value-added component of farm operation. An example is more than 10 tourist accommodation spots.

[13] On-farm refers to the farm unit which includes all the property belonging to the farm and may incorporate more than one parcel.

Figure 33. Percentage of parcels "Used for farming" and with value-added activities

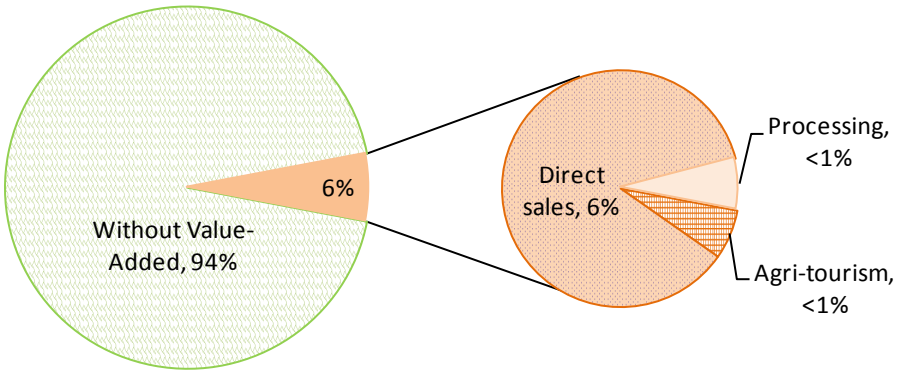
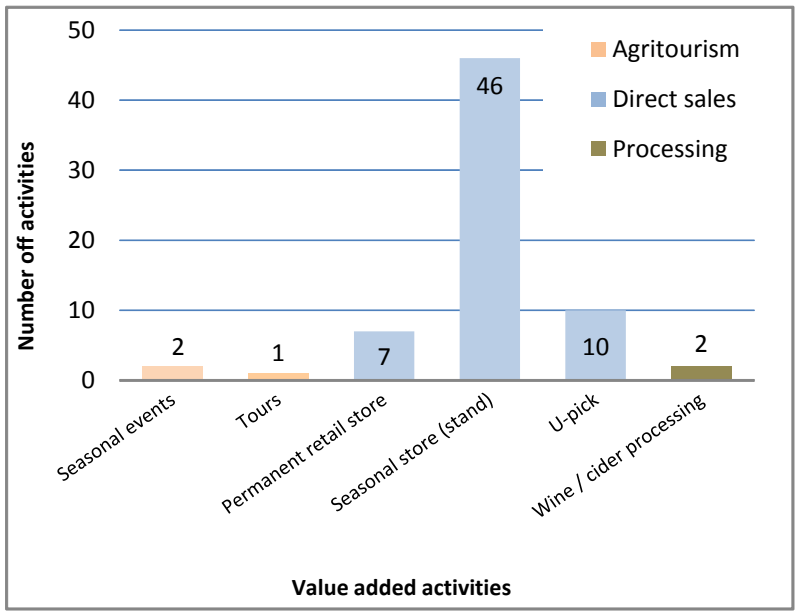


Figure 33. Only 52, or 6%, of all parcels "Used for farming" are also being used for value-added activities. Given the close proximity to a relatively large urban population, there are opportunities to increase activities such as agri-tourism and direct sales.

Figure 34. Number of parcels "Used for farming" with value-added activities



There are 68 value-added activities located on 52 parcels in Richmond.

Figure 34 shows that the majority of the value added activities are seasonal stores or stands.

Refer to Tables A18 through A22 in Appendix A for more information.

5. Condition of ALR Lands

This section presents a parcel based analysis of parcel size and residential uses in the ALR.

PARCEL INCLUSION IN THE ALR

The inventory area included 4,756 hectares of ALR on 2,093 parcels which is 91.8% of the ALR within Richmond. The remaining 8% of the ALR was excluded from the inventory as it is in parcels less than 100 square metres in size or outside surveyed land parcels in designated rights-of-way or foreshore.

ALR boundaries are not always coincident with parcel boundaries which results in many parcels having only a portion of their area in the ALR. To achieve an accurate picture of the ALR land in Richmond, only parcels that meet the following criteria are included in this section of the report:

- parcels > 0.05 hectares in size with at least half their area (>= 50%) in the ALR, or
- parcels with at least 10 hectares (>= 10 hectares) of ALR land.

In total, 2,079 parcels, with 4,747 hectares or 91.7% of Richmond's ALR land meet the above criteria and are included in the further analysis of the ALR.

Figure 35. Parcel inclusion in the ALR

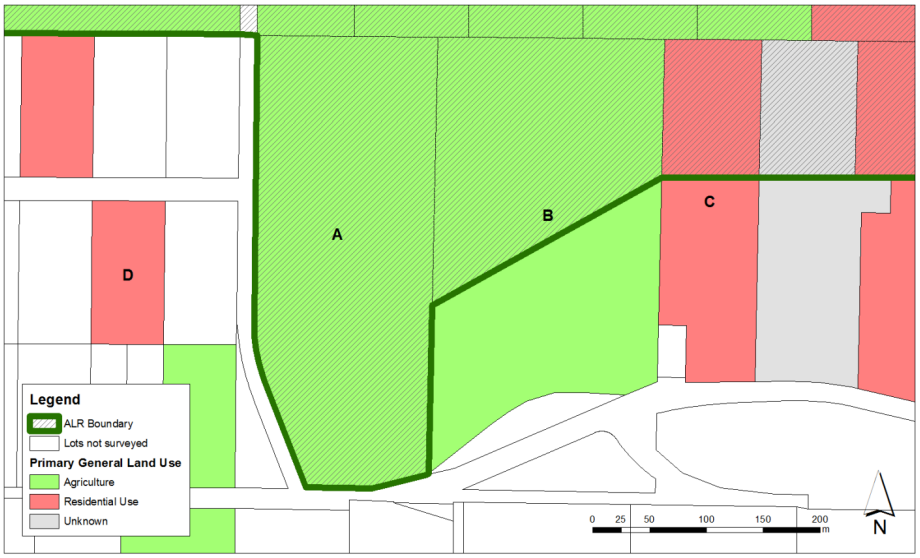


Figure 35 illustrates the distinction between parcels considered to be within or outside the ALR:

Considered to be within the ALR:

- *lot A is completely in the ALR*
- *lot B has 50% or more of its area in the ALR.*

Considered to be outside the ALR:

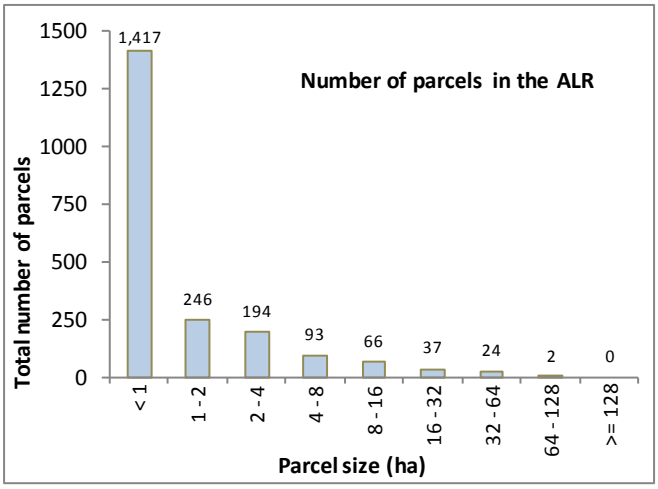
- *lot C has less than 50% of its area and less than 10 hectares in the ALR*
- *lot D is completely outside the ALR.*

PARCEL SIZE & FARMING IN THE ALR

Parcel size must be considered when determining the agricultural potential of a land parcel. Larger parcels usually allow farmers greater flexibility to expand or change their type of operation as the economy and markets change. Although some types of agriculture can be successful on small parcels, such as intensive organic market gardens, greenhouse operations and nurseries, generally the smaller the parcel is, the fewer viable options there are for farming.

A farming operation may utilize more than one parcel as a farm unit[14], however it is generally more efficient to run a farm on fewer larger parcels than many smaller parcels. Larger parcels accommodate equipment more efficiently and reduce the need to move farm equipment on public roads. Smaller parcels are more impacted by bylaws designed to reduce potential land use conflicts, such as setbacks from lot lines and road allowances, and may encourage alternative land uses such as residential.

Figure 36. Number of parcels in the ALR by parcel size



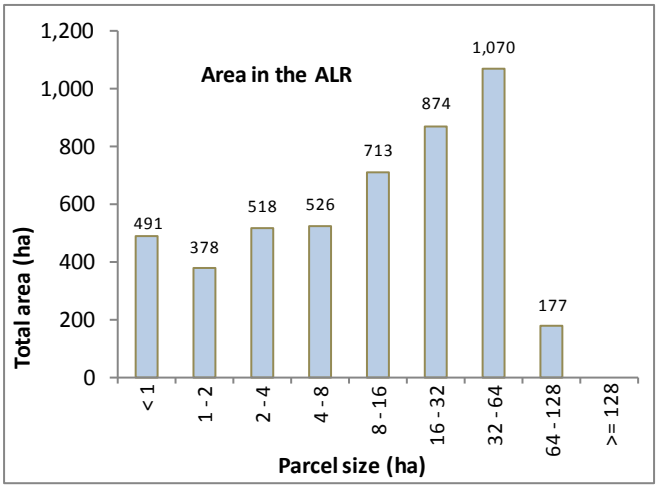
Approximately two thirds of Richmond's ALR parcels are less than one hectare. The average parcel size however is 2.3 hectares.

Figure 36 illustrates that of the 2,079 parcels in the ALR:

- *68% (1,417 parcels) are less than 1 hectare.*
- *89% (1,857 parcels) are less than 4 hectares.*
- *5% (93 parcels) are between 4 and 8 hectares.*
- *3% (66 parcels) are between 8 and 16 hectares.*
- *3% (63 parcels) are greater than 16 hectares.*

Refer to Map B16 in Appendix B for more information.

Figure 37. Total area in the ALR by parcel size



Even though Richmond is a metropolitan area and has a large number of small parcels, most of its ALR area is in larger parcels.

Figure 37 illustrates that of the 4,747 hectares in the ALR:

- *10% (491 hectares) is on parcels less than 1 hectare.*
- *29% (1,387 hectares) is on parcels less than 4 hectares.*
- *11% (526 hectares) is on parcels between 4 and 8 hectares.*
- *15% (713 hectares) is on parcels between 8 and 16 hectares.*
- *45% (2,121 hectares) is on parcels greater than 16 hectares.*

[14]Farm Unit – An area of land used for a farm operation consisting of one or more contiguous or non-contiguous parcels, that may be owned, rented or leased, which form and are managed as a single farm.

Table 17. Number of farmed and not farmed parcels in the ALR

Parcel status with respect to farming	Number of parcels	% of parcels in the ALR
Used for farming	962	46 %
Not used for farming	1,117	54 %
TOTAL	**2,079**	**100 %**

Table 17 demonstrates that of the 2,079 parcels in the ALR, 962 or 46% are "Used for farming".

Figure 38. Number of farmed and not farmed parcels in the ALR by parcel size

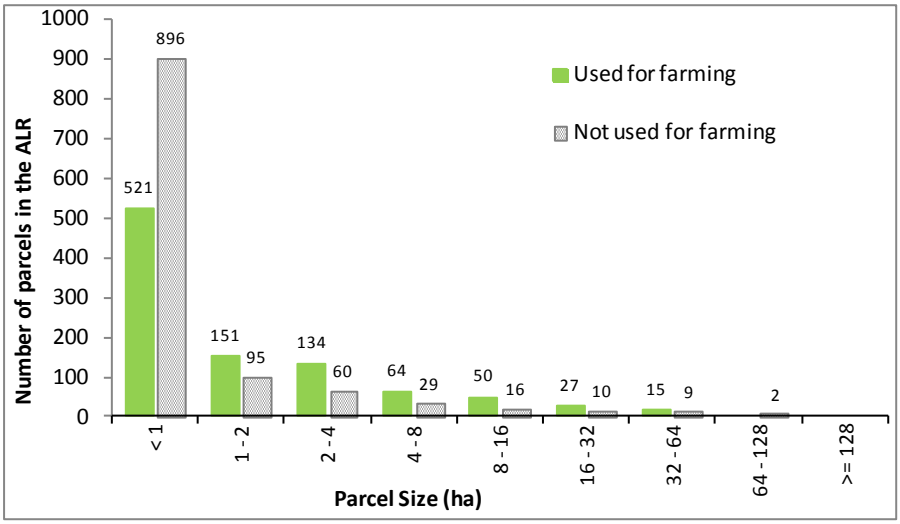


Figure 38 shows that of the 1,117 or 54% of parcels in the ALR and "Not used for farming", 896 or 80% are less than one hectare.

In parcel size categories greater than 1 hectare, the number of parcels "Used for farming" is generally greater than the number of parcels "Not used for farming".

Figure 39. Number of farmed and not farmed parcels in the ALR by parcel size (line chart)

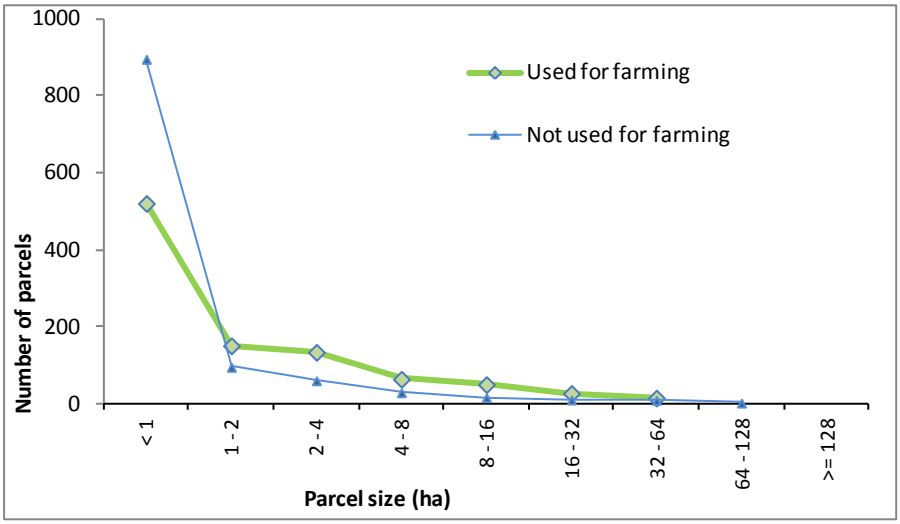


Figure 39 illustrates that although parcels of all sizes are "Used for farming", there are fewer small parcels farmed. The McLennan Area is highly parcelized and contributes to the large number of parcels that are less than 1 hectare and "Not used for farming".

Figure 40. Proportion of parcels farmed and not farmed by parcel size in the ALR

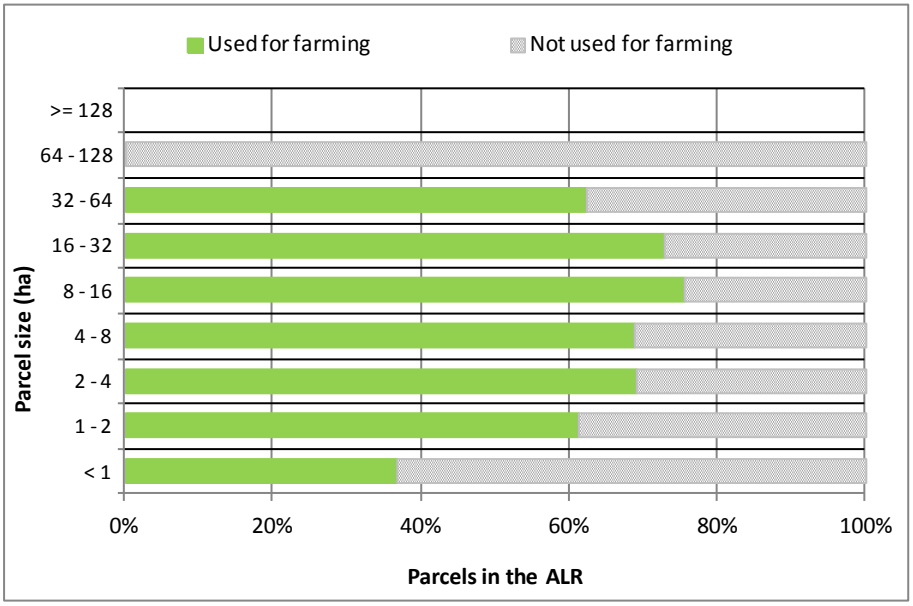
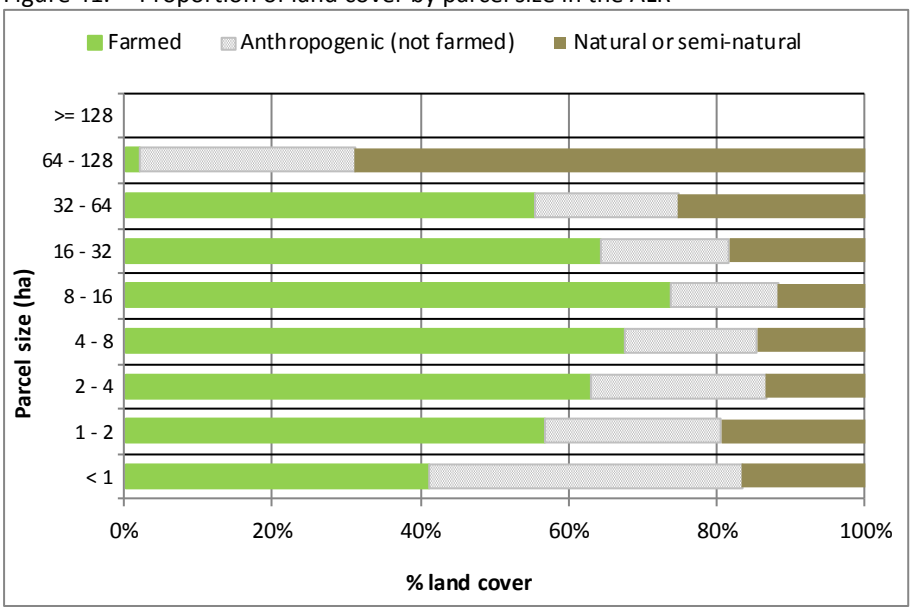


Figure 40 shows that in Richmond, the proportion of parcels being "Used for farming" is somewhat consistent across parcel size categories greater than 1 hectare.

Though over a third (37%) of all parcels less than 1 hectare are "Used for farming" parcels of this size are the least likely to be farmed.

There are two parcels in the 64-128 hectare category that are "Not used for Farming".

Figure 41. Proportion of land cover by parcel size in the ALR



Similar to Figure 40 above, Figure 41 shows that in Richmond, the proportion of farmed land cover remains somewhat consistent across parcel size categories except for parcels in categories less than 1 hectare and greater than 64 hectares.

RESIDENTIAL USE IN THE ALR

The ALR is a provincial zone in which agriculture is the priority use and some "Residential" use is considered a necessary accessory to the agricultural use of a property. However "Residential" use which is not an accessory to agriculture can effectively limit the ability of agriculture to grow, intensify and respond to market demands. When the primary motivation for ownership of ALR land is residential use, the residence is often placed to maximize privacy and views, with little consideration for agricultural opportunities on the parcel. Houses that are not adjacent to the frontage road alienate portions of land from future agriculture. If the occupants are non-farmers, they are more likely to be affected by noise or odour from neighbouring farm operations.

The size of the residence may be another factor to consider. Properties with larger residences have higher property values making it unrealistic for a farmer to acquire and convert this land to farmland in the future.

Average land improvement values of Richmond properties with residences in the ALR were as follows:

- *estate single family house $942,528*
- *large single family house $433,467*
- *medium single family house $162,530*
- *small single family house $82,344*
- *single mobile home $53,820*

(Calculated using 2011 BC Assessment database - Last improvement value)

In the following analysis cabins/cottages, mobile homes, single-family houses, duplexes, townhouses, apartments, dormitories, and institutional living buildings are included. Single-family houses are further described by estimated size of the building:

- Small single-family house <1,500 sq. ft.
- Medium single-family house 1,500 – 3,500 sq. ft.
- Large single-family house 3,500 – 5,000 sq. ft.
- Estate (very large) single-family house > 5,000 sq. ft.

Residential footprint includes the main residence plus its associated yard, driveway, parking and any auxiliary buildings or structures. When two residences are on a property, areas associated to both (such as shared driveways, parking or yard), are assigned to the closest residence.

Table 18. Farming and residences in the ALR

Parcel status	With residence		Without residence		Total number of parcels
	Number of parcels	% of parcels	Number of parcels	% of parcels	
Used for farming	349	17%	613	29%	962
Not used for farming but available	273	13%	291	14%	564
Not used for farming and unavailable	446	21%	107	5%	553
TOTAL	**1,068**	**51%**	**1,011**	**49%**	**2,079**

Table 18 shows that 1,068 parcels or 51% of ALR parcels have residences and 719 of these parcels are "Not used for farming".

Table 19. Farming and residence type in the ALR

Parcel status	Residences *							Total residences	Total number of parcels
	Single mobile home	Small house	Medium house	Large house	Estate house	Duplex	Townhouse		
Used for farming	4 (4)	156 (138)	131 (120)	63 (60)	27 (27)	-	-	381	349
Not used for farming but available	3 (2)	118 (110)	98 (96)	38 (38)	27 (27)	-	-	284	273
Not used for farming and unavailable	-	149 (142)	194 (193)	77 (77)	32 (32)	1 (1)	1 (1)	454	446
TOTAL RESIDENCES	**7**	**423**	**423**	**178**	**86**	**1**	**1**	**1,119**	
TOTAL PARCELS	**6**	**390**	**409**	**175**	**86**	**1**	**1**		**1,068**

* xx (yy) - xx indicates the number of residences and (yy) indicates the number of parcels where the residence type is the largest on the parcel.

Table 19 demonstrates that there are 1,068 parcels in the ALR with 1,119 residences (some parcels have more than one residence). Most residences are small (<1,500 sq. ft) or medium houses (1,500 – 3,500 sq. ft). Nearly two thirds (66%) of all large (3,500 – 5,000 sq. ft.) and estate houses (> 5,000 sq. ft.) are on parcels "Not used for farming".

Figure 42. Total area in residential footprint by parcel size

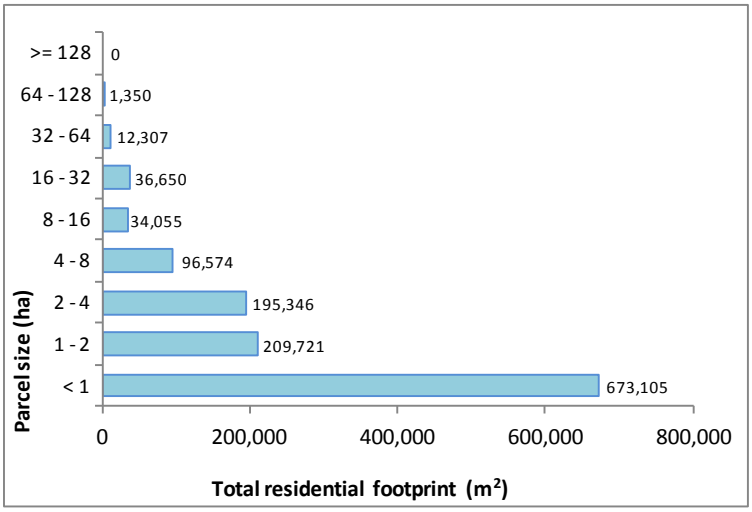


Figure 42 illustrates that there are nearly 126 hectares (1,259,107 m^2) of ALR land in residential footprints distributed across all parcel sizes less than 128 hectares.

Over half of the total residential footprint area is on parcels less than 1 hectare in size.

Figure 43. Proportion of parcels with residences by parcel size

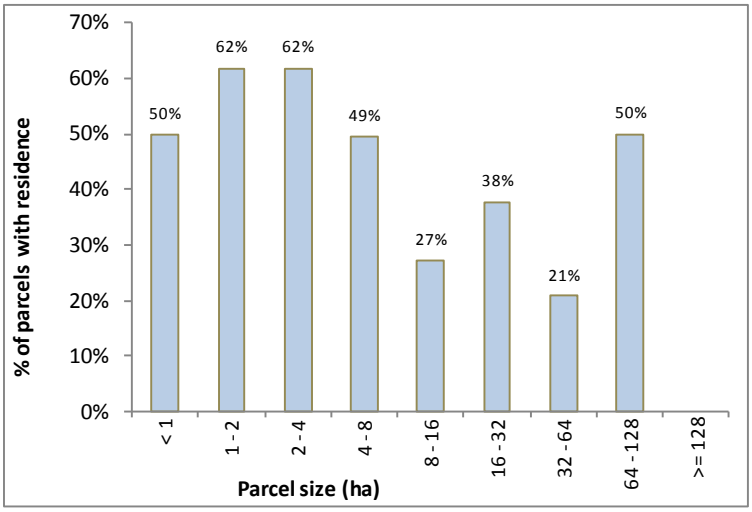


Figure 43 shows that while there are 1,417 parcels in the ALR less than 1 hectare (see Figure 36), only 50% of them have residences.

Figure 44. Average percent of parcel area in residential footprint by parcel size

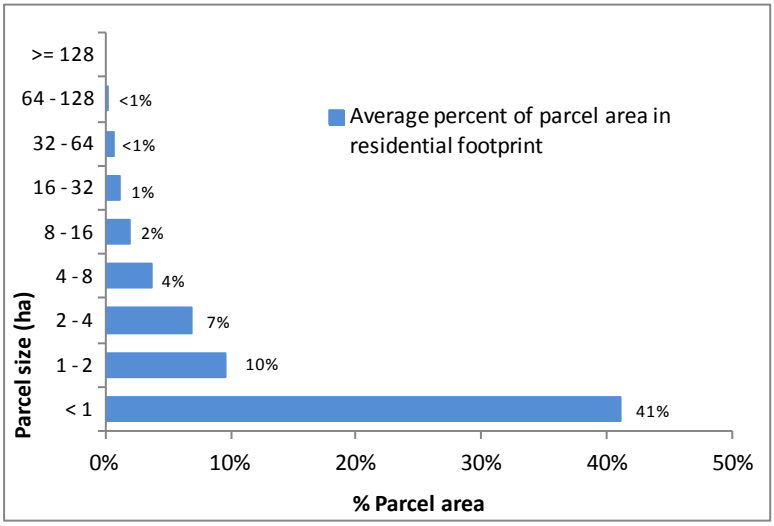


Figure 44 demonstrates that residential footprints on smaller parcels use a much greater proportion of the parcel area than those on larger parcels.

Figure 45. Average total area in residential footprint by parcel size

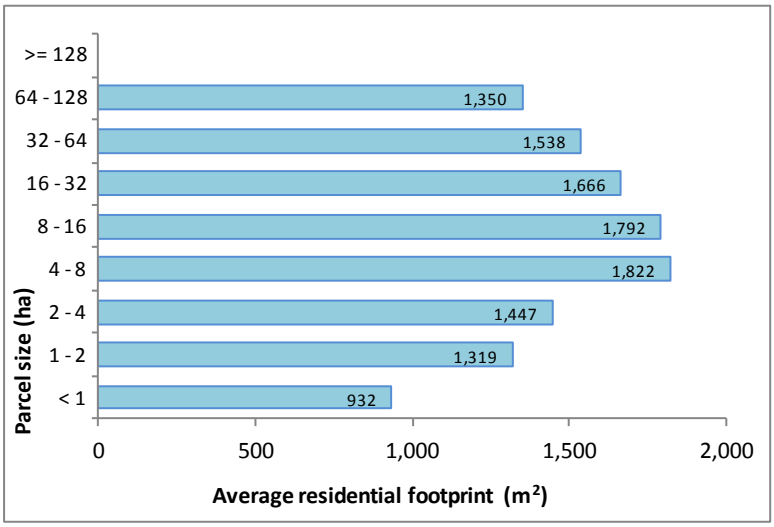
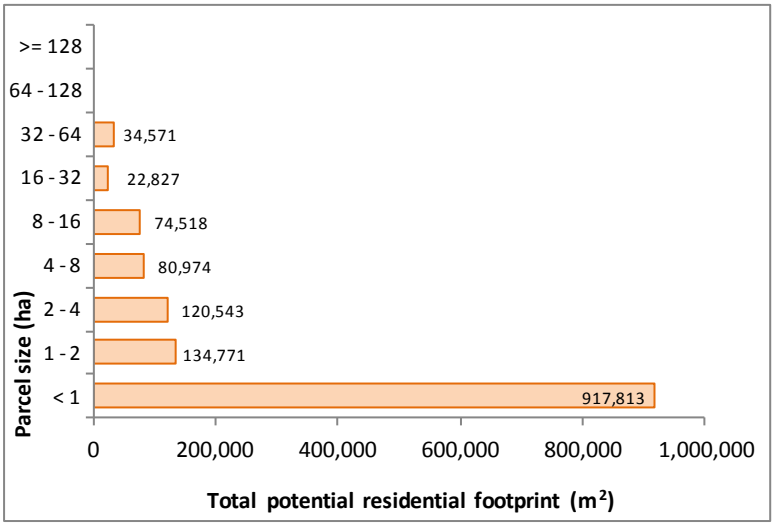


Figure 45 illustrates that even though residential footprints on small parcels use a greater proportion of the parcel area, the average size of the footprint is smaller compared to the footprint on larger parcels.

Figure 46. Total and potential area in residential footprint by parcel size



There are 904 parcels in the ALR that are "Used for farming" or "Not used for farming but available" that do not yet have a residence (Refer to Table 18).

If all 904 parcels built a residence, using the average percent of parcel area in residential footprint presented above, Figure 46 shows that an additional 138 hectares (1,386,018 m²) of ALR land would be permanently removed from potential production.

Table 20. Main agriculture activity and largest residence on parcels "Used for farming" in the ALR

Main agricultural activity	Largest residence on the parcel					Number of parcels
	Single mobile home	Small house	Medium house	Large house	Estate house	
Berries	3	68	65	29	17	182
Vegetables	1	31	19	16	6	73
Forage, pasture	-	11	8	1	2	22
Equine	-	7	9	3	1	20
Poly greenhouse	-	8	1	2	-	11
Other	-	3	6	2	-	11
Nursery, tree plantations	-	-	6	2	-	8
Glass greenhouse	-	3	-	2	-	5
Dairy	-	3	1	1	-	5
Poultry	-	2	1	1	-	4
Cereals	-	1	1	-	1	3
Tree fruits	-	-	2	-	-	2
Nut trees	-	-	-	1	-	1
Llama / alpaca	-	1	-	-	-	1
Farm	-	-	1	-	-	1
TOTAL PARCELS	**4**	**138**	**120**	**60**	**27**	**349**

There are 349 parcels in Richmond with residences that are "Used for farming" (refer to Table 19).

Table 20 shows that large or estate houses occur most frequently on parcels with berries as the main agricultural activity.

Table 21. Main agriculture activity on "Used for farming" parcels with large or estate residences in the ALR

Main agricultural activity	Parcels with "Large" or "Estate" residences			
	Number of parcels	Crop area utilized (ha)	Average % of parcel area in crop	Average parcel area (ha)
Berries	46	107	77 %	3
Vegetables	22	73	75 %	4
Equine	4	9	41 %	4
Forage, pasture	3	11	70 %	5
Poly greenhouse	2	0	51 %	0
Other	2	3	67 %	2
Nursery, tree plantations	2	2	70 %	2
Glass greenhouse	2	5	73 %	3
Poultry	1	11	73 %	15
Nut trees	1	1	74 %	1
Grains, cereals	1	7	91 %	8
Dairy	1	28	87 %	33
TOTAL	**87**	**258**		

Table 21 illustrates that there are 87 parcels with large or estate residences in the ALR that are "Used for farming". Of these parcels, 46 or 53% are associated with 107 hectares of berry production.

Appendix A

CULTIVATED FIELD CROPS

Table A1. Distribution of crop field sizes for all cultivated land

Crop Area (ha)	Number of crop fields											Total Number
	Berries	Vegetables	Forage, pasture	Nursery, tree plantations	Other*	Cereals	Tree fruits	Turf	Vines	Floriculture	Nut trees	
< 1	546	61	37	18	18	2	8	1	2	2	1	696
1 - 2	121	34	11	10	4	2	1	-	1	1	-	185
2 - 4	54	26	17	3	4	2	1	1	-	-	-	108
4 - 8	28	16	9	3	3	4	-	-	-	-	-	63
8 - 16	31	12	5	1	-	-	-	-	-	-	-	49
16 - 32	8	6	9	-	1	-	-	-	-	-	-	24
32 - 64	4	1	2	-	-	-	-	-	-	-	-	7
64 - 128	-	-	-	-	-	-	-	-	-	-	-	-
>= 128												
TOTAL FIELD COUNT	**792**	**156**	**90**	**35**	**30**	**10**	**10**	**2**	**3**	**3**	**1**	**1,132**
AVERAGE CROP AREA (ha)	**2 ha**	**4 ha**	**5 ha**	**2 ha**	**2 ha**	**4 ha**	**< 1 ha**	**2 ha**	**1 ha**	**< 1 ha**	**< 1 ha**	**2 ha**
MEDIAN CROP AREA (ha)	**< 1 ha**	**1 ha**	**2 ha**	**< 1 ha**	**< 1 ha**	**3 ha**	**< 1 ha**	**2 ha**	**< 1 ha**	**< 1 ha**	**< 1 ha**	**< 1 ha**
AVERAGE PARCEL SIZE (ha)	**2 ha**	**6 ha**	**11 ha**	**5 ha**	**7 ha**	**12 ha**	**4 ha**	**18 ha**	**2 ha**	**1 ha**	**4 ha**	**3 ha**

* Other. Includes bare cultivated land, fallow land (cultivated land that has not been seeded or planted for one or more growing season), land in crop transition, and land planted in cover grass or under mulch to manage soil moisture/erosion associated with a cultivated crop.

Table A2. Distribution of berry field sizes

Field size (ha)	Number of berry fields				Total number
	Cranberries	Blueberries	Strawberries	Raspberries	
< 1	271	268	4	4	547
1 - 2	27	93	-	1	121
2 - 4	28	23	3	-	54
4 - 8	15	10	2	1	28
8 - 16	25	6	2	-	33
16 - 32	6	-	1	-	7
32 - 64	3	1	-	-	4
64 - 128	-	-	-	-	-
TOTAL COUNT	**375**	**401**	**12**	**6**	***794***
AVERAGE CROP AREA (ha)	**2 ha**	**1 ha**	**5 ha**	**1 ha**	**2 ha**
MEDIAN CROP AREA (ha)	**< 1 ha**	**< 1 ha**	**3 ha**	**< 1 ha**	**< 1 ha**
AVERAGE PARCEL SIZE (ha)	**3 ha**	**2 ha**	**13 ha**	**8 ha**	**2 ha**

Table A3. Distribution of vegetable field sizes

Field size (ha)	Number of vegetable fields										Total number
	Mixed vegetables	Potatoes	Sweet corn	Cole crops	Cucurbits	Pumpkins	Beans	Peas	Leafy vegetables	Unknown	
< 1	47	7	3	-	5	1	1	2	-	4	70
1 - 2	26	9	3	2	4	1	1	2	2	1	51
2 - 4	15	7	3	2	-	1	-	-	-	-	28
4 - 8	10	6	4	1	1	1	1	-	-	-	24
8 - 16	6	4	-	2	-	-	-	-	-	-	12
16 - 32	3	1	1	-	-	-	-	-	-	-	5
32 - 64	-	-	-	-	-	-	-	-	-	-	-
64 - 128	-	-	-	-	-	-	-	-	-	-	-
>128	-	-	-	-	-	-	-	-	-	-	-
TOT. COUNT	**107**	**34**	**14**	**7**	**10**	**4**	**3**	**4**	**2**	**5**	**190**
AVG. CROP AREA (ha)	**3 ha**	**4 ha**	**4 ha**	**5 ha**	**2 ha**	**2 ha**	**2 ha**	**< 1 ha**	**2 ha**	**< 1 ha**	**3 ha**
MEDIAN CROP AREA (ha)	**1 ha**	**3 ha**	**3 ha**	**4 ha**	**1 ha**	**2 ha**	**2 ha**	**< 1 ha**	**2 ha**	**< 1 ha**	**1 ha**
AVG. PARCEL SIZE (ha)	**6 ha**	**11 ha**	**12 ha**	**14 ha**	**13 ha**	**6 ha**	**4 ha**	**13 ha**	**12 ha**	**10 ha**	**6 ha**

Table A4. Distribution of forage & pasture fields

Field size (ha)	Number of forage & pasture fields				Total number
	Forage	Pasture	Forage & pasture	Unmaintained*	
< 1	23	15	1	1	40
1 - 2	9	6	-	-	15
2 - 4	14	3	1	1	19
4 - 8	10	3	-	-	13
8 - 16	10	2	-	-	12
16 - 32	8	-	-	-	8
32 - 64	-	-	-	-	-
64 - 128	-	-	-	-	-
>128	-	-	-	-	-
TOTAL FIELD COUNT	**74**	**29**	**2**	**2**	***107***
AVERAGE CROP AREA (ha)	**6 ha**	**2 ha**	**2 ha**	**2 ha**	**5 ha**
MEDIAN CROP AREA (ha)	**3 ha**	**< 1 ha**	**2 ha**	**2 ha**	**2 ha**
AVERAGE PARCEL SIZE (ha)	**13 ha**	**10 ha**	**37 ha**	**27 ha**	**11 ha**

* Unmaintained forage/pasture refers to forage or pasture which would probably not warrant harvest.

** Unused forage/pasture refers to forage or pasture which has not been cut or grazed during the current growing season.

GREENHOUSES & CROP BARNS

Table A5. Distribution of greenhouses and crop barns by building type[1]

Greenhouse / crop barn size (ha)	Number of greenhouses / crop barns			Total number
	Glass greenhouse	Poly greenhouse	Crop Barn	
< 1	4	59	1	64
1 - 2	1	-	-	1
2 - 4	1	1	-	2
4 - 8	-	1	-	1
8 - 16				
16 - 32	-	-	-	-
32 - 64				
64 - 128				
>128				
TOTAL COUNT	**6**	**61**	**1**	***68***
AVERAGE AREA (ha)	**1 ha**	**< 1 ha**	**< 1 ha**	***< 1 ha***
MEDIAN AREA (ha)	**< 1 ha**	**< 1 ha**	**< 1 ha**	**< 1 ha**
AVERAGE PARCEL SIZE (ha)	**2 ha**	**4 ha**	**< 1 ha**	***4 ha***

Table A6. Distribution of greenhouses and crop barns by crop type[2]

Greenhouse / crop barn size (ha)	Number of greenhouses / crop barns						Total number
	Vegetables	Nursery	Floriculture	Mixed	Unknown	Bean sprouts	
< 1	2	9	15	4	36	1	67
1 - 2	-	-	-	-	1		1
2 - 4	1	-	1	-	-		2
4 - 8	-	1	-	-	-		1
8 - 16	-	-	-	-	-		-
16 - 32	-	-	-	-	-		-
32- 64	-	-	-	-	-		-
64 - 128	-	-	-	-	-		-
>128	-	-	-	-	-		-
TOTAL COUNT	**3**	**10**	**16**	**4**	**37**	**1**	**71**
AVERAGE AREA (ha)	**1 ha**	**< 1 ha**	**< 1 ha**	***< 1 ha***	**< 1 ha**	**< 1 ha**	***< 1 ha***
MEDIAN AREA (ha)	**< 1 ha**	**< 1 ha**	**< 1 ha**	***< 1 ha***	**< 1 ha**	**< 1 ha**	***< 1 ha***
AVERAGE PARCEL SIZE (ha)	**3 ha**	**9 ha**	**2 ha**	***2 ha***	**3 ha**	**< 1 ha**	***4 ha***

[1] The average area and median area reported in this table excludes external yards, parking, warehouses and other infrastructure related to the greenhouse or crop barn operation.

[2] Each distinct greenhouse or crop barn type one on parcel is counted as one activity. Each activity will include one and perhaps more greenhouse or crop barn structures. A parcel may have more than one activity if there is more than one distinct type of activity on that parcel.

Table A7. Distribution of livestock operations by type

Parcel size (ha)	Type of activity							Total number of activities
	Beef	Dairy	Poultry	Sheep / lamb / goat	Llama / alpaca	Equine	Inactive	
< 1	1	1	5	2	1	6	-	16
1 - 2	-	-	1	-	-	6	-	7
2 - 4	-	-	4	-	-	8	-	12
4 - 8	3	-	1	-	-	5	-	9
8 - 16	-	-	1	-	-	1	-	2
16 - 32	1	3	-	1	-	3	-	8
32 - 64	-	1	-	1	-	2	1	5
64 - 128	-	-	-	-	-	1	-	1
>= 128	-	-	-	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	**5**	**5**	**12**	**4**	**1**	**32**	**1**	**60**
MEDIAN PARCEL SIZE (ha)	**4 ha**	**30 ha**	**2 ha**	**16 ha**	**1 ha**	**2 ha**	**44 ha**	**2 ha**
AVERAGE PARCEL SIZE (ha)	**8 ha**	**22 ha**	**3 ha**	**16 ha**	**1 ha**	**10 ha**	**44 ha**	**9 ha**

Table A8. Beef activities

Scale of beef activity	By parcel		Total number of activities	*By activity type*	
	Main type	Secondary type		*Intensive*	*Non Intensive*
Small scale (2-25 cattle)	4	1	5	-	*5*
TOTAL	**4**	**1**	**5**	**-**	***5***

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel and does not represent primary agricultural activity.

"Intensive" livestock activities utilize specialized structures such as barns, feedlots and stockyards designed for confined feeding at high stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns and corrals/paddocks.

Table A9. Distribution of beef activities by parcel size and scale

Parcel size (ha)	Scale of beef activities				Total number of activities
	Very small (1 cow)	Small (2-25 cattle)	Medium (25-100 cattle)	Large (> 100 cattle)	
< 1	-	1	-	-	1
1 - 2	-	-	-	-	-
2 - 4	-	-	-	-	-
4 - 8	-	3	-	-	3
8 - 16	-	-	-	-	-
16 - 32	-	1	-	-	1
32 - 64	-	-	-	-	-
64 - 128	-	-	-	-	-
>= 128					
TOTAL NUMBER OF ACTIVITIES	**-**	**5**	**-**	**-**	**5**
AVERAGE PARCEL SIZE (ha)	**-**	**8 ha**	**-**	**-**	**10 ha**

Figure A1. Distribution of beef activities by parcel size and scale

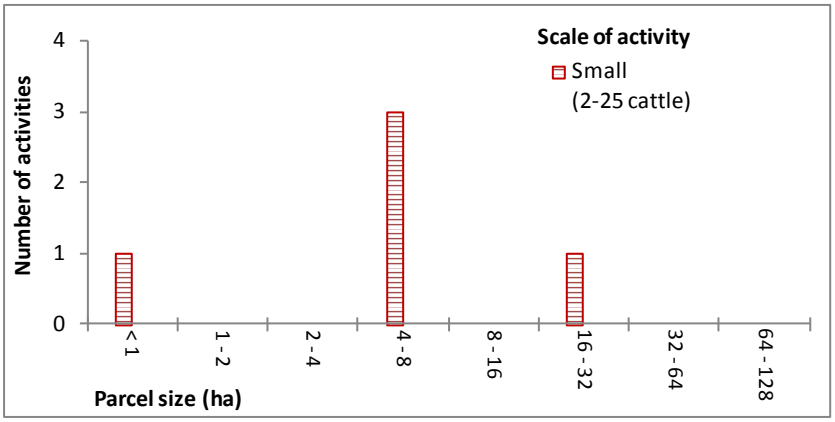
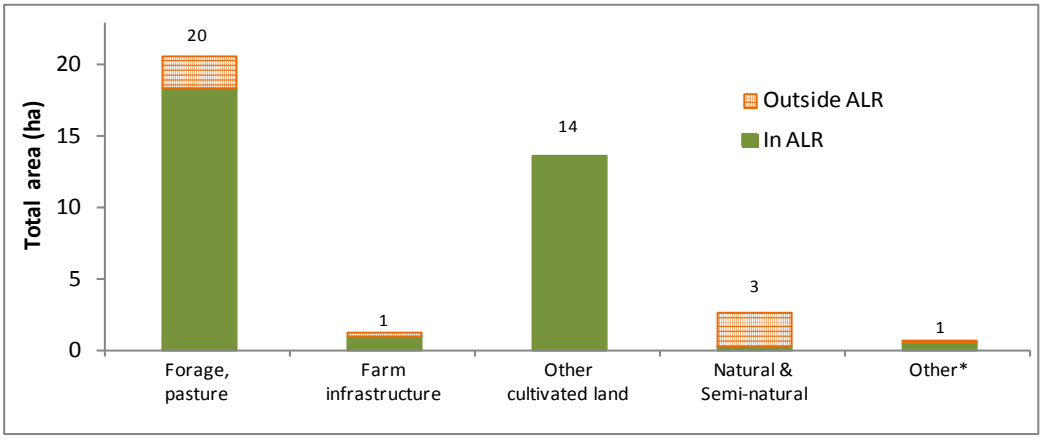


Figure A2. Land cover on parcels with beef activities



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

Table A10. Dairy activities

Scale of dairy activity	By parcel		Total number of activities	*By activity type*	
	Main type	Secondary type		*Intensive*	*Non intensive*
Small scale (2-25 cattle)	1	-	1	-	*1*
Medium scale (25-100 cattle)	3	-	3	*3*	-
Large scale (> 100 cattle)	1	-	1	*1*	-
TOTAL	**5**	**-**	**5**	***4***	***1***

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel and does not represent primary agricultural activity.

"Intensive" livestock activities utilize specialized structures such as barns, feedlots and stockyards designed for confined feeding at high stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns and corrals/paddocks.

Table A11. Distribution of dairy activities by parcel size and scale

Parcel Size (ha)	Scale of dairy activities				Total number of activities
	Very small (1 cow)	Small (2-25 cattle)	Medium (25-100 cattle)	Large (> 100 cattle)	
< 1	-	1	-	-	1
1 - 2	-	-	-	-	-
2 - 4	-	-	-	-	-
4 - 8	-	-	-	-	-
8 - 16	-	-	-	-	-
16 - 32	-	-	2	1	3
32 - 64	-	-	1	-	1
64 - 128	-	-	-	-	-
>= 128					
TOTAL NUMBER OF ACTIVITIES	**-**	**1**	**3**	**1**	***5***
AVERAGE PARCEL SIZE (ha)	**-**	**1 ha**	**31 ha**	**16 ha**	***22 ha***

Figure A3. Distribution of dairy activities by parcel size and scale

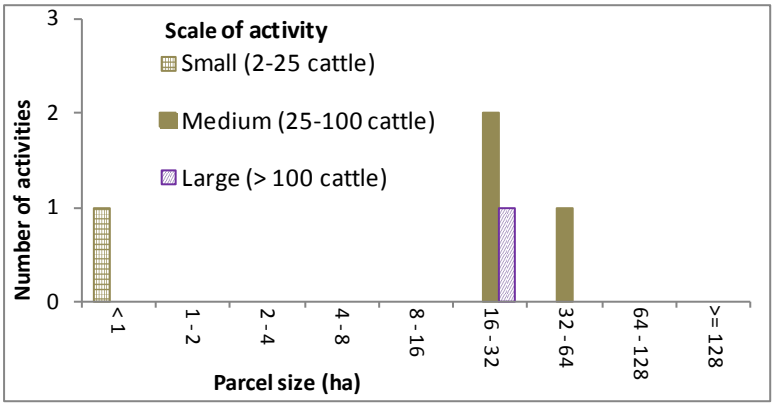
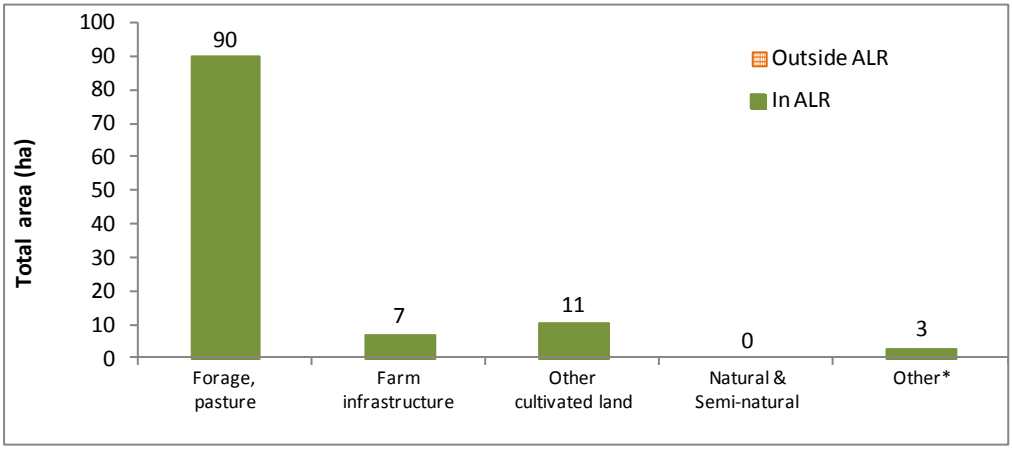


Figure A4. Land cover on parcels with dairy activities



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

Table A12. Poultry activities

Poultry activity	Scale	By parcel		Total number of activities	*By activity type*	
		Main type	Secondary type		*Intensive*	*Non intensive*
Chicken	Very small scale (< 100 birds)	6		6	-	*6*
Chicken	Small scale (100 -2,500 birds)	1		1	*1*	-
Chicken	Medium scale (2500 - 10,000 birds)	1		1	-	*1*
Chicken (broiler)	Large scale (> 10,000 birds)	1		1	*1*	-
Goose	Very small scale (< 100 birds)	1		1	-	*1*
Turkey	Small scale (50 - 1,250 birds)	1		1	-	-
Turkey	Medium scale (2,500 - 10,000 birds)	1		1	*1*	-
TOTAL	**TOTAL**	**12**	**-**	**12**	***3***	***8***

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel and does not represent primary agricultural activity.

"Intensive" livestock activities utilize specialized structures at high stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns.

Table A13. Distribution of poultry activities by parcel size and scale

Parcel size (ha)	Scale of poultry activities				Total number of activities
	Very small (< 100 birds)	Small (100 - 2,500 birds)	Medium (2,500 - 10,000 birds)	Large (> 10,000 birds)	
< 1	4	-	1	-	5
1 - 2	1	-	-	-	1
2 - 4	2	1	1	-	4
4 - 8	-	1	-	-	1
8 - 16	-	-	-	1	1
16 - 32	-	-	-	-	-
32 - 64	-	-	-	-	-
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	**7**	**2**	**2**	**1**	***12***
AVERAGE PARCEL SIZE (ha)	**1 ha**	**3 ha**	**1 ha**	**15 ha**	***3 ha***

Figure A5. Distribution of poultry activities by parcel size and scale

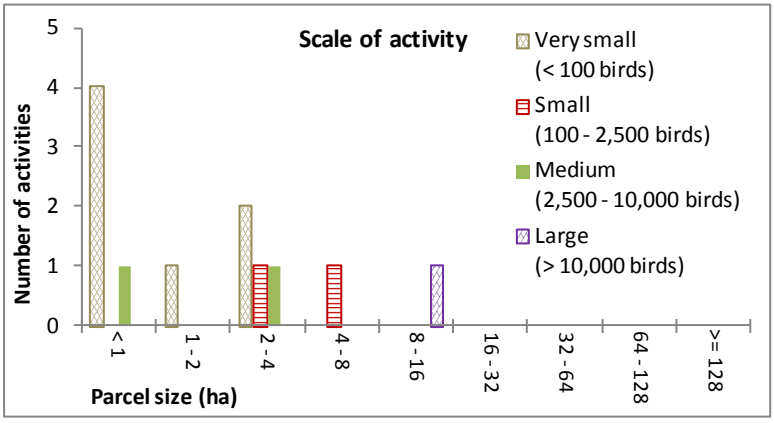
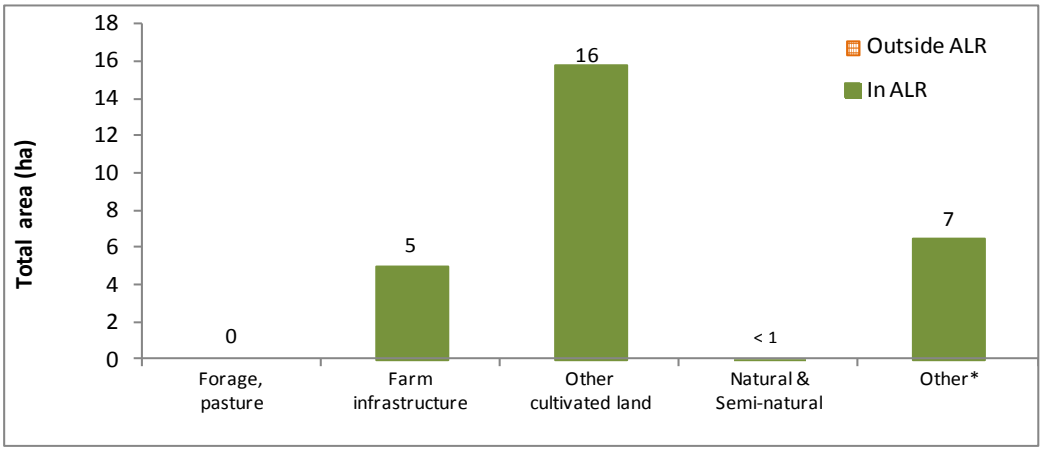


Figure A6. Land cover on parcels with poultry activities



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

Table A14. Sheep / lamb / goat activities

Activity	Scale	By parcel		Total number of activities	*By activity type*	
		Main type	Secondary type		*Intensive*	*Non intensive*
Goat	Very small scale (< 5 goats)	1	2	3	-	*3*
Sheep / lamb	Small scale (5 - 125 goats)	-	1	1	-	*1*
TOTAL	**TOTAL**	**1**	**3**	**4**	**-**	***4***

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel and does not represent primary agricultural activity.

"Intensive" livestock activities utilize specialized structures at high stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns.

Table A15. Distribution of sheep / lamb / goat activities by parcel size and scale

Parcel size (ha)	Scale of poultry activities				Total number of activities
	Very small (5 goats or 10 sheep)	Small (5-125 goats or 10-250 sheep)	Medium (125-500 goats or 250- 1000 sheep)	Large (>500 goats or >1000 sheep)	
< 1	2	-	-	-	2
1 - 2	-	-	-	-	-
2 - 4	-	-	-	-	-
4 - 8	-	-	-	-	-
8 - 16	-	-	-	-	-
16 - 32	1	-	-	-	1
32 - 64	-	1	-	-	1
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	**3**	**1**	**-**	**-**	***4***
AVERAGE PARCEL SIZE (ha)	**11 ha**	**33 ha**	**-**	**-**	***16 ha***

Figure A7. Distribution of sheep / lamb / goat activities by parcel size and scale

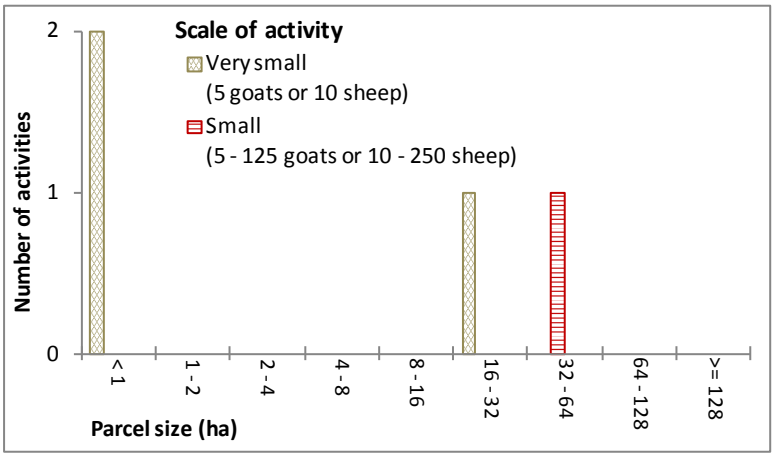
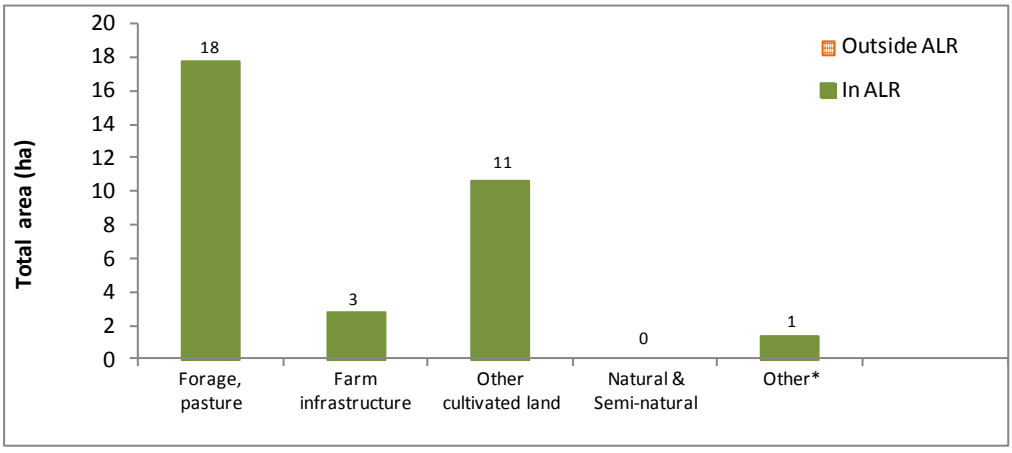


Figure A8. Land cover on parcels with sheep / lamb / goat activities



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

Table A16. Equine activities

Type of activity	Scale of equine activity	By parcel		Total number of activities	*By activity type*	
		Main Type	Secondary Type		*Intensive*	*Non intensive*
	Very small scale (1 horse)	3	1	4	-	*4*
	Small scale (2 - 25 horses)	24	1	25	-	*25*
Boarding	Small scale (2 - 25 horses)	1	-	1	-	*1*
	Medium scale (25 - 100 horses)	2	-	2	-	*2*
TOTAL	**TOTAL**	**30**	**2**	**32**	**-**	***32***

"Main Type" and "Secondary Type" of livestock are determined by comparing the scale of different livestock activities on the parcel and does not represent primary agricultural activity.

"Intensive" livestock activities utilize specialized structures such as barns, feedlots and stockyards designed for confined feeding at high stocking densities.

"Non Intensive" livestock activities allow animals to graze on a pasture and often utilize non intensive barns and corrals/paddocks.

Table A17. Distribution of equine activities by parcel size and scale

Parcel size (ha)	Scale of equine activities				Total number of activities
	Very small (1 - 2 equine)	Small (2 - 25 equine)	Medium (25 - 100 equine)	Large (> 100 equine)	
< 1	2	4	-	-	6
1 - 2	-	6	-	-	6
2 - 4	-	7	1	-	8
4 - 8	1	3	1	-	5
8 - 16	-	1	-	-	1
16 - 32	1	2	-	-	3
32 - 64	-	2	-	-	2
64 - 128	-	1	-	-	1
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	**4**	**26**	**2**	**-**	**32**
AVERAGE PARCEL SIZE (ha)	**10 ha**	**10 ha**	**5 ha**	**-**	***10 ha***

Figure A9. Distribution of equine activities by parcel size and scale

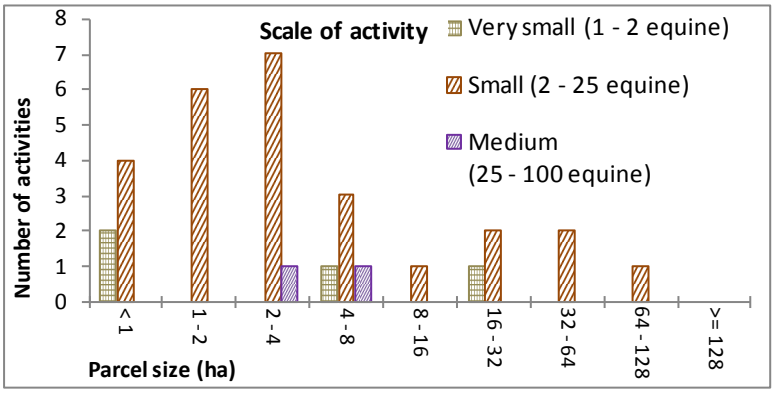
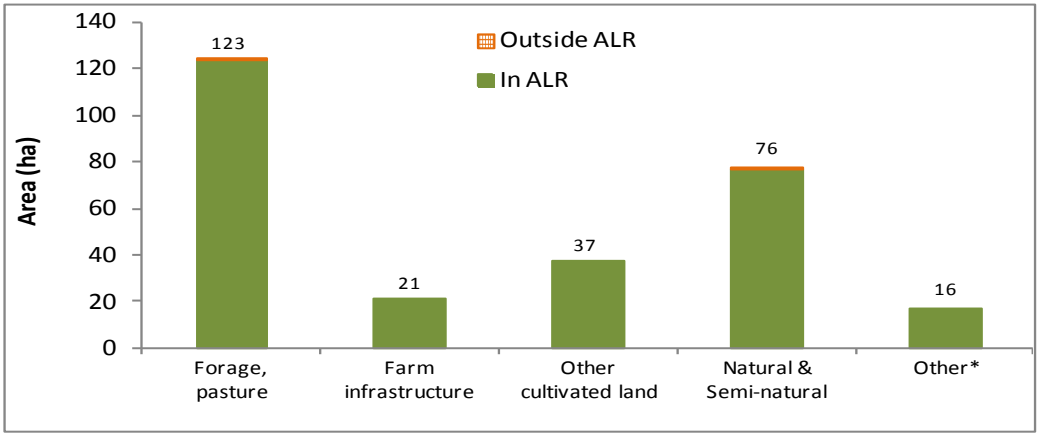


Figure A10. Land cover on parcels with equine activities



* Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fill dumps.

VALUE ADDED

Table A18. Value added activities

Value added	Description	Scale of activity			Total number of activities	Average parcel size (ha)
		Small scale	Medium scale	Large scale		
Agritourism	Seasonal events	-	2	-	2	3.6
Agritourism	Tours	-	1	-	1	1.6
Direct sales	Permanent retail store	-	6	1	7	7.4
Direct sales	Seasonal store (stand)	31	15	-	46	5.5
Direct sales	U-pick	7	3	-	10	11.3
Processing	Wine / cider processing	-	2	-	2	1.9
TOTAL NUMBER OF ACTIVITIES		**38**	**29**	**1**	**68**	

Table A19. Distribution of value added activities by parcel size

Parcel size (ha)	Agritourism		Direct Sales			Processing	Total number of activities
	Seasonal events	Tours	Permanent retail store	Seasonal store (stand)	U-pick	Wine / cider processing	
< 1	-	-	2	11	1	-	14
1 - 2	1	1	1	7	2	2	14
2 - 4	-	-	1	14	1	-	16
4 - 8	1	-	1	5	1	-	8
8 - 16	-	-	1	3	1	-	5
16 - 32	-	-	1	5	4	-	10
32 - 64	-	-	-	1	-	-	1
64 - 128	-	-	-	-	-	-	-
>= 128	-	-	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	**2**	**1**	**7**	**46**	**10**	**2**	***68***
AVERAGE PARCEL SIZE (ha)	**4 ha**	**2 ha**	**7 ha**	**6 ha**	**11 ha**	**2 ha**	***6 ha***

Table A20. Distribution of direct sales by parcel size and scale

Parcel size (ha)	Permanent retail store			Seasonal store		U-pick		Total number of activities
	Small scale	Medium scale	Large scale	Small scale	Medium scale	Small scale	Medium scale	
< 1	-	2	-	4	7	-	1	14
1 - 2	-	1	-	6	1	2	-	10
2 - 4	-	1	-	10	4	1	-	16
4 - 8	-	1	-	4	1	1	-	7
8 - 16	-	1	-	3	-	1	-	5
16 - 32	-	-	1	3	2	2	2	10
32 - 64	-	-	-	1	-	-	-	1
64 - 128	-	-	-	-	-	-	-	-
>= 128	-	-	-	-	-	-	-	
TOTAL NUMBER OF ACTIVITIES	**-**	**6**	**1**	**31**	**15**	**7**	**3**	**63**
AVERAGE PARCEL SIZE (ha)	**-**	**4 ha**	**29 ha**	**6 ha**	**5 ha**	**10 ha**	**14 ha**	**7 ha**

Table A21. Distribution of agritourism by parcel size and scale

Parcel size (ha)	Seasonal events	Tours	Total number of activities
	Medium Scale	Large Scale	
< 1	-	-	-
1 - 2	1	1	2
2 - 4	-	-	-
4 - 8	1	-	1
8 - 16	-	-	-
16 - 32	-	-	-
32 - 64	-	-	-
64 - 128	-	-	-
>= 128	-	-	-
TOTAL NUMBER OF ACTIVITIES	**2**	**1**	**3**
AVERAGE PARCEL SIZE (ha)	**4 ha**	**2 ha**	**3 ha**

Table A22. Distribution of processing by parcel size and scale

Parcel size (ha)	Wine / cider processing	Total number of activities
	Medium scale	
< 1	-	-
1 - 2	2	2
2 - 4	-	-
4 - 8	-	-
8 - 16	-	-
16 - 32	-	-
32 - 64	-	-
64 - 128	-	-
>= 128	-	-
TOTAL NUMBER OF ACTIVITIES	**2**	**2**
AVERAGE PARCEL SIZE (ha)	**2 ha**	**2 ha**