

Growing Knowledge



Ministry of
Agriculture

Land Use Inventory Report

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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.

Cadastral – 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 Cadastral 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, and 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 Surrey. The ALUI was funded in part by Metro Vancouver and was completed with in-kind support from the City of Surrey and local farmers.

ALUIs can be used to understand which agricultural activities are occurring in the surveyed area. The data provides an estimate of 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 Surrey was conducted using a drive-by inventory that recorded land cover and land use on a per-parcel basis, as a “snapshot in time.” Included in the inventory were: i) all parcels completely or partially in the ALR; ii) all parcels within Metro Vancouver’s Regional Growth Strategy “Agriculture” designation; iii) all parcels within Metro Vancouver’s Regional Growth Strategy “Rural” designation and greater than one acre; iv) all parcels assessed as a farm by BC Assessment.

The ALR in Surrey consists of 9,290 ha. 93% of the ALR was surveyed, consisting of a total of 8,670 ha and 1,743 parcels, with the remaining 620 ha being in road rights of ways, foreshore, or parcels less than 100 square metres in size. An additional 1,388 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 4,886 (53%) was farmed (both actively and inactive), 1,422 ha was anthropogenically modified (15%), and 2,362 ha was in a natural or semi-natural state (25%). As mentioned above, 620 ha (7%) 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. An additional 430 ha outside of the ALR were farmed. 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 detailed definition of “Used for farming” see the Definitions section. In terms of land use in the ALR, 5,706 ha (61%) was defined as “Used for farming,” and 2,964 ha (32%) 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 protected areas/parks, utilities, and commercial & service). As before, 620 ha (7%) was not surveyed, and was not considered to be available for farming. 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 and how much of that has the potential to be farmed. The characteristics of these two types of land are also examined by looking at land cover 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 9,920 ha in Surrey's ALR, 620 ha (7%) 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 1,096 ha (12%) was considered to be unavailable for farming due to existing land use or land cover (e.g. it was in parks, golf courses, non-farm residential uses, etc.). Added to that was the 245 ha (3%) 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 4,827 ha (52%) of the ALR that was actively farmed, and 2,465 ha (27%) of the ALR that was available for farming. Of that 27%, 649 ha occurred on parcels that are already "Used for farming" and 1,816 ha occurred on parcels not "Used for farming." 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 clearing natural and semi-natural vegetation (446 ha) and converting the land cover with "Anthropogenic managed vegetation" (e.g. lawns, gardens) (115 ha). See Figures 7 and 8 for more 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 (1,563 ha). See Figures 9 and 10 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 forage & pasture at 2,362 ha (or 25% of the ALR) followed by berries at 1,407 ha (15%) and vegetables at 585 ha (6%). Within the berry category blueberries were the top crop in terms of area. Within the field vegetable category, mixed vegetables, cucurbits, and sweet corn were the top three crops in terms of area. Greenhouses (vegetable, floriculture, nursery and mixed) covered less than 1% of the ALR. 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 (2,025 ha), and were used on a broad range of crops. Trickle systems were the next most common (1,061 ha) and were used primarily on berry crops. Giant gun systems were third (265 ha) and were used on several types of crops. See Table 13 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 Surrey inventory results showed that equines were the most common type of livestock activity (with 102 out of 255 activities), followed by poultry (57 out of 255 activities) and beef (33 out of 255 activities). There were 33 intensive poultry activities in Surrey and 24 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. See the Definitions section for more information, as well as Table 15 and Maps B13 to B16.

On-farm value added activities were only observed on 8% of all parcels "Used for farming." These included: 2 agritourism activities (1 corn maze and 1 seasonal event), 57 parcels with direct sales (33 seasonal stores/stands, 3 permanent stores/stands, and 3 U-picks), and 3 parcels with processing (1 crop, 1 meat, and 1 wine/cider processing). See Figures 35 and 36 for more information.

In terms of condition of ALR lands, further analysis was conducted on 1,300 parcels with 8,630 ha or 92.9% of Surrey's ALR land. This additional analysis found that while 61% of the parcels are less than 4 ha in size, they make up only 18% of the total area. Most of Surrey's ALR is in larger parcels. The majority of the parcels "Not used for farming" are less than 4 ha in size. See Figures 38 to 40 for more information.

Residential uses occurred on 805 parcels, and 375 of those parcels were "Not used for farming". Houses greater than 3,500 sq. ft. in size were found on 107 parcels and one third of those parcels (36 parcels) were "Not used for farming". See Tables 17 and 18 for more information.

Agrologist Comments

Surrey's agriculture industry began in the 1870s with pioneer farms that located in the Serpentine and Nicomekl River lowlands. Dairy, meat and vegetables were sold to New Westminster and Victoria by boat. The Surrey Farmers' Institute was founded in 1907. A Dyking District was formed in 1911, which oversaw the installation of dykes and tide flood gates for the lowlands, which were susceptible to flooding¹.

Today, Surrey accounts for 22% of the total gross annual farm receipts in Metro Vancouver, on 15% of Metro Vancouver's Agricultural Land Reserve (ALR) area. The key sectors are poultry, dairy, berry and vegetable production. Surrey is also home to the province's largest floriculture greenhouse operation.

The City of Surrey has actively planned for agriculture through the Official Community Plan (revised in 2013), an Agriculture Protection and Enhancement Strategy (2013), and two innovative policies – one on residential buffering adjacent to the ALR/agricultural edge, and one on compensation and mitigation requirements for ALR exclusion applications. The City's Agriculture Advisory Committee (now renamed the Agriculture and Food Security Advisory Committee) was founded in 1995, and continues to play an active role in agricultural planning. As part of increasing the public's awareness of the importance of agriculture, the City has sponsored an annual "Flavours of Surrey" event, celebrating local food and farms.

As the fastest growing municipality in the province, Surrey faces many challenges in preserving and maintaining its agricultural land base and its farming sector.

Some of the policy challenges identified by the data analysis in this report include:

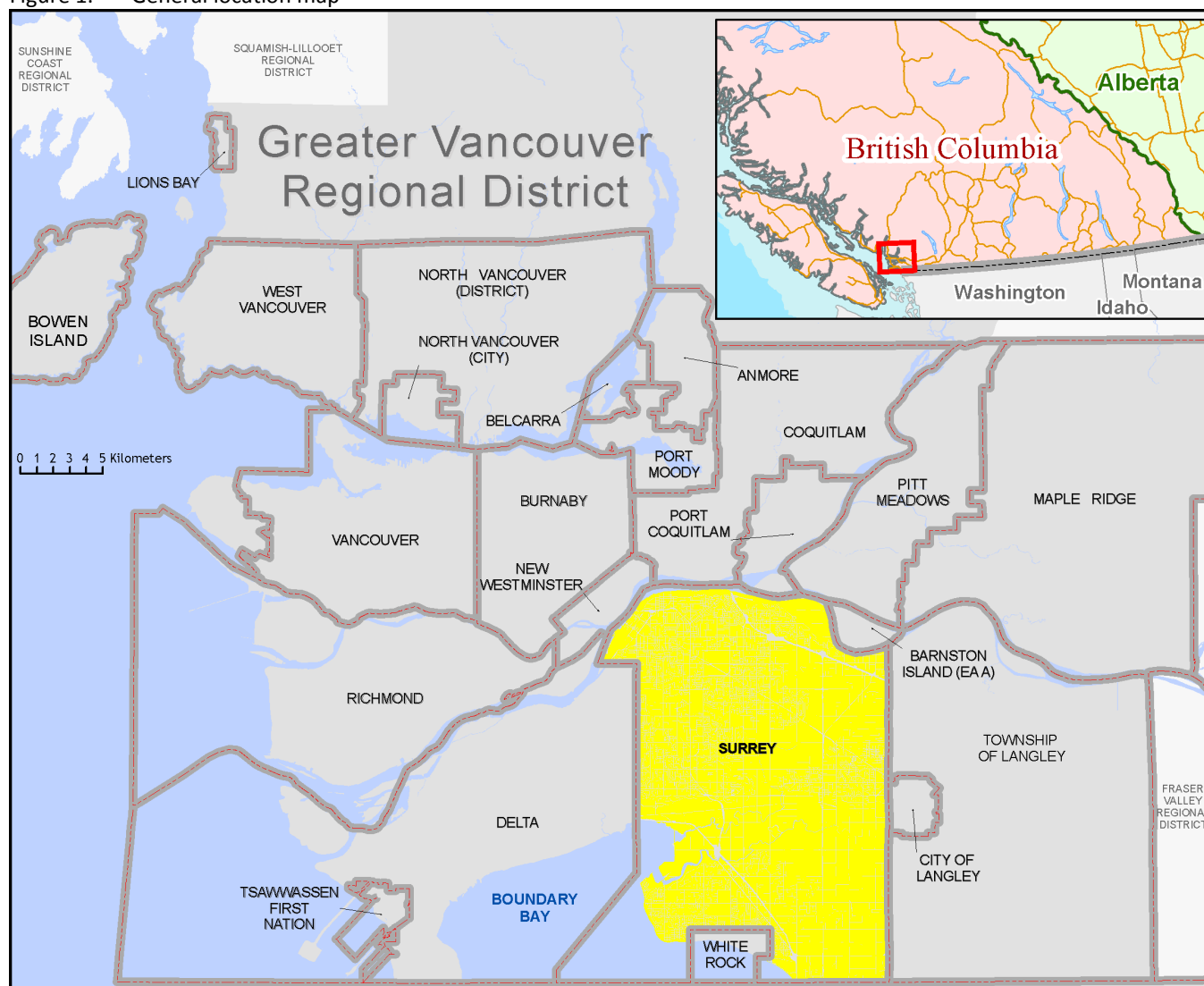
- Surrey's ALR area is already parcelized, and does not need further subdivision. (The City's zoning bylaw specifies a minimum parcel size of 4 ha within the ALR in the A1 zone, so few subdivision applications have been approved.)
- Smaller parcels are underutilized for farming. This result is typical of other local governments in the province.
- There is a significant amount of land (approx. 20%) within the ALR that is not available for farming, due to existing land uses and covers. The City may wish to consider whether any further non-farm uses are needed.
- Expansion of farming will require tree cutting and/or land draining (approx. 2,000 ha). The City has recently adopted a Biodiversity Conservation Strategy, so these types of agricultural land improvement methods may not be completely compatible with the goals of that strategy.
- Expansion and/or intensification of farming will also require irrigation for approximately another 3,600 ha of land. The Provincial government is not issuing any further surface water licences for the Nicomekl, Serpentine, or Little Campbell Rivers, so alternate sources of irrigation water will need to be investigated.
- Houses, including large or estate homes, are sometimes not associated with farming.
- The larger the home, the higher the assessed land improvement value, and the less available the property will be for purchase as a farm in the future.

¹ For more information on the history of agriculture in Surrey, please see <http://www.surreyhistory.ca>.

General Community Information

The City of Surrey is located east of Vancouver on the mainland of British Columbia. Surrey's total area (including water) is 37,140 hectares². The city is bordered by the Fraser River to the north, Township and City of Langley to the east, the U.S. border to the south, and Delta and Boundary Bay to the west. Surrey is part of Greater Vancouver Regional District.

Figure 1. General location map



² 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

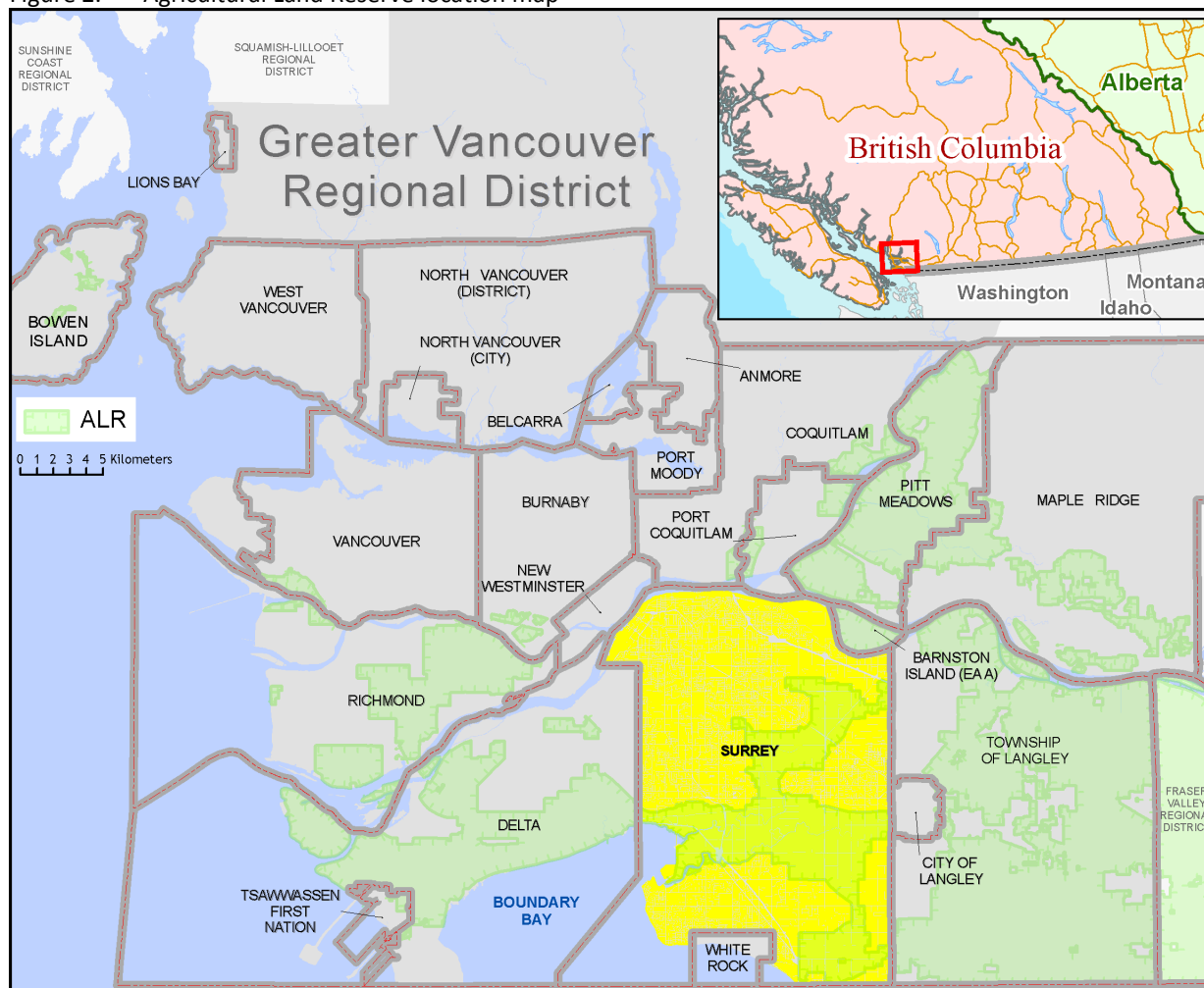
The Agricultural Land Reserve (ALR) is a provincial land use zone that was designated in 1973 in which agriculture is recognized as the priority use. Within the ALR, farming is encouraged and non-agricultural uses are controlled.

There are 60,554 hectares³ of ALR land within the Greater Vancouver Regional District (shown in Figure 2); 9,290 hectares⁴ or over 15% is within Surrey.

The land area of Surrey is 28,165 hectares⁵. With 9,290 hectares³ in the ALR, 33% of the land area of the city is in the ALR. This area includes:

- 8,670 hectares in surveyed parcels
- 620 hectares outside surveyed parcels
 - 614 hectares of designated rights-of-way
 - 5 hectares of foreshore
 - 1 hectare of parcels less than 100 square meters

Figure 2. Agricultural Land Reserve location map



³ 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.

⁴ Agricultural Land Commission, ALR mapping, Land and Resource Data Warehouse, 2010-01-31 (area calculated in GIS).

⁵ Calculated in GIS.

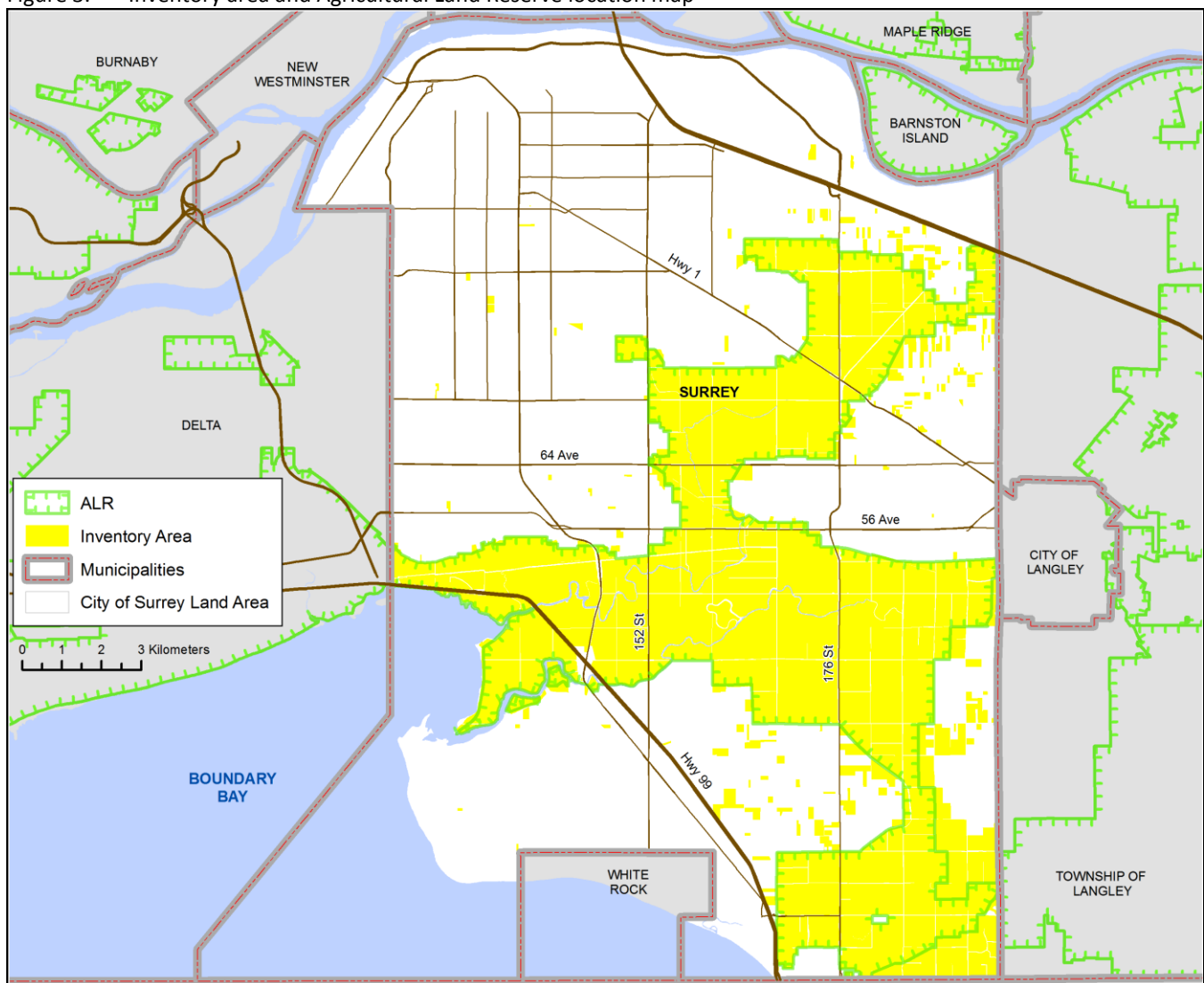
INVENTORY AREA

The total inventory area encompasses 1,743 parcels with a combined area of 10,058 hectares, or almost 36% of the land area in Surrey. 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 8,670 hectares located on 1,388 parcels. This area is over 93% of the ALR within Surrey. The remaining 7% 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 and foreshore.

Figure 3. Inventory area and Agricultural Land Reserve location map



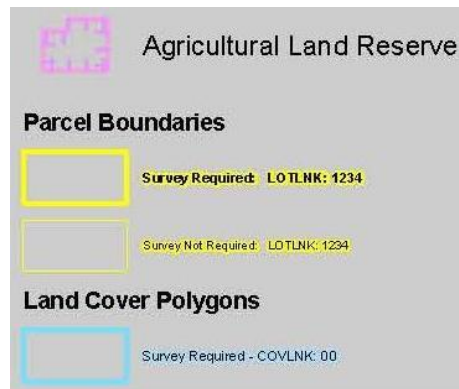
Agricultural Land Use Inventory

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 Surrey land use inventory was conducted in the summer of 2010 by a professional agrologist assisted by a GIS technician and a driver⁶. 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)⁷
- 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



⁶ Vehicle and driver provided by the City of Surrey.

⁷ Cadastre mapping (2010) was provided by the City of Surrey 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.

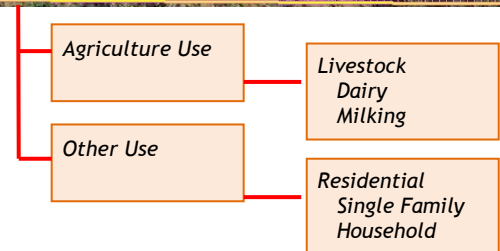
Once acquired through the survey, the data was brought into a Geographic Information System (GIS) to facilitate analysis and mapping. Digital data, in the form of a tabular database and GIS spatial layers (for maps), may be available with certain restrictions through a terms of use agreement.

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

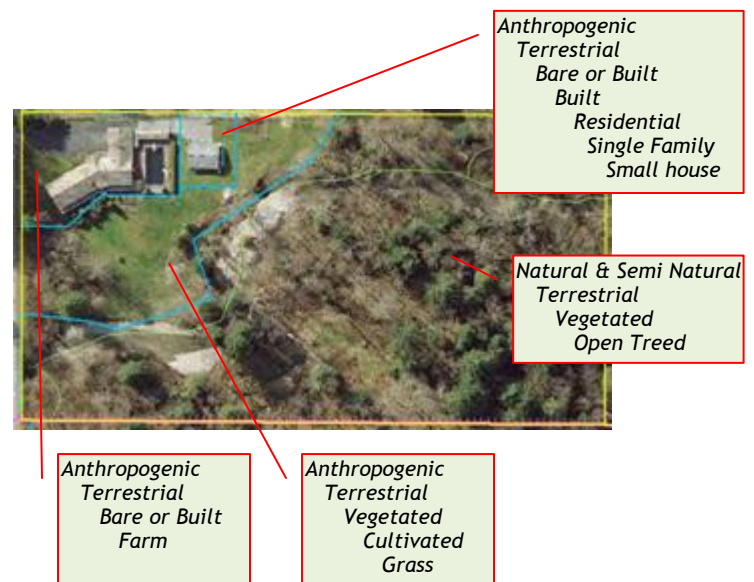
In addition, the availability of non-farm use properties for future farming was assessed based on the amount of potential land for farming on the property and the compatibility of existing uses with future farming activities.



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.

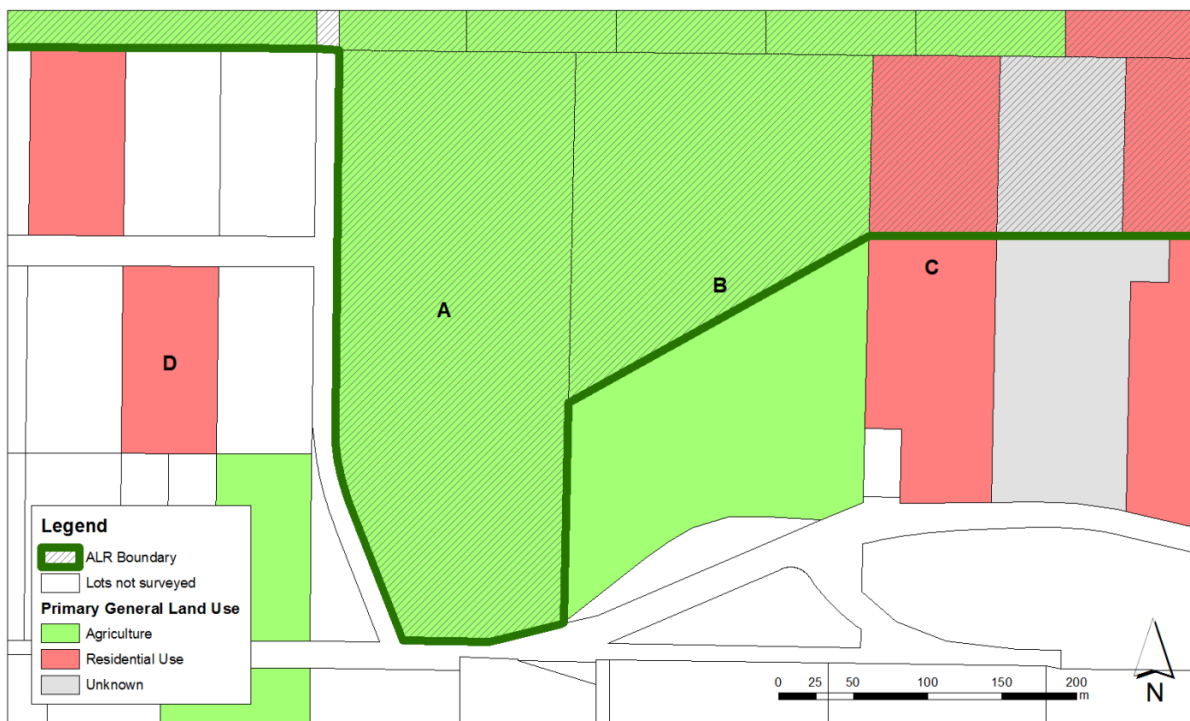
DETERMINATION OF PARCELS WITHIN THE ALR

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	4,554	49%	325	4,880	49%
	Farm infrastructure	205	2%	71	276	3%
	Greenhouses	66	1%	5	71	< 1%
	Crop barns	2	< 1%	<1	2	< 1%
Inactively farmed	Unmaintained field crops	32	< 1%	<1	32	< 1%
	Unused forage or pasture	25	< 1%	26	51	< 1%
	Unmaintained greenhouses	3	< 1%	2	5	< 1%
FARMED SUBTOTAL		4,886	53%	430	5,316	53%
Anthropogenic (not farmed)	Managed vegetation	689	7%	160	848	8%
	Non Built or Bare	110	1%	31	141	1%
	Residential footprint	158	2%	80	238	2%
	Settlement	72	< 1%	25	97	< 1%
	Transportation	97	1%	24	121	1%
	Utilities	149	2%	1	150	1%
	Built up - Other	30	< 1%	4	33	< 1%
	Waterbodies	120	1%	10	129	1%
SUBTOTAL		1,422	15%	335	1,757	17%
Natural and Semi-natural	Vegetated	2,311	25%	615	2,926	29%
	Wetlands	34	< 1%	3	36	< 1%
	Waterbodies	17	< 1%	6	23	< 1%
SUBTOTAL		2,362	25%	624	2,985	30%
TOTAL		8,670	93%	1,388	10,058	100%
Not surveyed	Rights-of-way	614	7%			
	Foreshore	5	< 1%			
	Parcels < 100 m ²	1	< 1%			
SUBTOTAL		620	7%			
TOTAL		9,290	100%			

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

In Surrey, 5,316 hectares of land is in “Farmed” land cover although 88 of those hectares are “Inactively farmed” in unmaintained field crops, unused forage or pasture, or unmaintained greenhouses.

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

Figure 5. Land cover and farmed area in the ALR

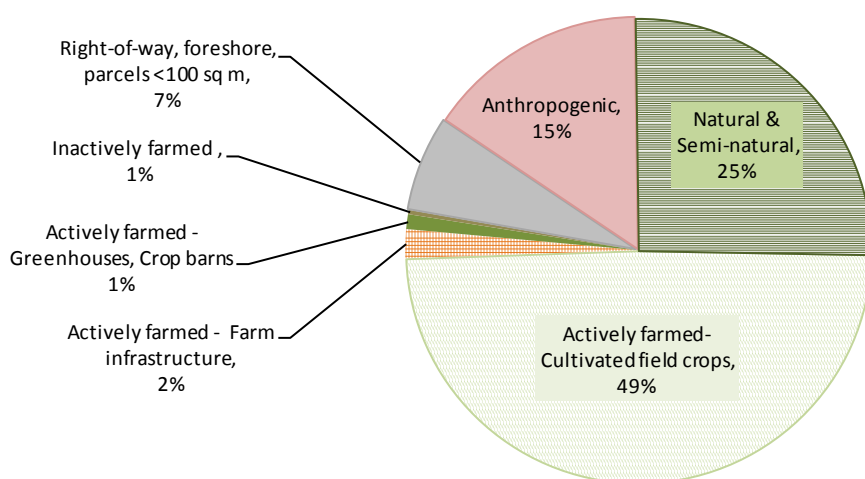


Figure 5 shows the proportions of the different land cover types across the ALR in Surrey.

Of Surrey's ALR land, 52% is "Actively farmed" while 1% is in unmaintained field crops, unused forage or pasture, 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		1,500	16 %	66	1,566	16 %	194	11 %	8
Used for farming - Mixed use	Residential	3,620	39 %	412	4,032	40 %	539	31 %	7
	Protected area / park / reserve	136	1 %	-	136	1 %	2	<1 %	68
	Utilities	120	1 %	-	120	1 %	5	<1 %	24
	Commercial & service	96	1 %	5	102	1 %	14	<1 %	7
	Transportation & communications	76	<1 %	-	76	<1 %	3	<1 %	25
	Recreation & leisure	64	<1 %	-	64	<1 %	1	<1 %	64
	Industrial	46	<1 %	< 1	46	<1 %	6	<1 %	8
	Water management	24	<1 %	< 1	24	<1 %	3	<1 %	8
	Dumps & deposits	18	<1 %	-	18	<1 %	2	<1 %	9
	Institutional & community	6	<1 %	17	23	<1 %	2	<1 %	11
USED FOR FARMING SUBTOTAL		5,706	61 %	500	6,206	62 %	771	44 %	
Not used for farming	Residential	1,181	13 %	603	1,785	18 %	565	32 %	3
	No apparent use	722	8 %	144	866	9 %	214	12 %	4
	Golf	503	5 %	36	539	5 %	29	2 %	19
	Protected area / park / reserve	263	3 %	29	292	3 %	42	2 %	7
	Transportation & communications	63	<1 %	13	76	<1 %	40	2 %	2
	Industrial	54	<1 %	19	73	<1 %	23	1 %	3
	Water management	41	<1 %	5	46	<1 %	13	<1 %	4
	Recreation & leisure	41	<1 %	8	49	<1 %	5	<1 %	10
	Commercial & service	33	<1 %	15	48	<1 %	20	1 %	2
	Institutional & community	32	<1 %	3	35	<1 %	11	<1 %	3
	Utilities	27	<1 %	4	31	<1 %	5	<1 %	6
	Dumps & deposits	4	<1 %	4	8	<1 %	4	<1 %	2
	Land in transition	< 1	<1 %	4	4	<1 %	1	<1 %	4
NOT USED FOR FARMING SUBTOTAL		2,964	32 %	888	3,852	38 %	972	56 %	
TOTAL		8,670	93 %	1,388	10,058	100 %	1,743	100 %	
Not surveyed	Rights-of-way	614	7 %						
	Foreshore	5	<1 %						
	Parcels < 100 m ²	1	<1 %						
SUBTOTAL		620	7 %						
TOTAL		9,290	100 %						

Table 2 shows that 5,706 hectares or 61% of Surrey's ALR is on parcels "Used for farming".

Most "Used for Farming" parcels are also used for other purposes with only 194 parcels or 16% of the ALR area exclusively "Used for farming."

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		1,254	13 %	87	<1 %	159	2 %	1,500	16 %
Used for farming - mixed use	Residential	3,065	33 %	337	4 %	217	2 %	3,620	39 %
	Protected area / park / reserve	77	<1 %	33	<1 %	26	<1 %	136	1 %
	Utilities	92	<1 %	3	<1 %	25	<1 %	120	1 %
	Commercial & service	69	<1 %	19	<1 %	9	<1 %	96	1 %
	Transportation & communications	61	<1 %	15	<1 %	< 1	<1 %	76	<1 %
	Recreation & leisure	19	<1 %	-	-	45	<1 %	64	<1 %
	Industrial	34	<1 %	8	<1 %	4	<1 %	46	<1 %
	Water management	20	<1 %	3	<1 %	-	-	24	<1 %
	Dumps & deposits	16	<1 %	2	<1 %	-	-	18	<1 %
Institutional & community	5	<1 %	-	-	1	<1 %	6	<1 %	
SUBTOTAL		4,712	51 %	508	5 %	487	5 %	5,706	61 %
Not used for farming		175	2 %	915	10 %	1,875	20 %	2,964	32 %
SUBTOTAL		4,886	53 %	1,422	15 %	2,361	25 %	8,670	93 %
Not surveyed	Rights-of-way							614	7 %
	Foreshore							5	<1 %
	Parcels < 100 m²							1	<1 %
	SUBTOTAL							620	7 %
TOTAL ALR								9,290	100 %

* Some parcels that are "Not used for farming" have "Farmed" land cover, however, the extent or intensity 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 Surrey. For example, parcels with the mixed uses "Used for farming" and "Residential" have a total of 3,065 hectares in "Farmed" land cover, 337 hectares in "Anthropogenic" (not farmed) land cover, and 217 hectares in "Natural & Semi-natural" land cover.

Although 5,706 hectares or 61% of Surrey's ALR is on parcels "Used for farming" (refer to Table 2), only 4,886 hectares or 53% of the ALR is actually in "Farmed" land cover as many "Used for farming" parcels are also used for other purposes. In fact, the majority of the "Farmed" land cover in the ALR (33%) 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 ⁸. 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 tend to have very high land values making it unrealistic for a farmer to acquire and convert this land to farmland.

In Surrey, properties in the ALR and “Used for farming” have an average assessed value of \$53,500 per hectare, while properties in the ALR but unavailable for farming have an average assessed value of \$1,629,935 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.

⁸ 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	4,554	49 %	325	4,880	49 %
	Farm infrastructure	205	2 %	71	276	3 %
	Greenhouses	66	1 %	5	71	<1 %
	Crop barns	2	<1 %	< 1	2	<1 %
ACTIVELY FARMED		4,827	52 %	402	5,228	52 %
Anthropogenic areas supporting farming	Built up - Other	115	1 %	< 1	115	1 %
	Residential footprint	85	<1 %	23	108	1 %
	Artificial waterbodies	33	<1 %	3	36	<1 %
	Transportation	12	<1 %	1	14	<1 %
SUPPORTING FARMING		245	3 %	28	272	3 %
Unavailable for farming due to existing land use	Golf	485	5 %	36	521	5 %
	Protected area / park / reserve	267	3 %	27	294	3 %
	Transportation & communications	36	<1 %	12	48	<1 %
	Residential	19	<1 %	4	24	<1 %
	Institutional & community	9	<1 %	1	10	<1 %
	Water management	3	<1 %	< 1	3	<1 %
	Commercial & service	2	<1 %	< 1	2	<1 %
	Utilities	< 1	<1 %	-	< 1	<1 %
	Industrial	< 1	<1 %	5	5	<1 %
	Recreation & leisure	< 1	<1 %	< 1	< 1	<1 %
	Land in transition	< 1	<1 %	4	4	<1 %
Unavailable for farming due to existing land cover	Built up - Other	72	<1 %	22	94	<1 %
	Residential footprint	58	<1 %	49	106	1 %
	Waterbodies	48	<1 %	6	54	<1 %
	Utilities	34	<1 %	< 1	35	<1 %
	Transportation	34	<1 %	10	44	<1 %
	Wetlands	28	<1 %	2	30	<1 %
UNAVAILABLE FOR FARMING		1,096	12 %	180	1,276	13 %
Site limitations	Operational	18	<1 %	11	29	<1 %
	Drainage	18	<1 %	< 1	18	<1 %
	Slope	2	<1 %	3	5	<1 %
LIMITED POTENTIAL FOR FARMING		38	<1 %	14	52	<1 %
Available & with potential for farming	Natural & Semi-natural - Vegetation	2,009	22 %	564	2,572	26 %
	Anthropogenic - Managed vegetation	290	3 %	145	435	4 %
	Anthropogenic - Non Built or Bare	107	1 %	28	135	1 %
	Unmaintained field crops	32	<1 %	< 1	32	<1 %
	Unused forage or pasture	25	<1 %	26	51	<1 %
	Unmaintained greenhouses	3	<1 %	2	5	<1 %
AVAILABLE & WITH POTENTIAL FOR FARMING		2,465	27 %	765	3,230	32 %
TOTAL		8,670	93 %	1,388	10,058	100 %
Not surveyed	Rights-of-way	614	7 %			
	Foreshore	5	<1 %			
	Parcel areas < 100 sq m	1	<1 %			
SUBTOTAL		620	7 %			
TOTAL		9,290	100 %			

Table 4 shows that 3,230 hectares or 32% 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. Over three-quarters of this, or 2,465 hectares, is ALR land.

Refer to Map B5 in Appendix B for more information.

Figure 6. Availability and potential of ALR lands for farming

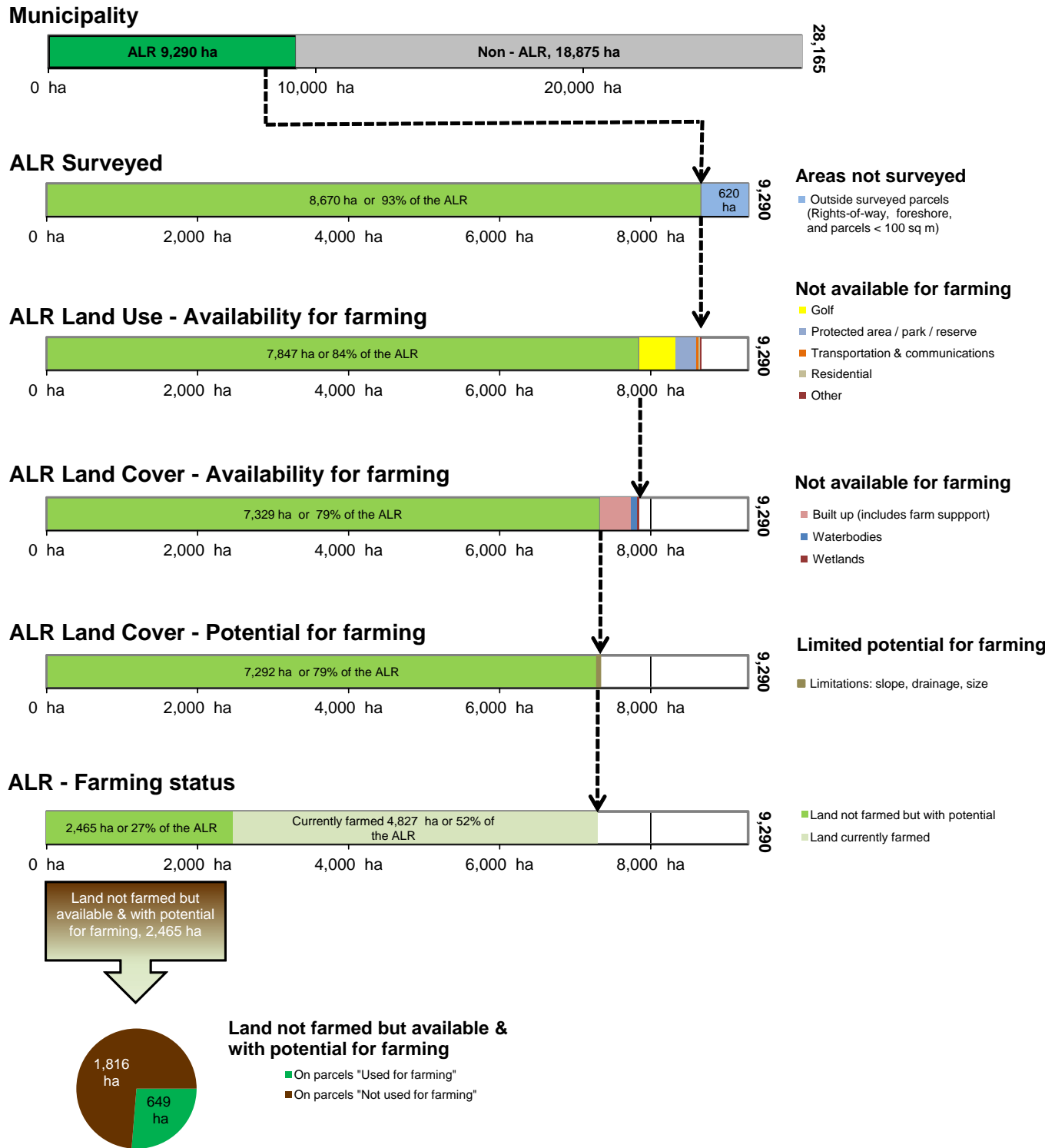


Figure 6 demonstrates that 7,292 hectares, or 79%, of Surrey’s ALR is currently available for farming once road rights-of-way, golf courses, protected areas, parks, residential footprints, and other land uses, land covers, and site limitations incompatible with agriculture are taken into account. Of those 7,292 hectares, 4,827 hectares are actively farmed and 2,465 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 may also be 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	301	358	93	451	1,797	144	1,941	7 %
Used for farming only	60	183	14	197	606	21	627	4 %
Recreation & leisure	1	45	-	45	19	-	19	<1 %
Utilities	2	21	-	21	31	-	31	<1 %
Transportation & communications	2	18	-	18	28	-	28	<1 %
Commercial & service	7	15	1	16	53	-	53	<1 %
Industrial	3	6	< 1	6	17	< 1	17	<1 %
Dumps & deposits	2	2	-	2	16	-	16	<1 %
Institutional & community	2	1	4	5	5	7	12	<1 %
TOTAL	380	649	112	760	2,571	173	2,744	13 %

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 that are exclusively “Used for farming”.

Figure 7. Land cover available for farming but not farmed on ALR parcels “Used for farming”

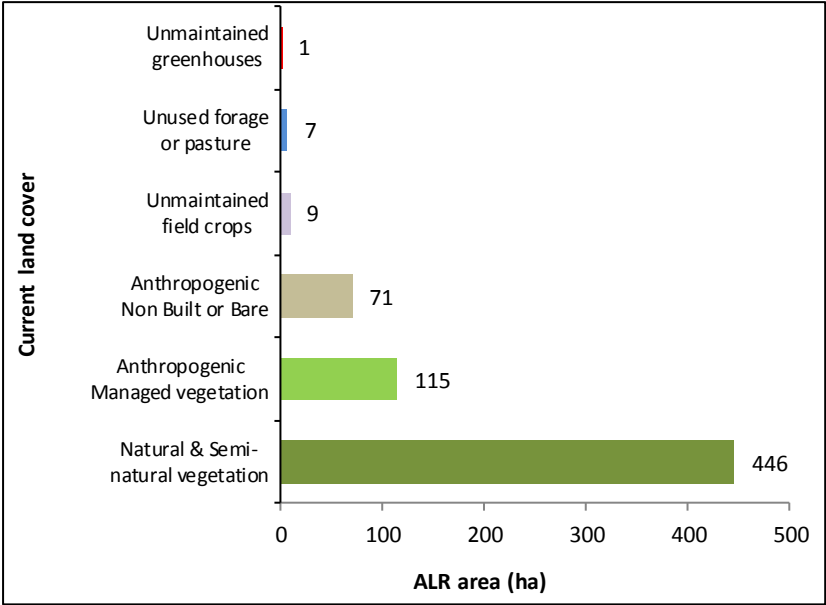


Figure 7 indicates that clearing land covered with “Natural and Semi-natural” vegetation would provide the greatest gains in farmed land on parcels that are already “Used for farming”.

Figure 8. Natural & Semi-natural land cover available for farming on ALR parcels “Used for farming”

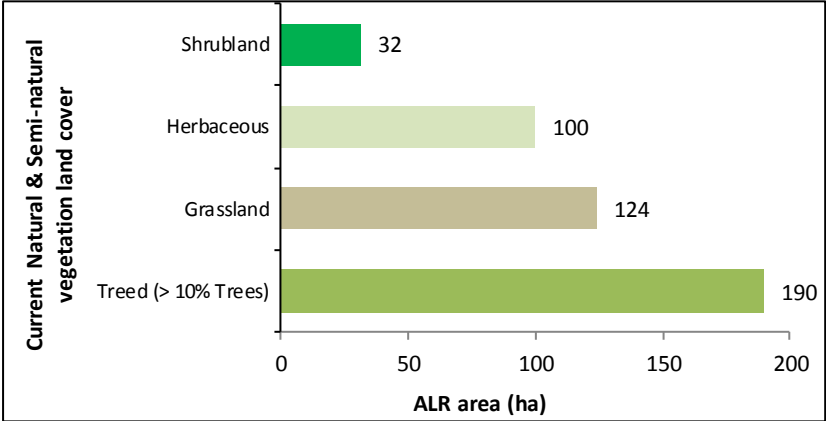


Figure 8 shows that treed areas are the most common type of “Natural & Semi-natural” land cover on parcels “Used for farming”.

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	Residential	483	969	479	1,448	20 %
	No apparent use	182	659	134	793	14 %
	Industrial	17	37	10	47	<1 %
	Water management	5	29	4	33	<1 %
	Recreation & leisure	4	27	7	33	<1 %
	Commercial & service	15	19	10	29	<1 %
	Institutional & community	4	19	2	21	<1 %
	Utilities	4	19	4	23	<1 %
	Transportation & communications	2	17	-	17	<1 %
	Golf	3	10	< 1	10	<1 %
	Protected area / park / reserve	1	8	-	8	<1 %
	Dumps & deposits	4	4	3	7	<1 %
TOTAL		724	1,816	653	2,469	38 %

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

Figure 9. Land cover available for farming but not farmed on ALR parcels “Not used for farming”

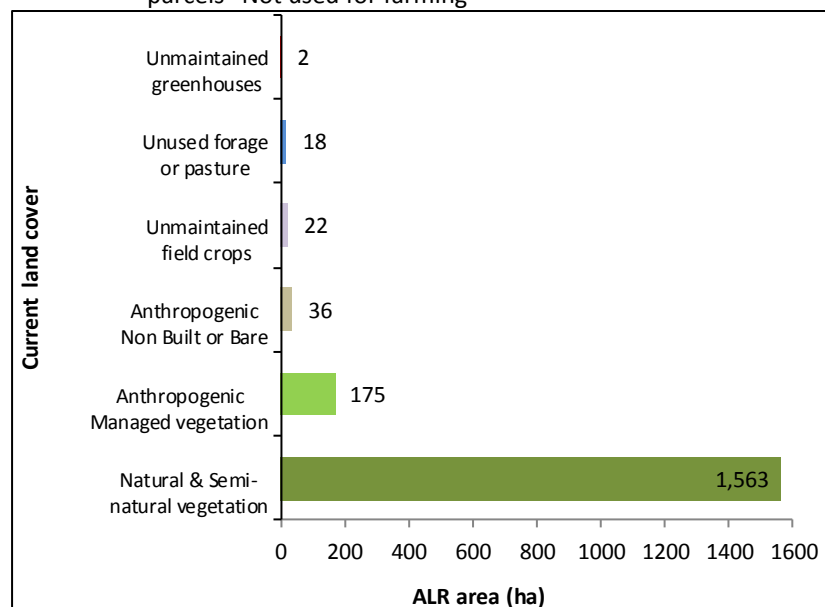


Figure 9 indicates that clearing land covered with “Natural and Semi-natural” vegetation would provide the greatest gains in farmed land on parcels currently “Not used for farming”.

Figure 10. Natural & Semi-natural land cover available for farming on ALR parcels “Not used for farming”

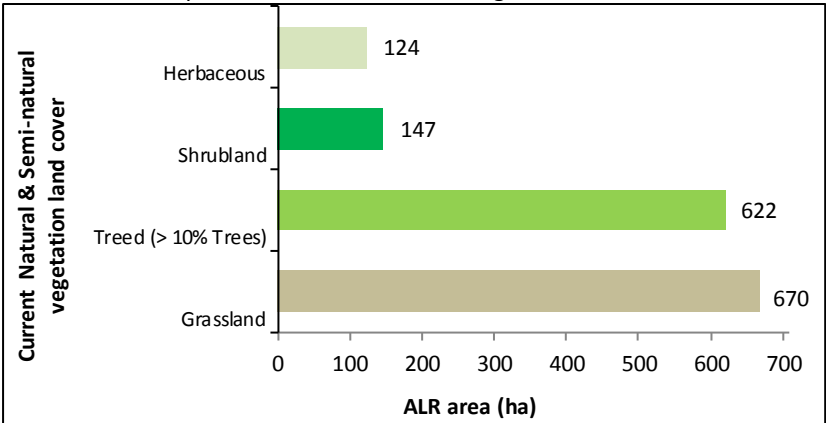


Figure 10 shows that grassland and treed areas are the most common type of “Natural & Semi-natural” land cover on parcels “Not used for farming”.

Figure 11. Size of areas available for farming but not farmed on parcels “Not used for farming”

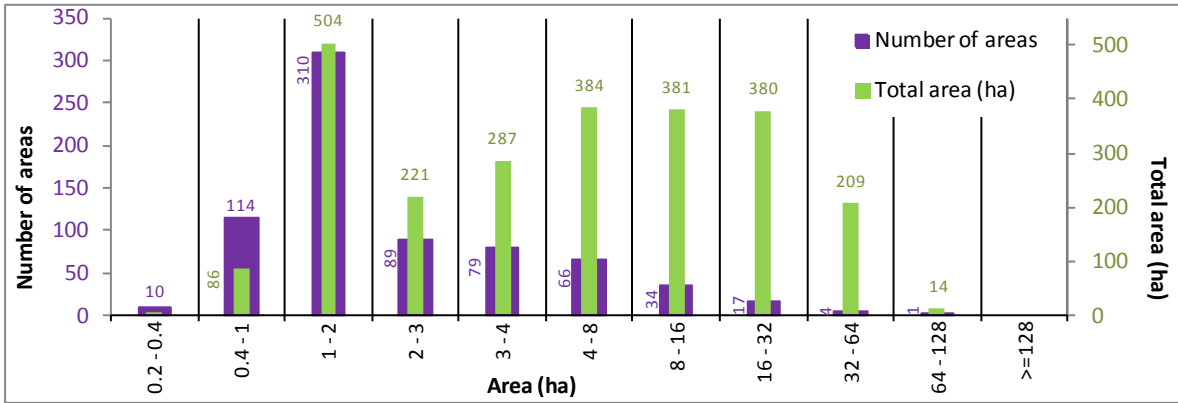


Figure 11 demonstrates that the majority of areas available for farming (434 of 724 or 60%) are less than 2 hectares in size. Fewer options are available to efficiently farm small parcels. In general, areas should be 4 hectares or more to provide the widest range of farming options.

In Surrey, there are 122 areas greater than 4 hectares in size with a combined area of 1,368 hectares that are available and have potential for farming. This area is 55% of the 2,469 hectares (refer to Table 6) that are “Not used for farming”, but are available and have potential for farming in the Surrey inventory area.

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 Surrey are described by ten crop groupings:

- **Forage & pasture:** grass, mixed grass/ legume, clover, forage corn
- **Berries:** blueberries, raspberries, cranberries, strawberries, blackberries, mixed berries
- **Vegetables:** mixed vegetables, cucurbits, sweet corn, Asian vegetables, pumpkins, potatoes, root vegetables
- **Nursery & tree plantations:** nursery (ornamentals, shrubs, cedar hedging, mixed), tree plantations
- **Cereals:** barley, oats, mixed
- **Other:** bare cultivated land, fallow land, cover grass
- **Specialty:** rhubarb, herbs
- **Vines:** grapes, kiwi
- **Tree fruits:** apples, plums, cherries
- **Nut trees:** hazelnut/filbert

Table 7. Main cultivated field crop types by area

Type	ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
	In ALR (ha)	% of ALR			
Forage & pasture	2,362	25%	304	2,667	54%
Berries	1,407	15%	8	1,416	29%
Vegetables	585	6%	17	602	12%
Nursery & tree plantations	95	1%	15	110	2%
Cereals	82	< 1%	< 1	82	2%
Other*	56	< 1%	3	59	1%
Specialty	13	< 1%	-	13	< 1%
Vines	8	< 1%	2	10	< 1%
Tree fruits	2	< 1%	2	4	< 1%
Nut trees	< 1	< 1%	-	< 1	< 1%
TOTAL	4,611	50%	352	4,963	100%

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

Table 7 shows the 10 main field crop types produced on the 4,963 hectares of cultivated land in Surrey.

“Forage & pasture” is the most common type of cultivated field crop accounting for 54% of all cultivated land and 25% of Surrey’s ALR.

Berries are the second most common type of cultivated crop accounting for 29% of all cultivated land and 15% of the ALR.

Refer to Map B7 in Appendix B for more information.

Figure 12. Main cultivated field crop types by percentage

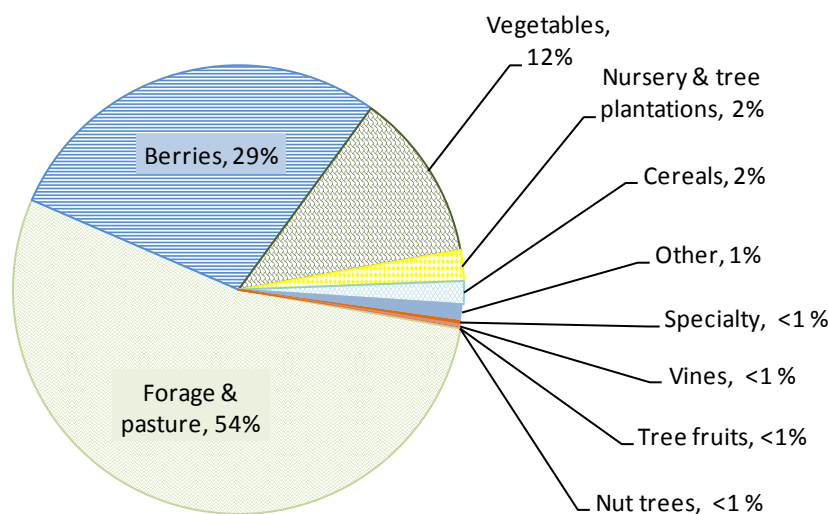


Figure 12 shows the proportion of main field crop types across Surrey’s cultivated land.

“Forage & pasture” combined with “Berries” combined with “Vegetables” comprise 95% of all cultivated land in Surrey.

Figure 13. All cultivated field crops by size

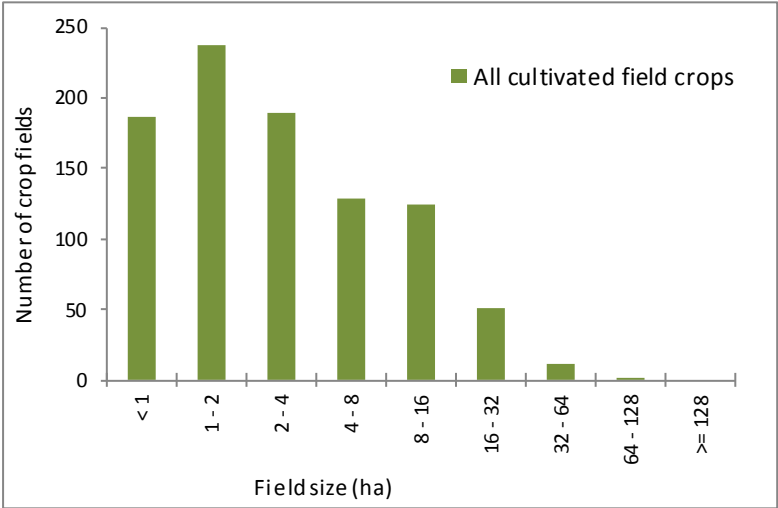


Figure 13 illustrates the number and size distribution of fields used for cultivated field crops.

In Surrey, cultivated fields are most likely to be less than 4 hectares in size.

There are 930 individual crop fields with an average area of 5 hectares and median area of 2 hectares.

The average size of parcels where field crops occur is 8 hectares.

Refer to Table A1 in Appendix A for more information.

Figure 14. Forage & pasture, berry, and vegetable fields by size

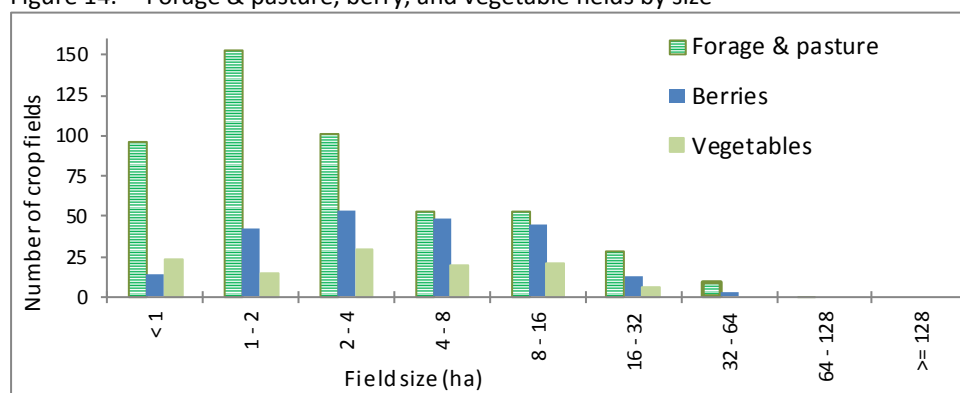


Figure 14 compares the top three main crop types by field sizes.

“Forage & pasture”, “Berry”, and “Vegetable” fields all occur on a wide range of field sizes.

Refer to Table A1 in Appendix A for more information.

Forage & pasture crops

Forage is a cultivated crop that is cut and made into silage or hay for livestock 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.

Areas previously used for forage or pasture are considered inactively farmed:

- **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 8. Forage & pasture crops by area

Forage and pasture crops		ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
		In ALR (ha)	% of ALR			
Forage ^	Grass	52	< 1%	-	52	1%
Forage (managed)	Grass	814	9%	25	839	17%
Forage (managed)	Mixed grass / legume	112	1%	3	115	2%
Forage (managed)	Forage corn	615	7%	< 1	615	12%
Forage (unmanaged)	Grass	81	< 1%	8	90	2%
Forage (unmanaged)	Mixed grass / legume	25	< 1%	< 1	25	< 1%
Subtotal		1,699	18%	37	1,736	35%
Pasture ^	Grass	9	< 1%	8	17	< 1%
Pasture (managed)	Grass	185	2%	10	195	4%
Pasture (unmanaged)	Grass	343	4%	219	562	11%
Pasture (unmanaged)	Mixed grass / legume	28	< 1%	1	30	< 1%
Subtotal		566	6%	239	804	16%
Forage & pasture (managed)	Grass	63	< 1%	3	66	1%
Subtotal		63	< 1%	3	66	1%
Unused	Clover	< 1	< 1%	-	< 1	< 1%
Unused	Grass	24	< 1%	26	50	1%
Unused	Mixed grass / legume	< 1	< 1%	-	< 1	< 1%
Unmaintained	Grass	9	< 1%	-	9	< 1%
Subtotal		35	< 1%	26	61	1%
TOTAL		2,362	25	304	2,667	54

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

Table 8 shows that there is significantly more forage than pasture in Surrey. Grass is the main forage crop type.

Refer to Map B8 in Appendix B for more information.

Figure 15. Forage & pasture fields by size

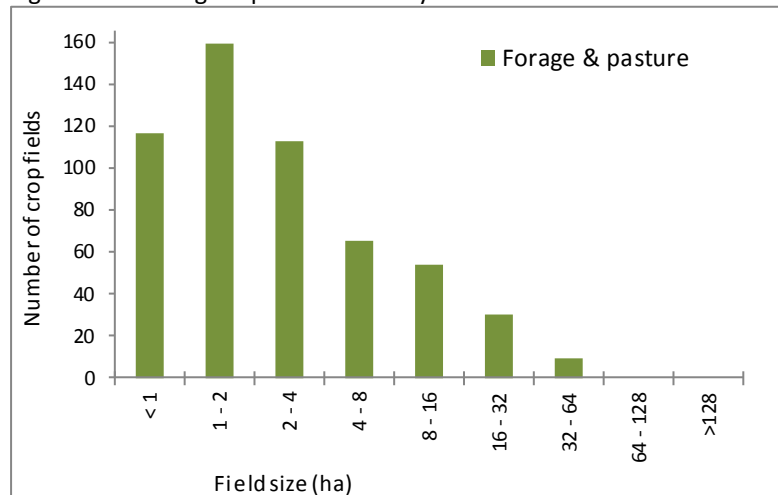


Figure 15 shows that “Forage & pasture” fields are most likely to be less than 4 hectares.

In Surrey, there are 546 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 8 hectares.

Refer to Table A2 in Appendix A for more information.

Figure 16. Forage & pasture fields by size and type

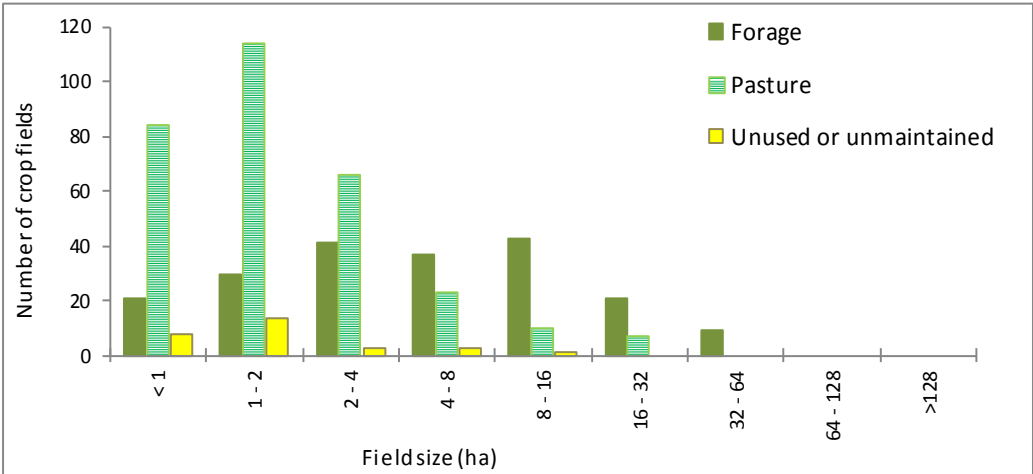


Figure 16 illustrates that both forage and pasture fields occur on all field sizes less than 32 hectares.

There are 193 forage fields with an average area of 9 hectares, median area of 5 hectares, and an average parcel size of 11 hectares.

By comparison, there are 304 pasture fields with an average area of 3 hectares, median area of 2 hectares, and an average parcel size of 5 hectares.

Even though there are more pasture than forage fields, forage fields comprise a larger total area. Forage fields are generally larger than pastures mainly due to harvesting equipment requirements and fencing costs.

Refer to Table A2 in Appendix A for more information.

Berry crops

Berries are primarily perennial crops. 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			
Blueberries	Mature	880	9%	8	888	18%
	Young	481	5%	< 1	481	10%
	Unmaintained	18	< 1%	< 1	18	< 1%
	Subtotal	1,379	15%	8	1,387	28%
Raspberries	Mature	11	< 1%	-	11	< 1%
	Subtotal	11	< 1%	-	11	< 1%
Cranberries	Mature	10	< 1%	-	10	< 1%
	Subtotal	10	< 1%	-	10	< 1%
Strawberries	Mature	4	< 1%	-	4	< 1%
	Young	1	< 1%	-	1	< 1%
	Subtotal	5	< 1%	-	5	< 1%
Blackberries	Mature	1	< 1%	-	1	< 1%
	Subtotal	1	< 1%	-	1	< 1%
Mixed berries	Mature	< 1	< 1%	-	< 1	< 1%
	Subtotal	< 1	< 1%	-	< 1	< 1%
TOTAL		1,407	15%	8	1,416	29%

Table 9 shows that Surrey has a total of 1,416 hectares in berry crops, of which nearly all (98%) are blueberries.

Refer to Map B9 in Appendix B for more information.

Figure 17. Berry fields by size

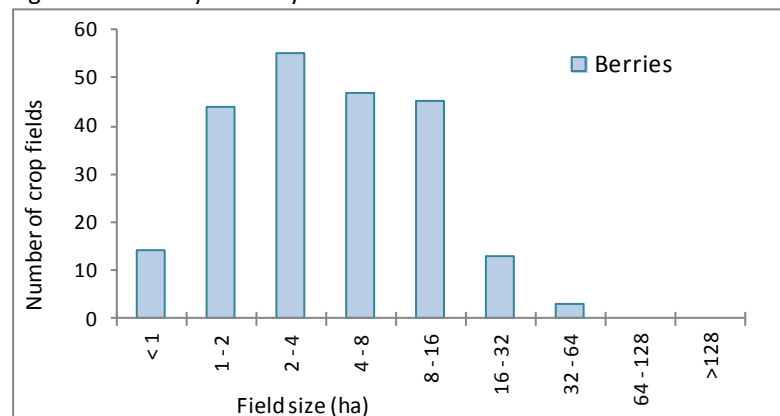


Figure 17 shows that berry fields are a variety of sizes.

In Surrey, there are 221 individual berry fields with an average area of 6 hectares and a median area of 4 hectares.

The average parcel size where berry crops occur is 8 hectares.

Refer to Table A3 in Appendix A for more information.

Figure 18. Blueberry, raspberry, cranberry and strawberry fields by size

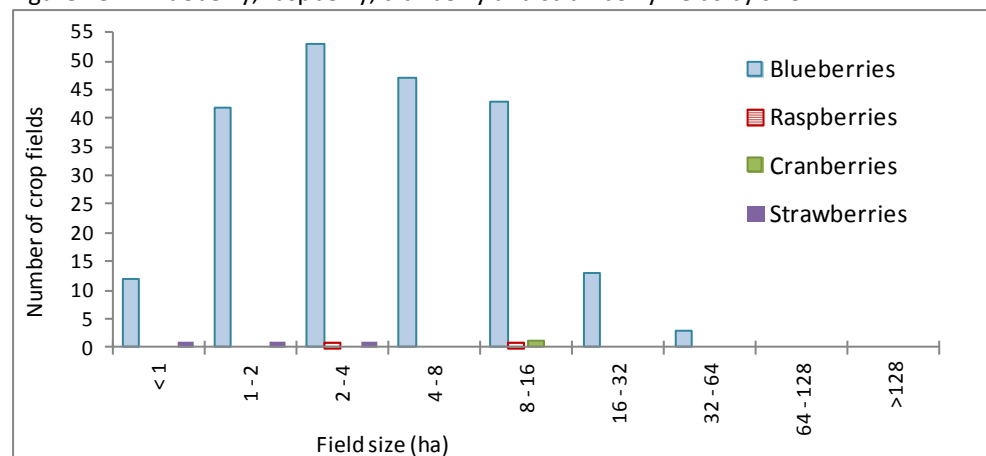


Figure 18 shows that blueberries make up the majority of all berry crops in Surrey.

There are 213 blueberry fields with an average crop area of 7 hectares, median area of 4 hectares, and average parcel size of 8 hectares.

Refer to Table A3 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 Surrey are described by eight crop groupings:

- **Mixed vegetables:** a variety of vegetable types cultivated in a field
- **Cucurbits:** includes squash, cucumber, zucchini, (pumpkins reported separately)
- **Sweet corn**
- **Asian vegetables:** includes bok choy, choy sum, gai choy, sui choy, gai lan, Chinese cabbage, daikon, lotus root
- **Pumpkins**
- **Potatoes**
- **Carrots**
- **Root vegetables - other:** may include garlic, dry onions, rutabagas, turnips, beets, radishes, (potatoes and carrots reported separately)

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	422	5%	12	435	9%
Cucurbits	34	< 1%	-	34	< 1%
Sweet corn	32	< 1%	2	34	< 1%
Asian vegetables	28	< 1%	-	28	< 1%
Pumpkins	22	< 1%	2	25	< 1%
Potatoes	20	< 1%	-	20	< 1%
Carrots	14	< 1%	-	14	< 1%
Root vegetables - other	13	< 1%	-	13	< 1%
TOTAL	585	6%	17	602	12%

Table 10 presents the different vegetable crops in Surrey.

Mixed vegetables are the most common vegetable crop with 435 hectares, or 9% of all cultivated land and 5% of Surrey's ALR.

Refer to Map B10 in Appendix B for more information.

Figure 19. Vegetable fields by size

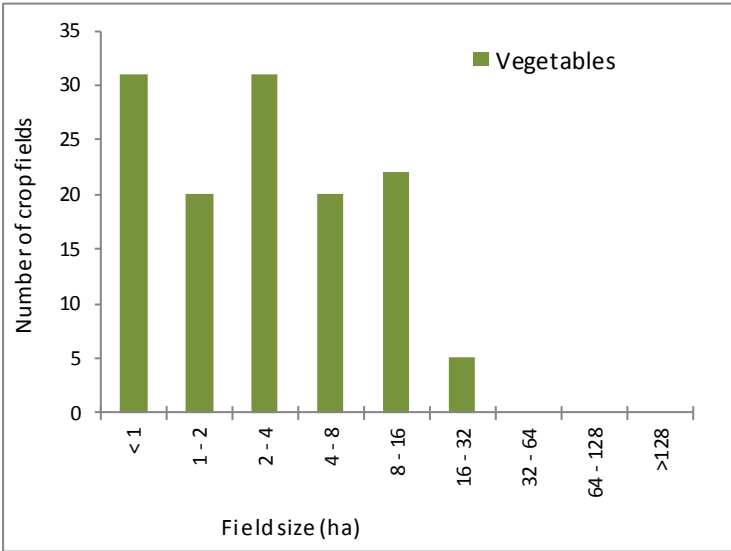


Figure 19 shows that vegetable fields are most likely to be either less than 1 hectare or 2-4 hectares in size.

In Surrey, there are 129 individual vegetable crop fields with an average area of 5 hectares and median area of 3 hectares.

The average parcel size where vegetable fields occur is 9 hectares.

Refer to Table A4 in Appendix A for more information.

Figure 20. Mixed vegetable, cucurbit, sweet corn, and Asian vegetable fields by size

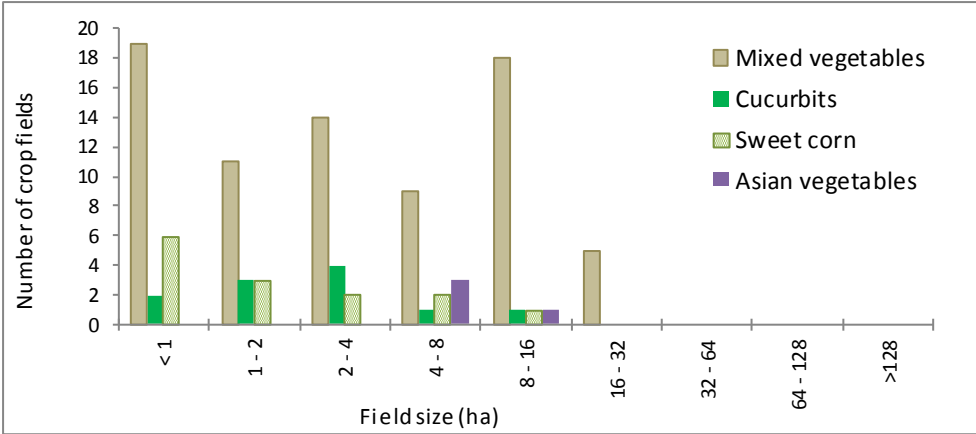


Figure 20 shows that mixed vegetables occur on all field sizes where vegetables are grown. Mixed vegetables are the only vegetable crop with field sizes larger than 16 hectares.

In Surrey, there are 76 individual mixed vegetable fields with an average area of 6 hectares and median area of 4 hectares.

The average parcel size where mixed vegetables occur is 10 hectares.

Refer to Table A4 in Appendix A for more information.

Top 20 Individual Crops

Table 11. Top 20 crop types by area

Cultivated field crop	ALR		Outside ALR (ha)	Total area (ha)	% of cultivated land
	In ALR (ha)	% of ALR			
Forage (managed)	1,540	17%	28	1,569	32%
Blueberries	1,360	15%	8	1,369	28%
Pasture (unmanaged)	371	4%	221	592	12%
Mixed vegetables	422	5%	12	435	9%
Pasture (managed)	185	2%	10	195	4%
Forage (unmanaged)	106	1%	8	114	2%
Nursery	63	< 1%	5	68	1%
Forage & pasture (managed)	63	< 1%	3	66	1%
Forage^	52	< 1%	-	52	1%
Unused forage/pasture	25	< 1%	26	51	1%
Fallow land*	46	< 1%	-	46	< 1%
Barley	35	< 1%	-	35	< 1%
Sweet corn	32	< 1%	2	34	< 1%
Cucurbits	34	< 1%	-	34	< 1%
Oats	31	< 1%	< 1	31	< 1%
Asian vegetables	28	< 1%	-	28	< 1%
Pumpkins	22	< 1%	2	25	< 1%
Ornamentals and shrubs	16	< 1%	9	24	< 1%
Potatoes	20	< 1%	-	20	< 1%
Blueberries (unmaintained)	18	< 1%	< 1	18	< 1%
TOTAL	4,471	48%	335	4,807	97%

^ 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 11 shows the 20 individual crops that account for 97% of the cultivated land in Surrey.

Figure 21. Top 20 crop types by area

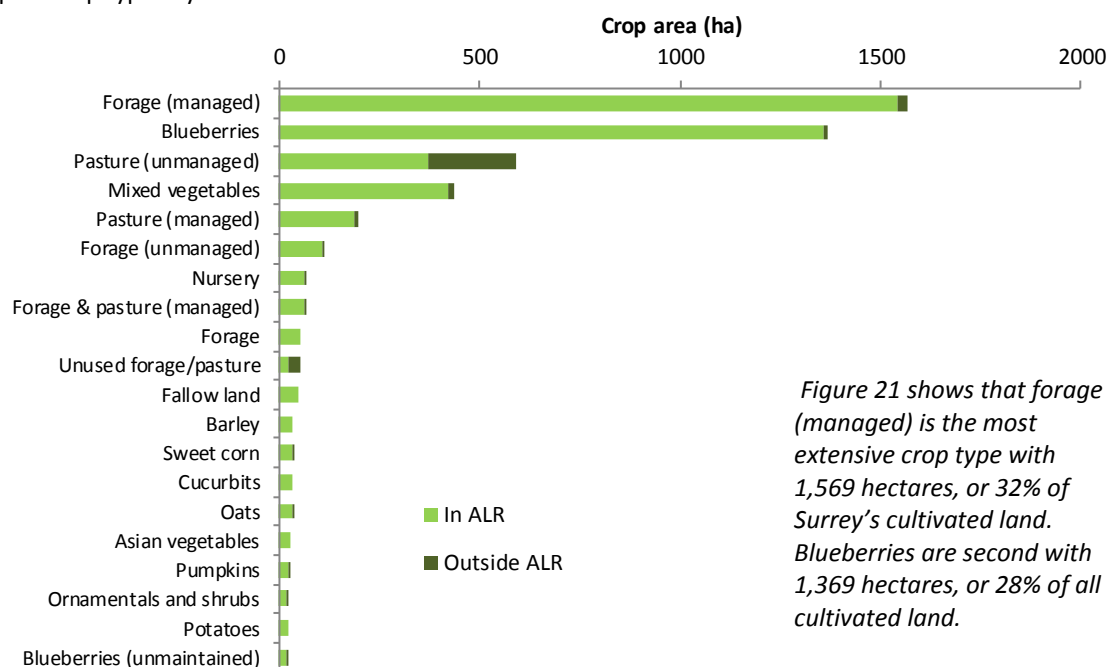


Figure 21 shows that forage (managed) is the most extensive crop type with 1,569 hectares, or 32% of Surrey's cultivated land. Blueberries are second with 1,369 hectares, or 28% of all cultivated land.

GREENHOUSES & CROPS BARNs

Greenhouses are structures covered with translucent material and of sufficient size for a person to work inside⁹. 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 such as mushrooms.

Table 12. Greenhouses and crop barns by area¹⁰

Greenhouses & crop barns		ALR		Outside ALR (ha)	Total area (ha)	% of greenhouse & crop barn area
		In ALR (ha)	% of ALR			
Crop Barn	Mushroom	2	< 1%	< 1	2	3%
Subtotal		2	< 1%	< 1	2	3%
Glass greenhouse	Vegetables	21	< 1%	< 1	22	28%
	Floriculture	15	< 1%	< 1	15	19%
	Nursery	2	< 1%	< 1	2	3%
	Mixed	< 1	< 1%	-	< 1	< 1%
	Unknown - Unmaintained	< 1	< 1%	-	< 1	< 1%
Subtotal		39	< 1%	< 1	40	51%
Poly greenhouse	Nursery	13	< 1%	2	15	20%
	Vegetables	7	< 1%	< 1	8	10%
	Floriculture	4	< 1%	< 1	5	6%
	Unknown	3	< 1%	< 1	4	5%
	Mixed	-	-	< 1	< 1	< 1%
	Unknown - Unmaintained	2	< 1%	2	4	6%
Subtotal		30	< 1%	6	36	46%
TOTAL		71	< 1%	7	78	100%

Table 12 shows that 71 hectares of Surrey's ALR land is covered by greenhouses and crop barns. Sixty-nine of these hectares are covered by greenhouses.

Poly greenhouses make up 30 hectares of ALR land while glass greenhouses make up 39 hectares.

Three crop barns housing mushrooms were reported in Surrey. In total, they comprise 2 hectares of ALR land.

Refer to Map B11 in Appendix B for more information.

⁹ Source: *Guide for Bylaw Development*, 1998 Issue (Working Copy) by Ministry of Agriculture and Food.

¹⁰ 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 22. Distribution of greenhouses and crop barns by building type

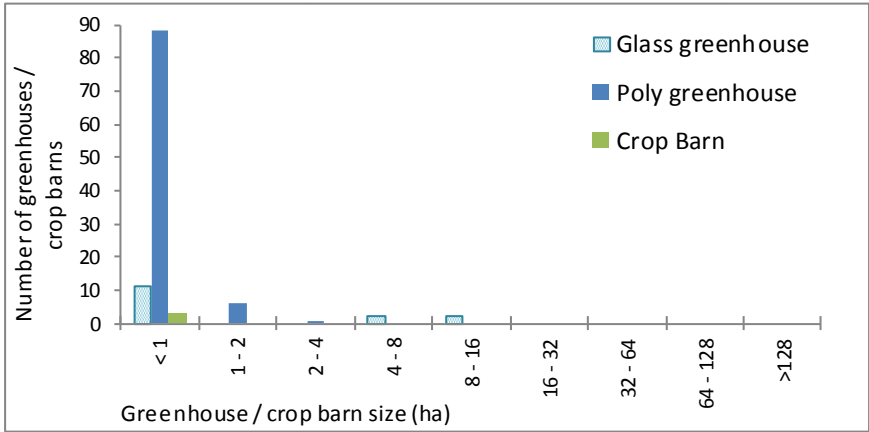


Figure 22 shows that there are significantly more poly greenhouses than glass greenhouses or crop barns in Surrey. Only glass greenhouses are larger than 4 hectares.

Refer to Table A5 in Appendix A for more information.

Figure 23. Distribution of greenhouse and crop barn total area by building type

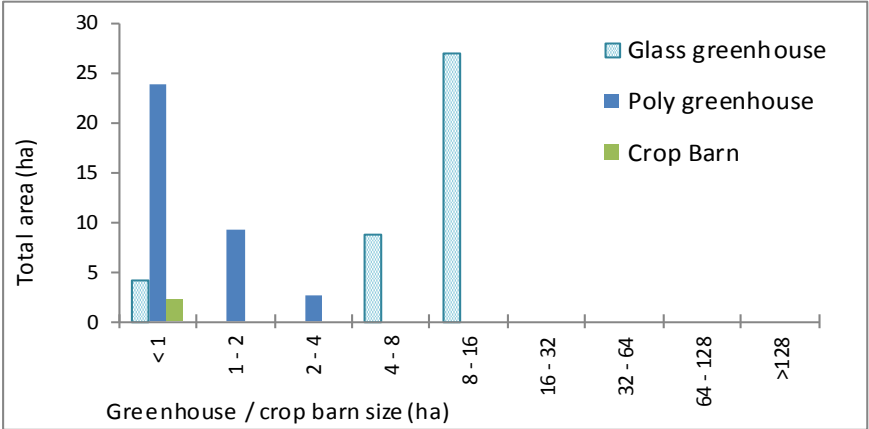


Figure 23 shows that glass greenhouses tend to be larger than poly greenhouses in Surrey.

Refer to Table A5 in Appendix A

Figure 24. Distribution of greenhouses and crop barns by crop type

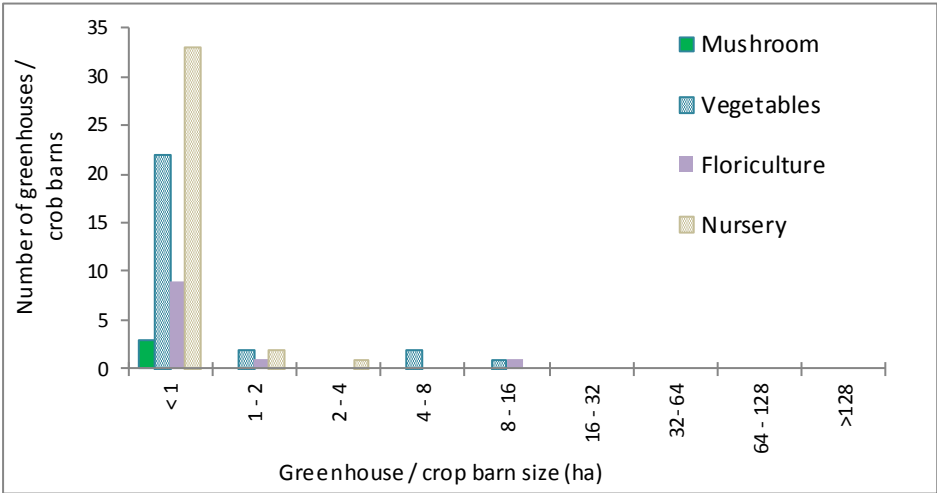


Figure 24 shows that all greenhouses in Surrey are less than 16 hectares and that greenhouses are most frequently less than 1 hectare.

Nursery plants and vegetables are the most common greenhouse crops in Surrey.

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 13. Main crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)				Total area irrigated (ha)	% of crop area irrigated
	Sprinkler	Trickle	Giant gun	Landscape/turf		
Forage & pasture	1,236	-	208	-	1,444	54%
Berries	124	1,054	8	-	1,186	84%
Vegetables	504	2	37	-	543	90%
Nursery & tree plantations	98	< 1	4	< 1	103	93%
Cereals	33	-	-	-	33	40%
Specialty	13	-	-	-	13	97%
Other*	10	-	-	-	10	17%
Vines	5	4	-	-	9	94%
Tree fruits	1	-	-	< 1	2	45%
Nut trees	-	-	-	-	-	-
TOTAL FIELD CROP AREA IRRIGATED	2,025	1,061	256	1	3,344	100%
Greenhouses and crop barns	Mix of flood and trickle irrigation				58	100%

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

Table 13 illustrates that 54% of all forage & pasture crops and 84% of all berry crops are irrigated. Trickle systems are reported primarily on berry fields while sprinkler systems are found on all main crop types except for nut trees.

Refer to Map B12 in Appendix B for more information.

Figure 25. Irrigation systems by percentage of cultivated land

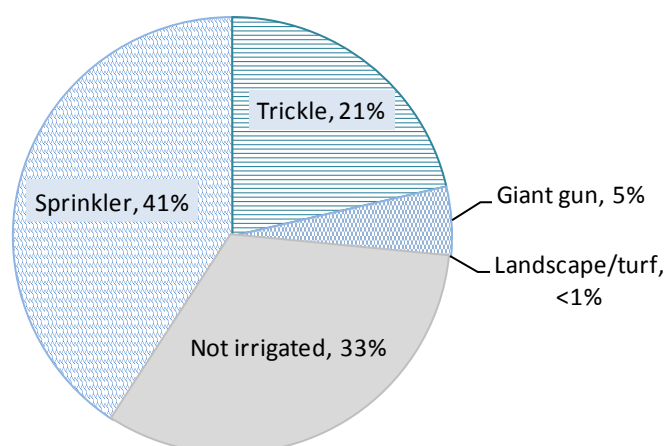


Figure 25 shows that sprinkler irrigation is the most widely used system in Surrey, occurring on 41% of all cultivated land. Trickle systems are the second most common with 21% and giant gun systems are third at 5%.

Sixty-seven percent (67%) of all cultivated land in Surrey is irrigated.

Table 14. Top 20 field crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)				Total area irrigated (ha)	% crop area irrigated
	Sprinkler	Trickle	Giant gun	Landscape/turf		
Forage (managed)	853	-	143	-	996	63%
Blueberries	108	1,050	-	-	1,158	85%
Pasture (unmanaged)	174	-	-	-	174	29%
Mixed vegetables	376	-	24	-	400	92%
Pasture (managed)	83	-	58	-	141	72%
Forage (unmanaged)	77	-	-	-	77	67%
Nursery	67	< 1	-	-	68	100%
Forage & pasture (managed)	31	-	-	-	31	47%
Forage^	6	-	6	-	13	24%
Unused forage/pasture	6	-	-	-	6	13%
Fallow land*	4	-	-	-	4	10%
Barley	-	-	-	-	-	-
Sweet corn	21	-	9	-	30	89%
Cucurbits	19	-	4	-	23	67%
Oats	31	-	-	-	31	99%
Asian vegetables	21	-	-	-	21	76%
Pumpkins	20	2	-	-	22	91%
Ornamentals and shrubs	24	-	-	< 1	24	100%
Potatoes	20	-	-	-	20	100%
Blueberries (Unmaintained)	-	-	-	-	-	-
TOTAL	1,943	1,053	244	< 1	3,241	

^ 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 14 outlines the type of irrigation systems used on the top 20 field crops in Surrey. Sprinkler systems are the most commonly used irrigation system occurring on nearly all crop types. Trickle systems are found almost exclusively on blueberry crops.

LIVESTOCK

Livestock activities are very difficult to measure using a windshield survey method. Livestock are often confined in 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 15. Livestock activities

Livestock group	Livestock detail *	By parcel		Total activities	By activity type	
		Main type	Secondary type		Intensive	Non Intensive
Beef	Beef total	30	3	33	2	31
Dairy	Dairy total	16	1	17	12	5
Poultry	Chicken	41	4	45	25	20
	Chicken (Duck)	-	1	1	-	1
	Chicken (Goose)	1	-	1	-	1
	Turkey	8	-	8	8	-
	Duck	1	-	1	-	1
	Goose	1	-	1	-	1
	Poultry total	52	5	57	33	24
Sheep / lamb / goat	Sheep / lamb	11	1	12	-	12
	Goat	7	2	9	-	9
	Goat (Dairy)	1	-	1	-	1
	Sheep / lamb (Llama)	2	-	2	-	2
	Sheep / lamb / goat total	21	3	24	-	24
Llama / alpaca	Llama / alpaca total	13	-	13	-	13
Specialty livestock**	Specialty livestock total	-	1	1	-	1
Inactive	Inactive total	8	-	8	8	-
Equine	Horse	90	3	93	-	93
	Horse (Pony)	2	-	2	-	2
	Horse (Donkey, ass)	3	-	3	-	3
	Pony	1	1	2	-	2
	Donkey, ass	2	-	2	-	2
	Equine total	98	4	102	-	102
TOTAL		238	17	255	55	200

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

** Specialty livestock in Surrey consists of game birds

Table 15 shows that equine are the most common type of livestock activity in Surrey accounting for 102 or 40% of all livestock activities. Poultry is the second most common with 57 activities or 22% and beef is third with 33 activities or 13%.

There are intensive beef, dairy, and poultry activities in Surrey.

Eight activities were recorded as inactive operations; three (3) were former poultry operations and 5 were former cattle (beef or dairy) operations.

Refer to Maps B13, B14, B15 and B16 in Appendix B for more information.

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

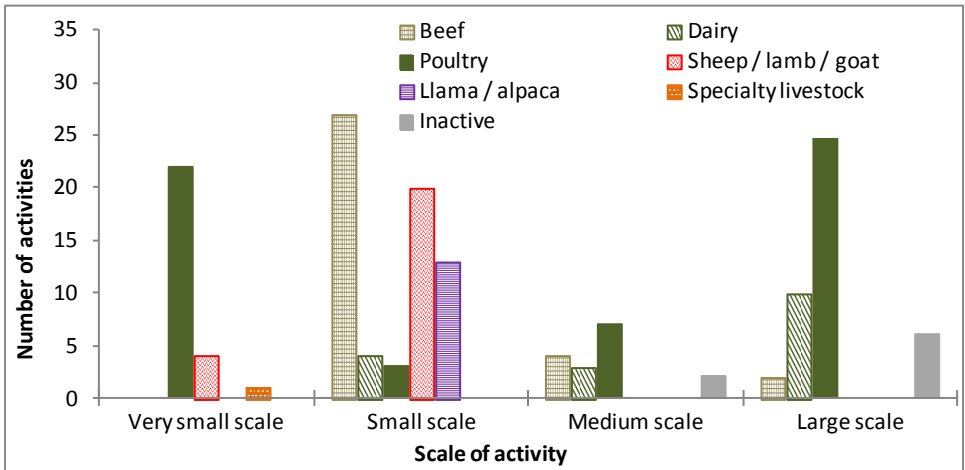


Figure 26 illustrates the scale of livestock activities (excluding equine) in Surrey.

Poultry activities occur on all scales while beef and dairy occur on all scales except “very small”.

There are “large” scale beef, dairy and poultry operations in Surrey. Dairy and poultry are supply managed industries.

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

Figure 27. Livestock and equine activities by scale

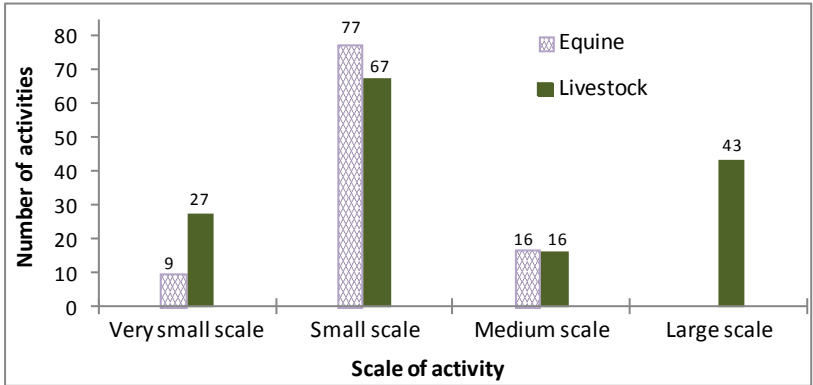


Figure 27 compares the scale of livestock and equine activities.

Even though 102 of the 255 livestock activities are equine, most are “small” scale. There are no “large” scale equine activities in Surrey while there are 43 “large” scale livestock activities.

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

Figure 28. Livestock activities (excluding equine) by parcel size and scale

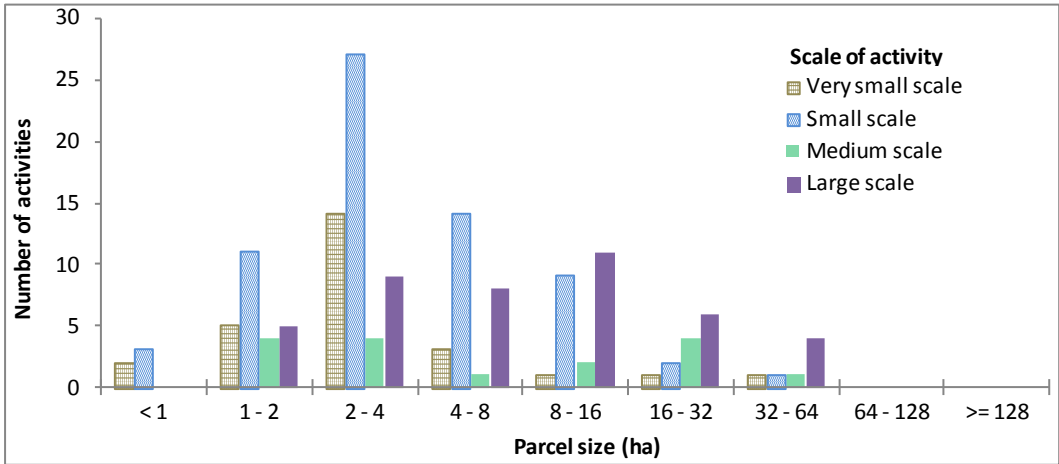


Figure 28 illustrates the distribution of livestock activities (excluding equine) by scale across parcel size categories.

“Large” scale livestock operations occur on a wide range of parcel sizes. All “large” scale activities on parcels less than 8 hectares are poultry. “Small” and “very small” scale activities also occur on larger parcels.

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

Figure 29. Livestock activities (excluding equine) by parcel size and type

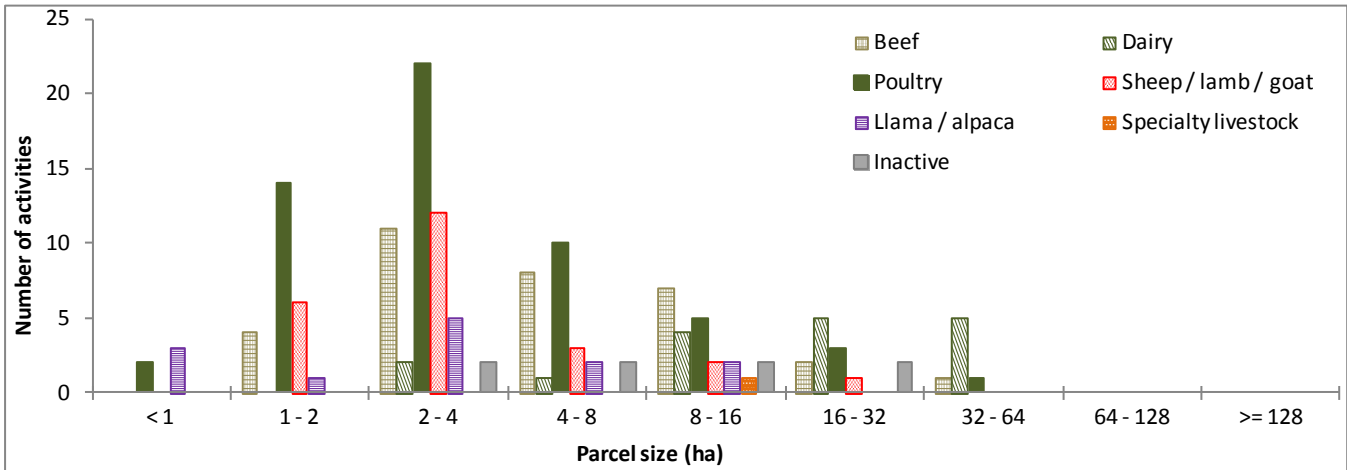


Figure 29 compares the distribution of different livestock types across parcel size categories. Poultry activities occur on all parcel sizes with livestock activities. Beef activities occur on all parcel sizes greater than 1 hectare. Refer to Table A7 in Appendix A for more information.

Figure 30. Livestock and equine activities by parcel size

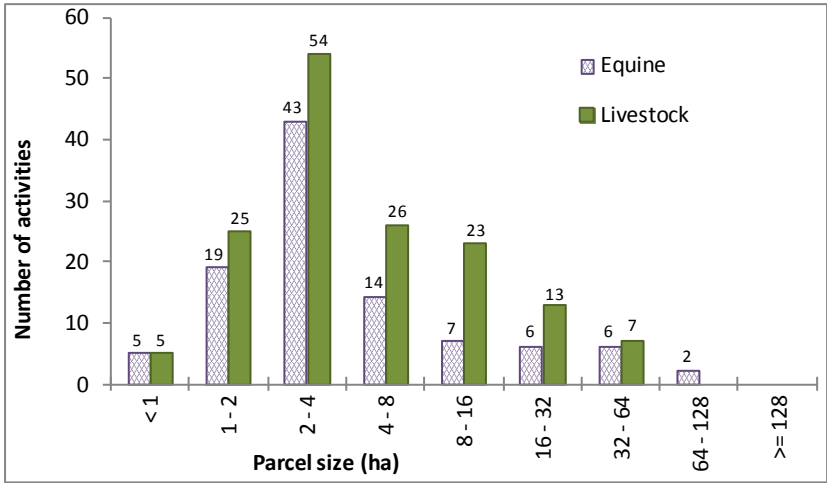


Figure 30 compares the distribution of equine and livestock activities across parcel size categories. The majority of equine activities occur on parcels less than 4 hectares in Surrey. Both livestock and equine activities occur on parcels < 1 hectare while only equine activities occur on parcels greater than 64 hectares. Refer to Table A7 in Appendix A for more information.

Figure 31. Average area in forage, pasture, and farm infrastructure on parcels with livestock activities (excluding very small scale)

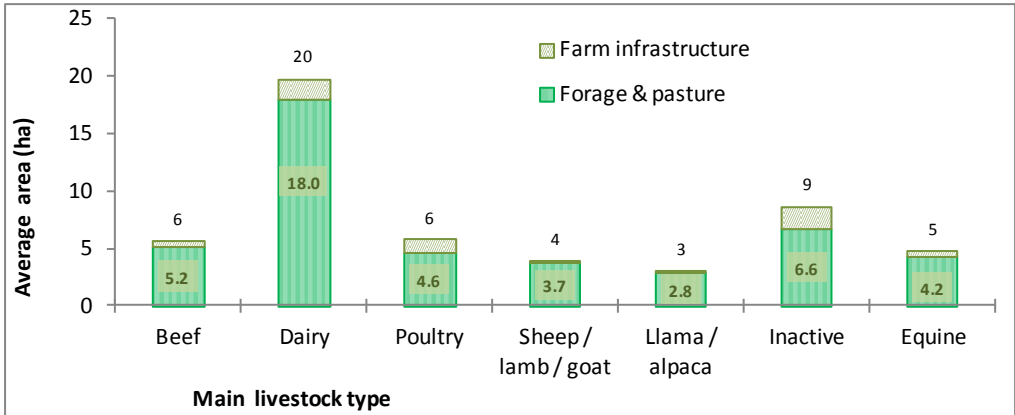
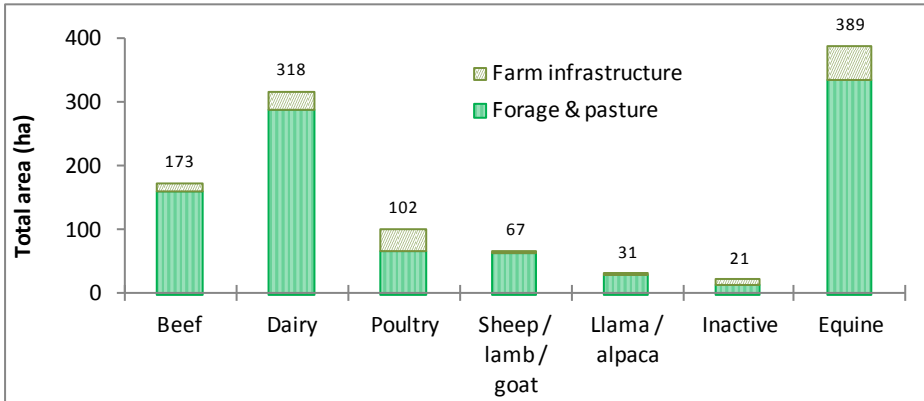


Figure 31 shows that on average a dairy activity is associated with 18 hectares of forage and pasture land which is more than any other type of livestock activity.

Figure 32. 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 other livestock activity (see Figure 31 above), Figure 32 shows that equine activities use a greater total area.

The actual forage area for dairy is often underestimated as 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

Figure 33. Percent of parcel area utilized for forage, pasture, and farm infrastructure on parcels with livestock activities (excluding very small scale)

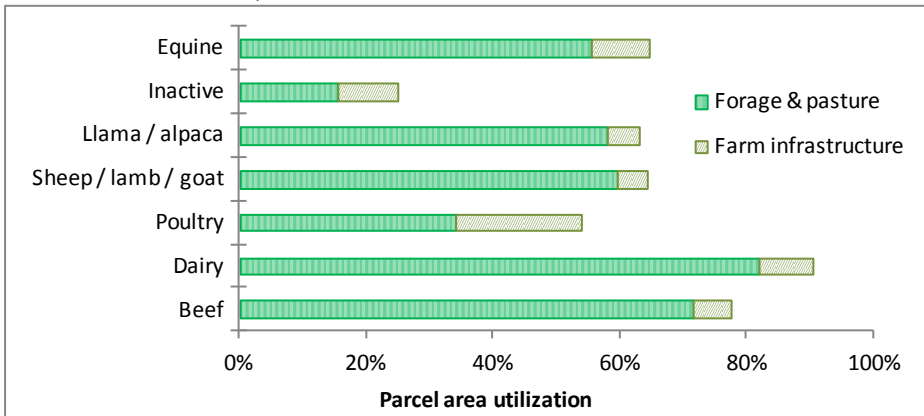
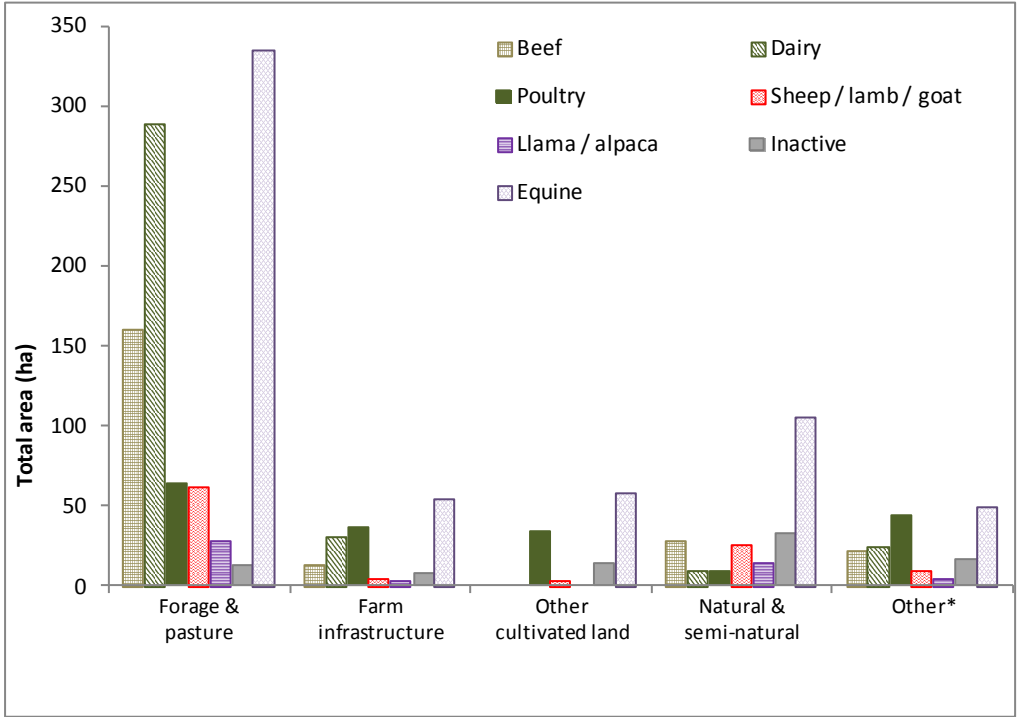


Figure 33 shows that on average a dairy activity in Surrey utilizes 91% of its parcel area for forage, pasture, and farm infrastructure while a poultry activity only utilizes 54%.

Figure 34. 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 34 shows that the land cover associated with dairy, beef, and equine activities is primarily forage and pasture. These operations are growing some of their own feed.

Equine and poultry activities are associated with a greater variety of land cover types which indicates more mixed use parcels.

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

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 farm¹¹ 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 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.

¹¹ On-farm refers to the farm unit which includes all the property belonging to the farm and may incorporate more than one parcel.

Figure 35. Percentage of parcels “Used for farming” with value-added activities

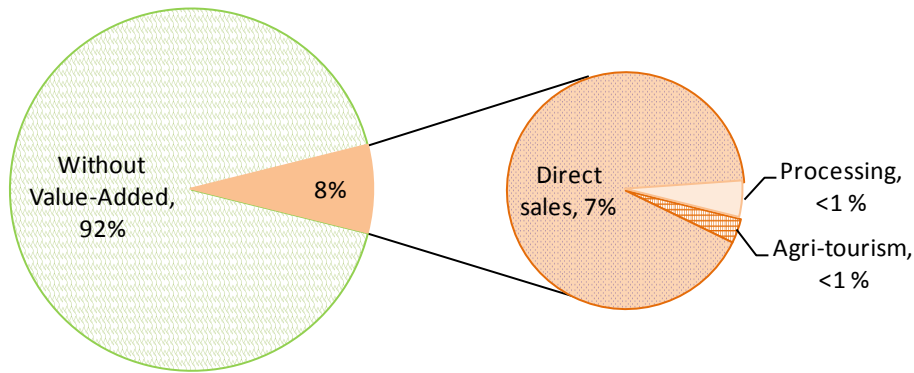
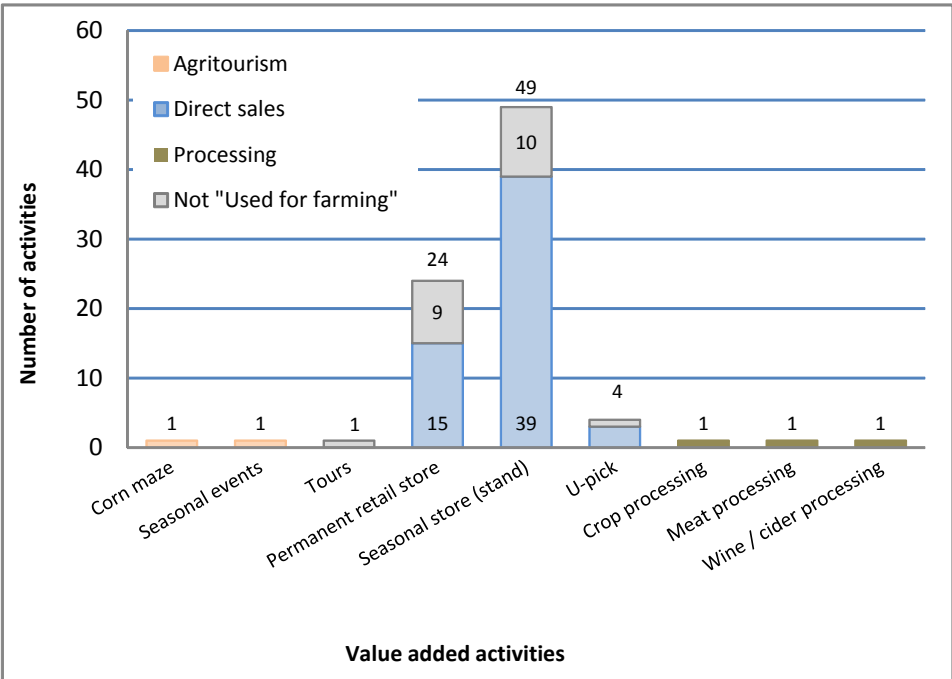


Figure 35. Only 62 or 8% of all parcels “Used for farming” are also being used for value-added activities. Given the close proximity to a large urban population, there are opportunities to increase activities such as agri-tourism and direct sales.

Figure 36. Number of parcels with farming and value-added activities



There are 83 value-added activities located on 80 parcels in Surrey. Twenty-one of these activities on 21 parcels either do not meet the “Used for farming” criteria (refer to the Definition section), or are part of a farm unit where the farming activity occurs on another parcel.

Figure 36 shows that the majority of the value added activities are seasonal stands and permanent retail stores.

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 8,670 hectares of ALR on 1,388 parcels which is 93% of the ALR within Surrey. The remaining 7% 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 Surrey, 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 ($\geq 50\%$) in the ALR, or
- parcels with at least 10 hectares (≥ 10 hectares) of ALR land.

In total, 1,300 parcels, with 8,630 hectares or 92.9% of Surrey's ALR land meets the above criteria and is included in the further analysis of the ALR. This includes 1 parcel that has less than 50% of its area in the ALR but contains more than 10 hectares of ALR land.

Figure 37. Parcel inclusion in the ALR

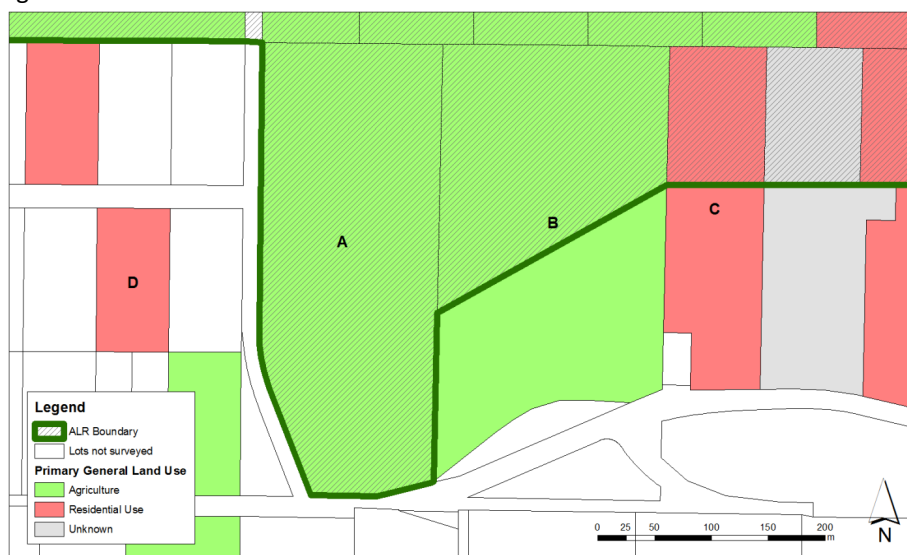


Figure 37 illustrates the distinction between parcels considered to be within or outside the ALR:

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:

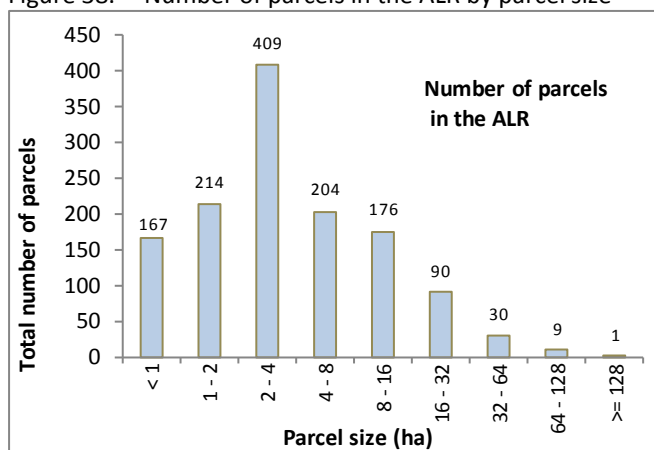
- lot C has less than 50% of its area and less than 10 hectares in the ALR
- lot D is completely outside the ALR.

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 unit¹², 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 38. Number of parcels in the ALR by parcel size



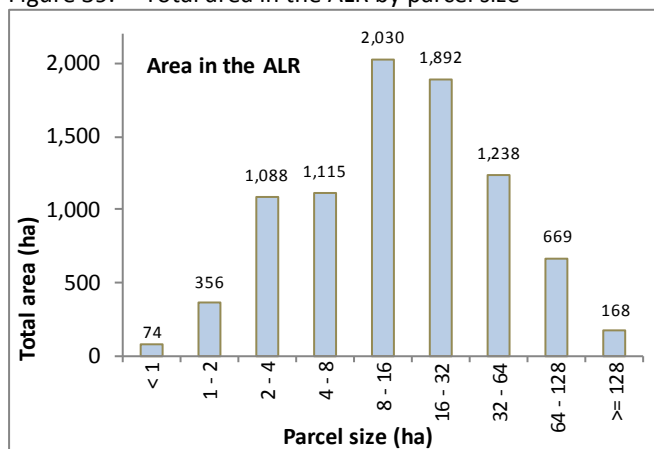
Of Surrey's ALR parcels, 13% are less than one hectare. The average ALR parcel size is 6.6 hectares.

Figure 38 illustrates that of the 1,300 parcels in the ALR:

- 13% (167 parcels) are less than 1 hectare
- 61% (790 parcels) are less than 4 hectares
- 16% (204 parcels) are between 4 and 8 hectares
- 13% (176 parcels) are between 8 and 16 hectares
- 10% (130 parcels) are greater than 16 hectares

Refer to Map B17 in Appendix B for more information.

Figure 39. Total area in the ALR by parcel size



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

Figure 39 illustrates that of the 8,630 hectares in the ALR:

- < 1% (74 hectares) is on parcels less than 1 hectare
- 18% (1,518 hectares) is on parcels less than 4 hectares
- 13% (1,115 hectares) is on parcels between 4 and 8 hectares
- 24% (2,030 hectares) is on parcels between 8 and 16 hectares
- 46% (3,967 hectares) is on parcels greater than 16 hectares

¹²Farm 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 16. 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	629	48 %
Not used for farming	671	52 %
TOTAL	1,300	100 %

Table 16 demonstrates that of the 1,300 parcels in the ALR, only 629 or 48% are "Used for farming".

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

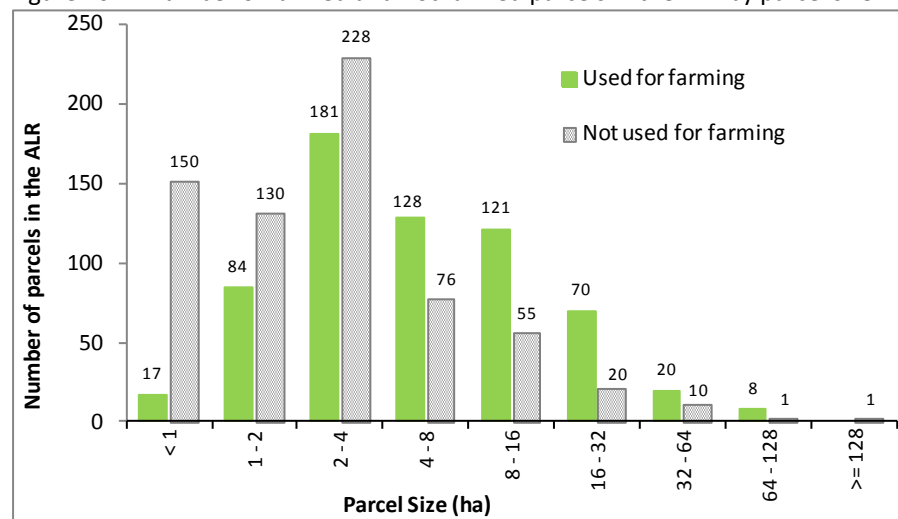


Figure 40 shows that of the 671 or 52% of parcels in the ALR "Not used for farming":

- 150 parcels or 22% are less than one hectare
- 508 parcels or 76% are less than 4 hectares

In parcel size categories greater than 8 hectares, the number of parcels "Used for farming" is generally greater than the number of parcels "Not used for farming". One parcel in the ALR is greater than 128 hectares (168 hectares) and is used for golf.

Figure 41. Number of farmed and not farmed parcels in the ALR by parcel size (line chart)

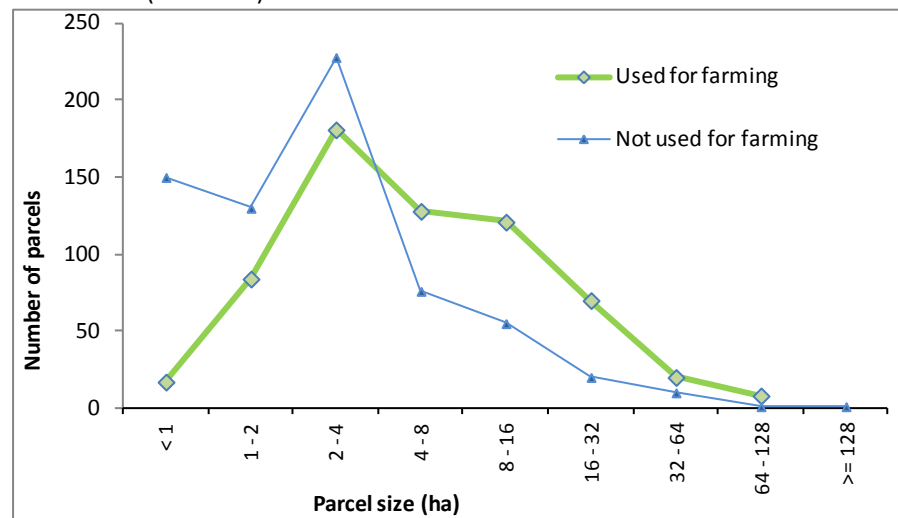


Figure 41 illustrates that although parcels of all sizes are "Used for farming", small parcels are less likely to be farmed.

Figure 42. Proportion of parcels farmed and not farmed by parcel size in the ALR

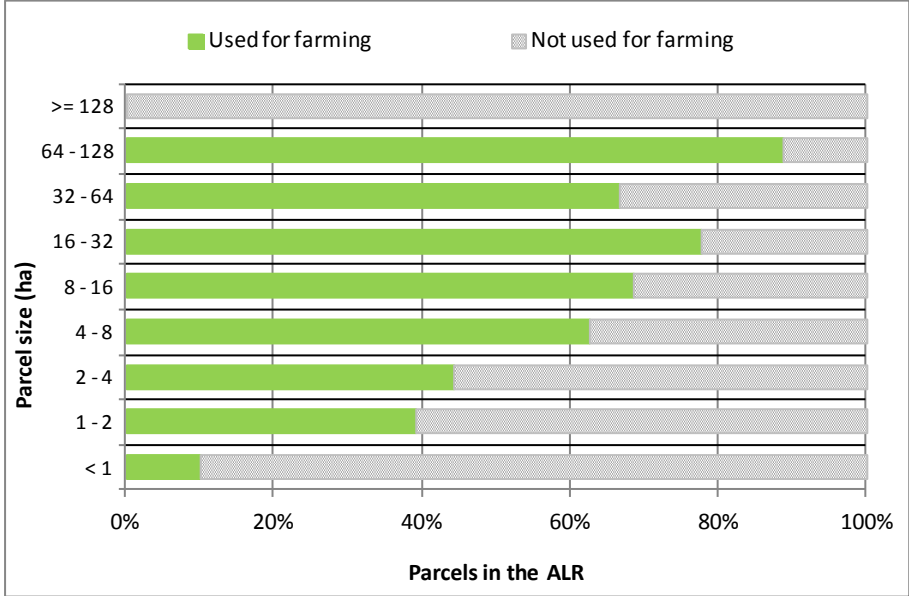
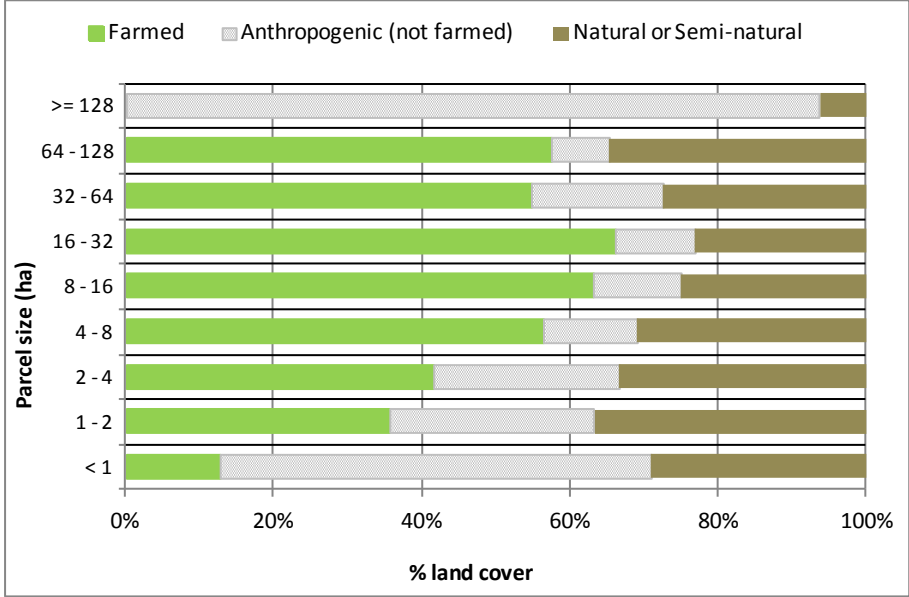


Figure 42 shows that in Surrey, the proportion of parcels being used “Used for farming” increases as the parcel size increases.

Only 10% of parcels that are less than 1 hectare are “Used for farming”.

There is one “Not used for farming” parcel greater than 128 hectares (168 hectares) that is used for golf.

Figure 43. Proportion of land cover by parcel size in the ALR



Similar to Figure 42 above, Figure 43 shows that in Surrey, the proportion of farmed land cover generally increases as the parcel size increases.

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 Surrey properties with residences in the ALR were as follows:

- estate single family house \$627,629
- large single family house \$386,329
- medium single family house \$202,334
- small single family house \$122,187
- single mobile home \$224,631

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

In the following analysis cabins/cottages, mobile homes, single-family houses, duplexes, townhouses, apartments, motels, hotels, 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 17. 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	430	33%	199	15%	629
Not used for farming but available	333	26%	192	15%	525
Not used for farming and unavailable	42	3%	104	8%	146
TOTAL	805	62%	495	38%	1,300

Table 17 shows that 805 parcels or 62% of ALR parcels have residences and that 375 of these parcels are “Not used for farming”.

Table 18. 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	Other**		
Used for farming	27 (9)	271 (203)	156 (145)	45 (41)	30 (30)	2 (2)	531	430
Not used for farming but available	13 (7)	216 (179)	122 (116)	22 (22)	8 (8)	1 (1)	382	333
Not used for farming and unavailable	-	23 (22)	15 (13)	6 (6)	-	1 (1)	45	42
TOTAL RESIDENCES	40	510	293	73	38	-	958	
TOTAL PARCELS	16	404	274	69	38	4		805

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

** Other includes duplexes, townhouses, and dormitory style residences

Table 18 demonstrates that there are 805 parcels in the ALR with 958 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). One third (33%) of all large (3,500 – 5,000 sq. ft.) and estate houses (>5,000 sq. ft.) are on parcels “Not used for farming”.

Figure 44. Total area in residential footprint by parcel size

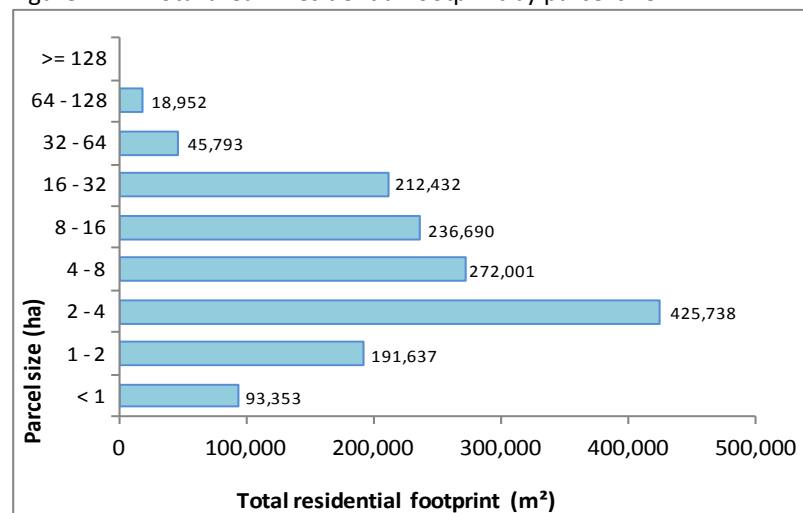


Figure 44 illustrates that there are nearly 150 hectares (1,496,595 m²) of ALR land in residential footprints distributed across all parcel sizes less than 128 hectares.

47% of the total residential footprint area is on parcels less than 4 hectares in size.

Figure 45. Proportion of parcels with residences by parcel size

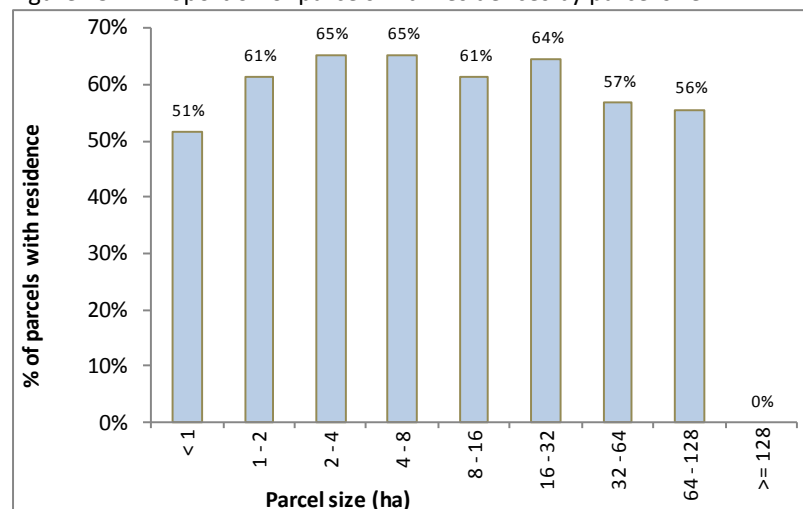


Figure 45 shows that of the 167 parcels in the ALR less than 1 hectare (Figure 38), over half or 51% have a residence.

Figure 46. Average percent of parcel area in residential footprint by parcel size

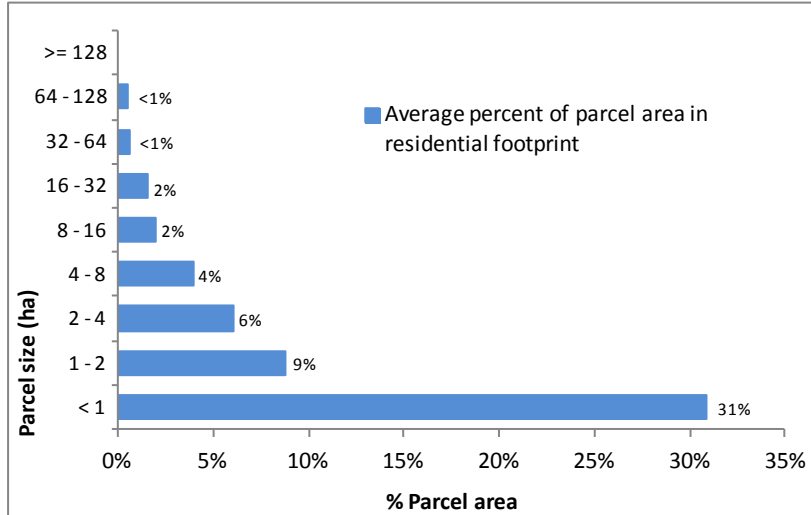


Figure 46 demonstrates that residential footprints on smaller parcels use a much greater proportion of the parcel area than those on larger parcels.

Figure 47. Average total area in residential footprint by parcel size

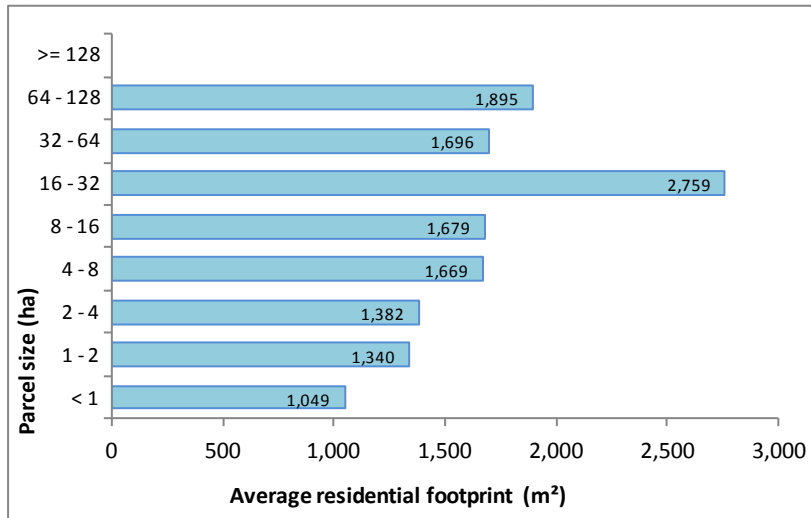
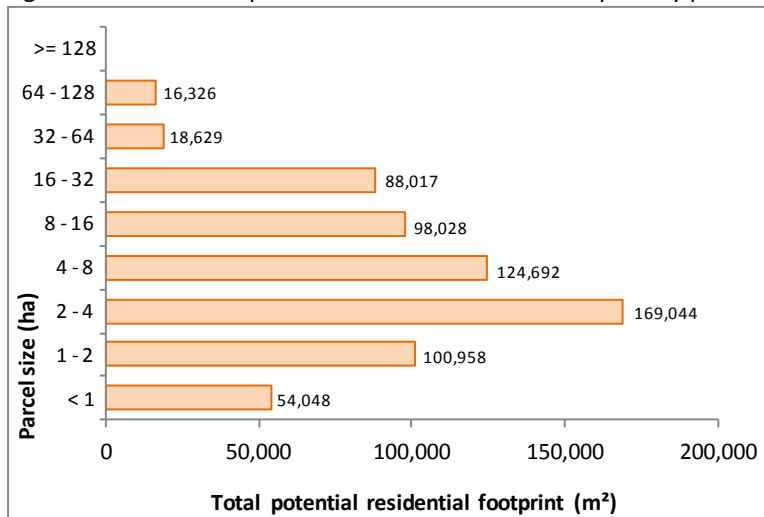


Figure 47 illustrates that even though residential footprints on small parcels use a greater proportion of the parcel area, the average size of the footprint is smaller compared to the footprint on larger parcels.

Figure 48. Total and potential area in residential footprint by parcel size



There are 391 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 17).

If all 391 parcels built a residence, using the average percent of parcel area in residential footprint presented above, Figure 48 shows that an additional 70 hectares (669,741 m²) of ALR land would be permanently removed from potential production.

Table 19. 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	Other*	
Berries	4	53	30	16	22	1	126
Forage & pasture	2	58	41	10	3	-	114
Vegetables	1	31	14	2	2	-	50
Equine	1	18	19	3	1	-	42
Poultry	-	7	10	-	2	-	19
Beef	-	6	6	3	-	-	15
Dairy	-	6	4	3	-	-	13
Nursery & tree plantations	-	5	5	1	-	-	11
Sheep / lamb / goat	-	3	3	1	-	-	7
Inactive livestock	1	3	2	-	-	-	6
Llama / alpaca	-	3	2	1	-	-	6
Glass greenhouse	-	2	2	-	-	1	5
Other*	-	1	2	1	-	-	4
Poly greenhouse	-	3	1	-	-	-	4
Cereals	-	2	1	-	-	-	3
Mushroom	-	2	-	-	-	-	2
Farm	-	-	1	-	-	-	1
Specialty	-	-	1	-	-	-	1
Vines	-	-	1	-	-	-	1
TOTAL PARCELS	9	203	145	41	30	2	430

*Other includes a dormitory style residence and a duplex.

There are 430 parcels with residences that are "Used for farming" (refer to Table 18).

Table 19 shows that "large" or "estate" houses occur most frequently on parcels with berries or forage & pasture as the main agricultural activity.

Table 20. 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	38	254	78 %	8
Forage & pasture	13	92	74 %	9
Vegetables	4	48	81 %	15
Equine	4	8	45 %	5
Dairy	3	67	83 %	26
Beef	3	26	87 %	10
Poultry	2	4	58 %	3
Sheep / lamb / goat	1	5	71 %	7
Other	1	45	69 %	65
Nursery & Tree plantations	1	2	75 %	2
Llama / alpaca	1	1	49 %	3
TOTAL	71	552		

Table 20 illustrates that there are 71 parcels with "large" or "estate" residences in the ALR that are "Used for farming". Of these parcels, 38 or 54% are associated with 254 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
	Forage & pasture	Berries	Vegetables	Nursery & tree plantations	Cereals	Other*	Specialty	Vines	Tree fruits	Nut trees	
< 1	97	14	23	30	1	6	1	4	9	1	186
1 - 2	153	43	15	17	3	4	-	2	-	-	237
2 - 4	102	53	29	4	-	1	-	1	-	-	190
4 - 8	53	48	19	2	1	4	1	-	-	-	128
8 - 16	53	45	21	2	3	-	1	-	-	-	125
16 - 32	29	13	6	1	1	1	-	-	-	-	51
32 - 64	9	3	-	-	-	-	-	-	-	-	12
64 - 128	1	-	-	-	-	-	-	-	-	-	1
>= 128	-	-	-	-	-	-	-	-	-	-	-
TOTAL FIELD COUNT	497	219	113	56	9	16	3	7	9	1	930
AVERAGE CROP AREA (ha)	5 ha	6 ha	5 ha	2 ha	9 ha	4 ha	4 ha	1 ha	< 1 ha	< 1 ha	5 ha
MEDIAN CROP AREA (ha)	2 ha	4 ha	3 ha	< 1 ha	7 ha	2 ha	5 ha	< 1 ha	< 1 ha	< 1 ha	2 ha
AVERAGE PARCEL SIZE (ha)	8 ha	8 ha	9 ha	7 ha	22 ha	10 ha	8 ha	3 ha	3 ha	4 ha	8 ha

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

Table A2. Distribution of forage & pasture fields

Field size (ha)	Number of forage & pasture fields					Total number
	Forage	Pasture	Forage & pasture	Unmaintained*	Unused**	
< 1	21	84	3	-	8	116
1 - 2	30	114	1	-	14	159
2 - 4	41	66	3	-	3	113
4 - 8	37	23	2	-	3	65
8 - 16	43	10	-	1	-	54
16 - 32	21	7	2	-	-	30
32 - 64	9	-	-	-	-	9
64 - 128	-	-	-	-	-	-
>128	-	-	-	-	-	-
TOTAL FIELD COUNT	193	304	11	1	28	546
AVERAGE CROP AREA (ha)	9 ha	3 ha	6 ha	9 ha	2 ha	5 ha
MEDIAN CROP AREA (ha)	5 ha	2 ha	3 ha	9 ha	1 ha	2 ha
AVERAGE PARCEL SIZE (ha)	16 ha	5 ha	11 ha	6 ha	34 ha	8 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.

Table A3. Distribution of berry fields

Field size (ha)	Number of berry fields						Total number
	Blueberries	Raspberries	Cranberries	Strawberries	Blackberries	Mixed berries	
< 1	12	-	-	1	-	1	14
1 - 2	42	-	-	1	1	-	44
2 - 4	53	1	-	1	-	-	55
4 - 8	47	-	-	-	-	-	47
8 - 16	43	1	1	-	-	-	45
16 - 32	13	-	-	-	-	-	13
32 - 64	3	-	-	-	-	-	3
64 - 128	-	-	-	-	-	-	-
>128	-	-	-	-	-	-	-
TOTAL COUNT	213	2	1	3	1	1	221
AVERAGE CROP AREA (ha)	7 ha	6 ha	10 ha	2 ha	1 ha	< 1 ha	6 ha
MEDIAN CROP AREA (ha)	4 ha	6 ha	10 ha	1 ha	1 ha	< 1 ha	4 ha
AVERAGE PARCEL SIZE (ha)	8 ha	14 ha	13 ha	18 ha	8 ha	4 ha	8 ha

Table A4. Distribution of vegetable fields

Field size (ha)	Number of vegetable fields						Carrots	Root vegetables - other	Total Number
	Mixed vegetables	Cucurbits	Sweet corn	Asian vegetables	Pumpkins	Potatoes			
< 1	19	2	6	-	4	-	-	-	31
1 - 2	11	3	3	-	3	-	-	-	20
2 - 4	14	4	2	-	6	1	3	1	31
4 - 8	9	1	2	3	1	1	1	2	20
8 - 16	18	1	1	1	-	1	-	-	22
16 - 32	5	-	-	-	-	-	-	-	5
32 - 64	-	-	-	-	-	-	-	-	-
64 - 128	-	-	-	-	-	-	-	-	-
>128	-	-	-	-	-	-	-	-	-
TOT. COUNT	76	11	14	4	14	3	4	3	129
AVG. CROP AREA (ha)	6 ha	3 ha	2 ha	7 ha	2 ha	7 ha	3 ha	4 ha	5 ha
MEDIAN CROP AREA (ha)	4 ha	3 ha	2 ha	7 ha	2 ha	7 ha	3 ha	5 ha	3 ha
AVG. PARCEL SIZE (ha)	10 ha	13 ha	8 ha	11 ha	8 ha	15 ha	11 ha	13 ha	9 ha

GREENHOUSES & CROP BARNs

Table A5. Distribution of greenhouses and crop barns by building type¹

Greenhouse / crop barn size (ha)	Number of Greenhouses / crop barns			Total number
	Glass greenhouse	Poly greenhouse	Crop Barn	
< 1	11	88	3	102
1 - 2	-	6	-	6
2 - 4	-	1	-	1
4 - 8	2	-	-	2
8 - 16	2	-	-	2
16 - 32	-	-	-	-
32 - 64	-	-	-	-
64 - 128	-	-	-	-
>128	-	-	-	-
TOTAL COUNT	15	95	3	113
AVERAGE AREA (ha)	3 ha	< 1 ha	< 1 ha	< 1 ha
MEDIAN AREA (ha)	< 1 ha	< 1 ha	< 1 ha	< 1 ha
AVERAGE PARCEL SIZE (ha)	12 ha	7 ha	2 ha	7 ha

Table A6. Distribution of greenhouses and crop barns by crop type²

Greenhouse / Crop barn size (ha)	Type of greenhouse / crop barn						Total number
	Mushroom	Vegetables	Floriculture	Nursery	Mixed	Unknown	
< 1	3	22	9	33	4	34	105
1 - 2	-	2	1	2	-	1	6
2 - 4	-	-	-	1	-	-	1
4 - 8	-	2	-	-	-	-	2
8 - 16	-	1	1	-	-	-	2
16 - 32	-	-	-	-	-	-	-
32 - 64	-	-	-	-	-	-	-
64 - 128	-	-	-	-	-	-	-
>128	-	-	-	-	-	-	-
TOTAL COUNT	3	27	11	36	4	35	116
AVERAGE AREA (ha)	< 1 ha	1 ha	2 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)	2 ha	11 ha	10 ha	7 ha	3 ha	8 ha	7 ha

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

² Each distinct greenhouse type on one parcel is counted as one greenhouse activity. Each greenhouse activity will include at least one and perhaps more greenhouse structures. A parcel may have more than one greenhouse activity if there is more than one distinct type of greenhouse on that parcel.

LIVESTOCK

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	Specialty livestock*	Inactive	Equine	
< 1	-	-	2	-	3	-	-	5	10
1 - 2	4	-	14	6	1	-	-	19	44
2 - 4	11	2	22	12	5	-	2	43	97
4 - 8	8	1	10	3	2	-	2	14	40
8 - 16	7	4	5	2	2	1	2	7	30
16 - 32	2	5	3	1	-	-	2	6	19
32 - 64	1	5	1	-	-	-	-	6	13
64 - 128	-	-	-	-	-	-	-	2	1
>= 128	-	-	-	-	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	33	17	57	24	13	1	8	102	254
MEDIAN PARCEL SIZE (ha)	4 ha	24 ha	2 ha	2 ha	2 ha	14 ha	9 ha	3 ha	4 ha
AVERAGE PARCEL SIZE (ha)	8 ha	23 ha	5 ha	5 ha	4 ha	14 ha	11 ha	9 ha	8 ha

*Specialty livestock in Surrey consists of game birds.

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)	24	3	27	-	27
Medium scale (25-100 cattle)	4	-	4	-	4
Large scale (> 100 cattle)	2	-	2	2	-
TOTAL	30	3	33	2	31

"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 - 2	-	4	-	-	4
2 - 4	-	10	1	-	11
4 - 8	-	7	1	-	8
8 - 16	-	4	1	2	7
16 - 32	-	1	1	-	2
32 - 64	-	1	-	-	1
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	-	27	4	2	33
AVERAGE PARCEL SIZE (ha)	-	7 ha	10 ha	10 ha	8 ha

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

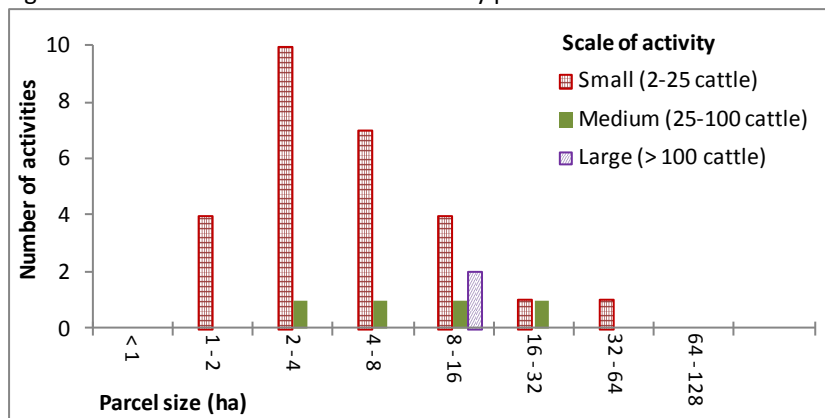
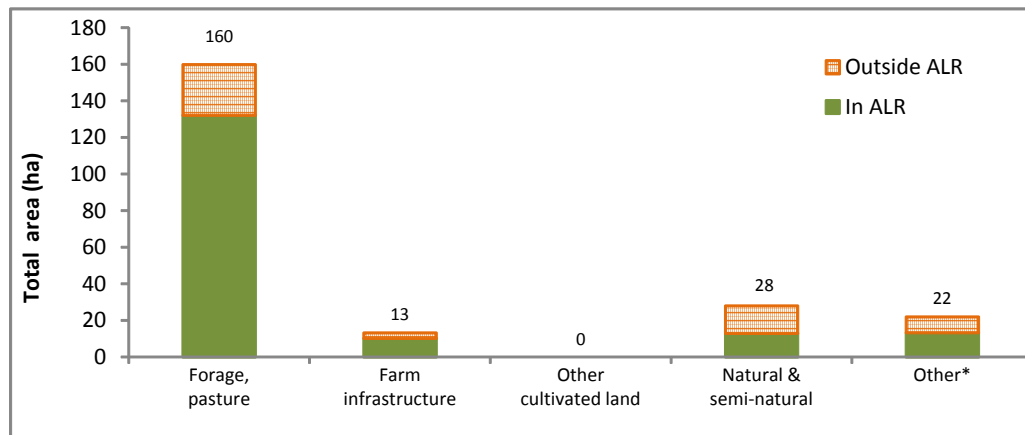


Figure A2. Land cover on parcels with beef activities



* 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)	2	1	3	-	3
Small scale - Dry cow - (2 -25 cattle)	1	-	1	-	1
Medium scale (25 -100 cattle)	3	-	3	3	-
Large scale (> 100 cattle)	10	-	10	10	-
TOTAL	16	1	17	13	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 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 - 2	-	-	-	-	-
2 - 4	-	2	-	-	2
4 - 8	-	1	-	-	1
8 - 16	-	1	-	3	4
16 - 32	-	-	1	4	5
32 - 64	-	-	1	4	5
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	-	4	2	11	17
AVERAGE PARCEL SIZE (ha)	-	5 ha	31 ha	28 ha	23 ha

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

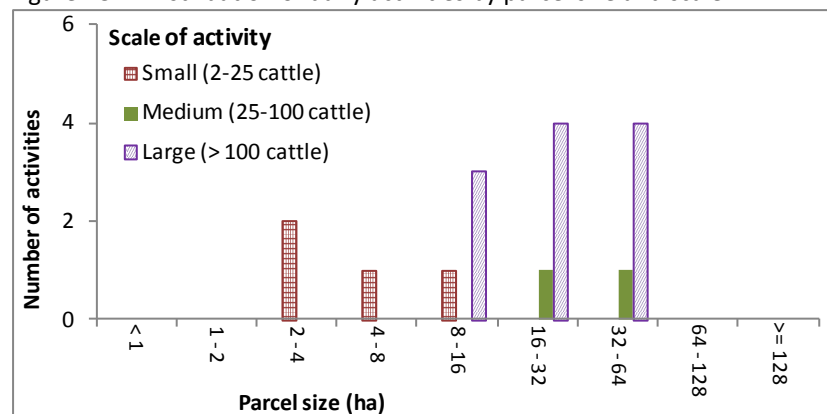
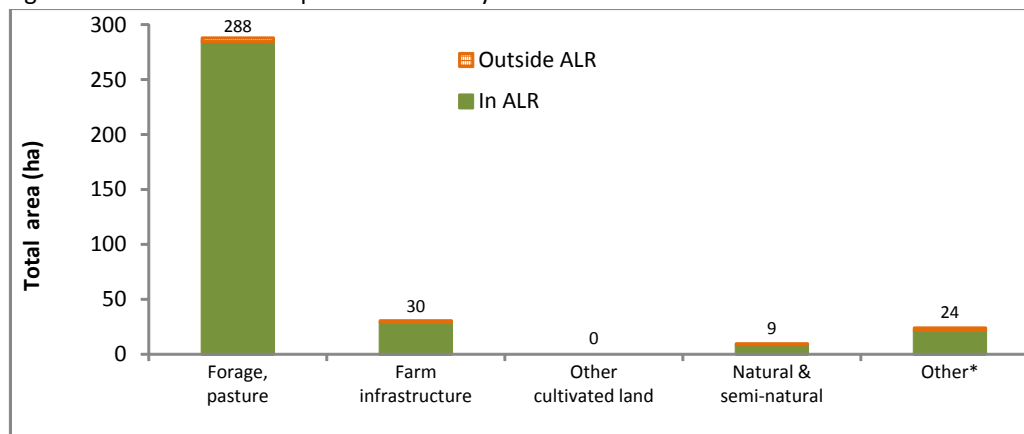


Figure A4. Land cover on parcels with dairy activities



* 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)	11	3	14	1	13
Chicken (broiler/layer)	Very small scale (< 100 birds)	1	-	1	-	1
Chicken (layer)	Very small scale (< 100 birds)	5	1	6	-	6
Chicken	Small scale (100 - 2,500 birds)	2	-	2	1	1
Chicken (broiler)	Medium scale (2,500 - 10,000 birds)	5	1	6	6	-
Chicken (layer)	Medium scale (2,500 - 10,000 birds)	1	-	1	-	1
Chicken	Large scale (> 10,000 birds)	3	-	3	3	-
Chicken (broiler)	Large scale (> 10,000 birds)	13	-	13	13	-
Chicken (layer)	Large scale (> 10,000 birds)	1	-	1	1	-
Duck (broiler)	Small scale (50 - 1,250 birds)	1	-	1	-	1
Goose (layer)	Very small scale (< 50 birds)	1	-	1	-	1
Turkey	Large scale (> 5,000 birds)	8	-	8	8	-
TOTAL		52	5	57	33	24

"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	2	-	-	-	2
1 - 2	4	1	4	5	14
2 - 4	11	1	2	8	22
4 - 8	3	1	-	6	10
8 - 16	-	-	1	4	5
16 - 32	1	-	-	2	3
32 - 64	1	-	-	-	1
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	22	3	7	25	57
AVERAGE PARCEL SIZE (ha)	5 ha	3 ha	4 ha	6 ha	5 ha

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

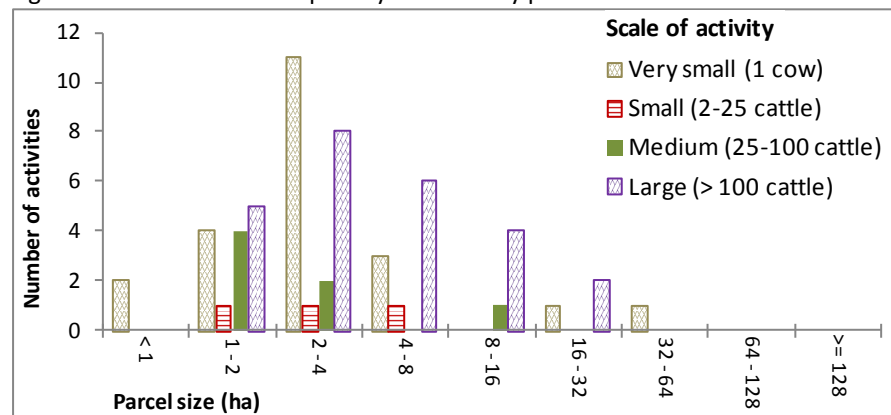
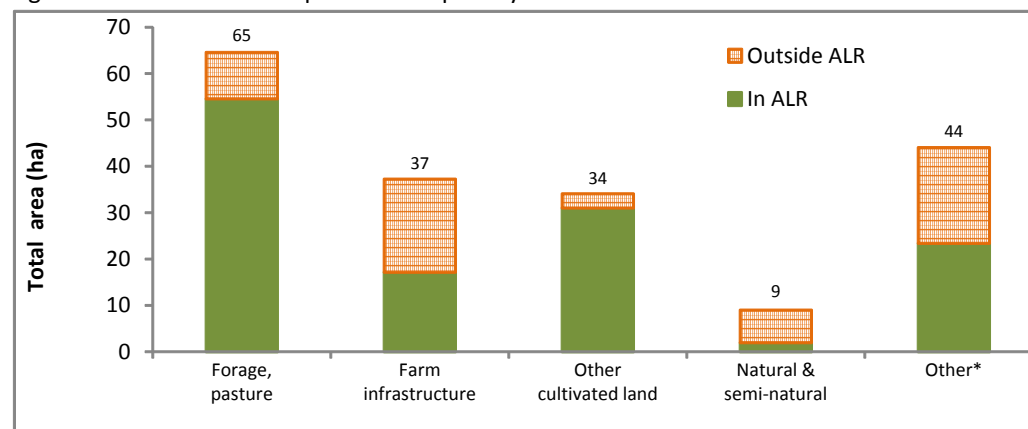


Figure A6. Land cover on parcels with poultry activities



* 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)	2	1	3	-	3
Goat	Small scale (5 - 125 goats)	6	1	7	-	7
Sheep / lamb	Very small scale (< 10 sheep)	1	-	1	-	1
Sheep / lamb	Small scale (10 - 250 sheep)	12	1	13	-	13
TOTAL	TOTAL	21	3	24	-	24

"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 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	1	5	-	-	6
1 - 2	3	9	-	-	12
2 - 4	-	3	-	-	3
4 - 8	-	2	-	-	2
8 - 16	-	1	-	-	1
16 - 32	-	-	-	-	-
32 - 64	-	-	-	-	-
64 - 128	-	-	-	-	-
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	4	20	-	-	24
AVERAGE PARCEL SIZE (ha)	2 ha	5 ha	-	-	5 ha

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

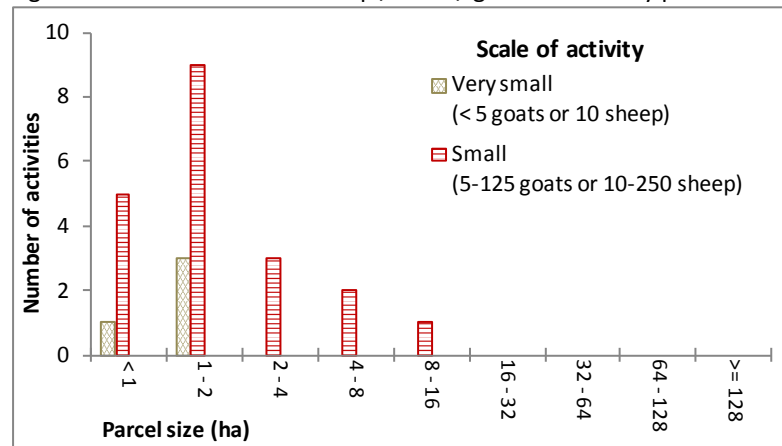
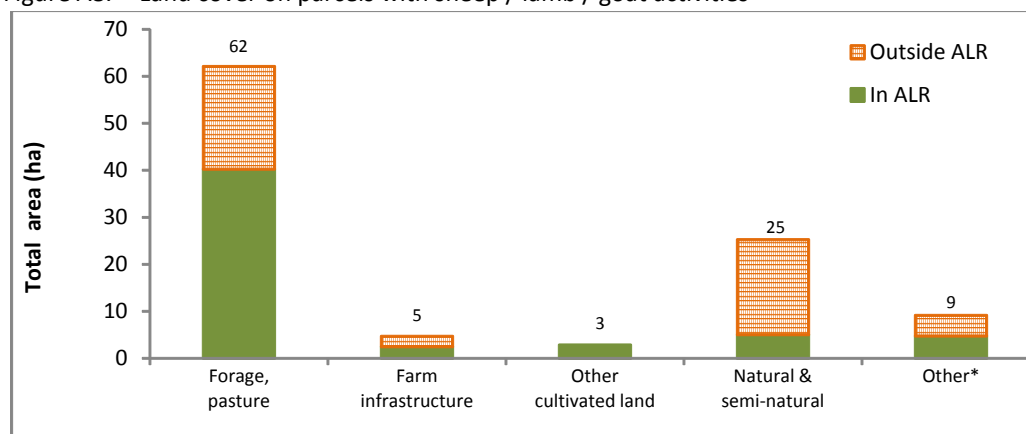


Figure A8. Land cover on parcels with sheep / lamb / goat activities



* 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)	8	1	9	-	9
	Small scale (2-25 horses)	73	3	76	-	76
Boarding	Small scale (2-25 horses)	1	-	1	-	1
	Medium scale (2-25 horses)	13	-	13	-	13
Boarding	Medium scale (2-25 horses)	3	-	3	-	3
TOTAL	TOTAL	98	4	102	-	102

"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	3	-	-	5
1 - 2	2	16	1	-	19
2 - 4	3	34	6	-	43
4 - 8	-	9	5	-	14
8 - 16	-	5	2	-	7
16 - 32	-	4	2	-	6
32 - 64	1	5	-	-	6
64 - 128	1	1	-	-	2
>= 128	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	9	77	16	-	102
AVERAGE PARCEL SIZE (ha)	13 ha	9 ha	7 ha	-	8 ha

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

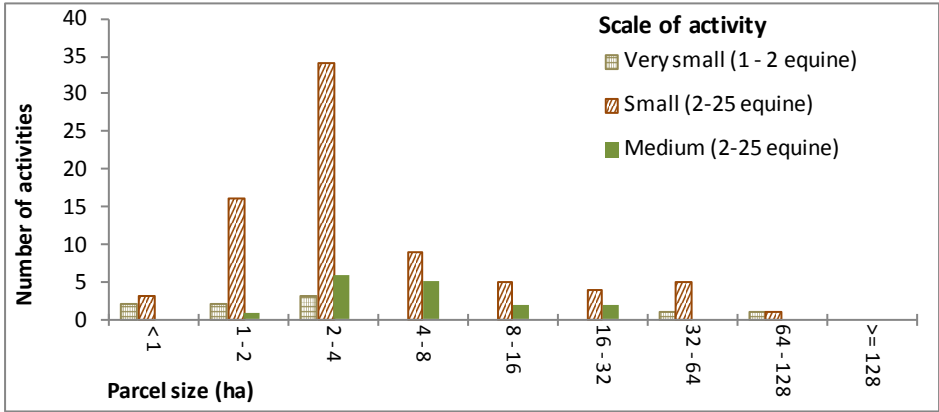
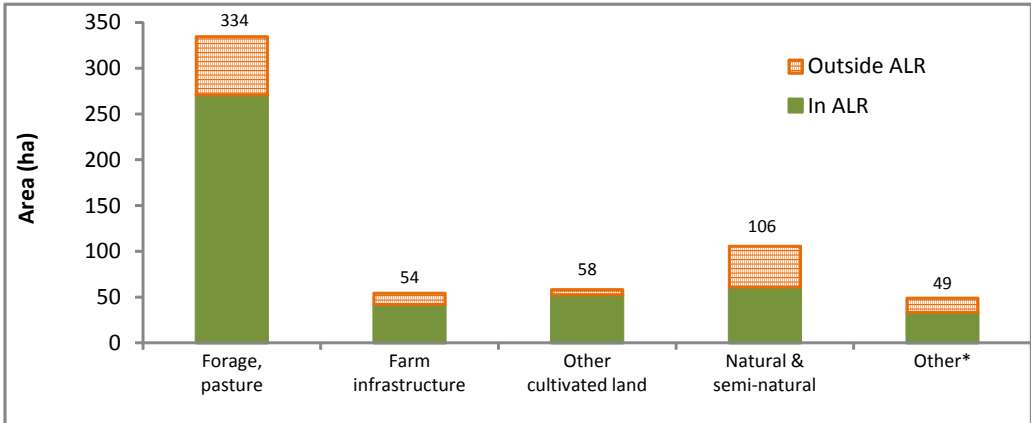


Figure A10. Land cover on parcels with equine activities



* 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	Corn maze	1	-	-	1	27
Agritourism	Seasonal events	1	-	-	1	17
Agritourism	Tours	-	1	-	1	4
Direct sales	Permanent retail store	4	19	1	24	6
Direct sales	Seasonal store (stand)	42	7	-	49	10
Direct sales	U-pick	4	-	-	4	4
Processing	Crop processing	-	1	-	1	15
Processing	Meat processing	-	1	-	1	10
Processing	Wine / cider processing	-	1	-	1	6
TOTAL NUMBER OF ACTIVITIES		52	30	1	83	

Table A19. Distribution of value added activities by parcel size

Parcel size (ha)	Agri-tourism			Direct Sales			Processing			Total number of activities
	Corn maze	Seasonal events	Tours	Permanent retail store	Seasonal store (stand)	U-pick	Crop processing	Meat processing	Wine / cider processing	
< 1	-	-	-	2	1	-	-	-	-	3
1 - 2	-	-	-	1	10	-	-	-	-	11
2 - 4	-	-	1	7	13	3	-	-	-	24
4 - 8	-	-	-	7	8	1	-	-	1	17
8 - 16	-	-	-	6	9	-	1	1	-	17
16 - 32	1	1	-	1	4	-	-	-	-	7
32 - 64	-	-	-	-	3	-	-	-	-	3
64 - 128	-	-	-	-	1	-	-	-	-	1
>= 128	-	-	-	-	-	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	1	1	1	24	49	4	1	1	1	83
AVERAGE PARCEL SIZE (ha)	27 ha	17 ha	4 ha	6 ha	10 ha	4 ha	15 ha	10 ha	6 ha	9 ha

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

Parcel size (ha)	Permanent retail store			Seasonal store (stand)		U-pick	Total number of activities
	Small scale	Medium scale	Large scale	Small scale	Medium scale	Small scale	
< 1	-	2	-	1	-	-	3
1 - 2	-	1	-	9	1	-	11
2 - 4	1	6	-	12	1	3	23
4 - 8	1	5	1	6	2	1	16
8 - 16	1	5	-	8	1	-	15
16 - 32	1	-	-	4	-	-	5
32 - 64	-	-	-	1	2	-	3
64 - 128	-	-	-	1	-	-	1
>= 128	-	-	-	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	4	19	1	42	7	4	77
AVERAGE PARCEL SIZE (ha)	9 ha	5 ha	4 ha	9 ha	15 ha	4 ha	8 ha

Table A21. Distribution of agritourism events by parcel size and scale

Parcel size (ha)	Corn maze	Seasonal events	Tours	Total number of activities
	Small scale	Small scale	Medium Scale	
< 1	-	-	-	-
1 - 2	-	-	-	-
2 - 4	-	-	1	1
4 - 8	-	-	-	-
8 - 16	-	-	-	-
16 - 32	1	1	-	2
32 - 64	-	-	-	-
64 - 128	-	-	-	-
>= 128	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	1	1	1	3
AVERAGE PARCEL SIZE (ha)	27 ha	17 ha	4 ha	16 ha

Table A22. Distribution of processing by parcel size and scale

Parcel size (ha)	Crop processing	Meat processing	Wine / cider processing	Total number of activities
	Medium scale	Medium scale	Medium scale	
< 1	-	-	-	-
1 - 2	-	-	-	-
2 - 4	1	-	-	1
4 - 8	-	-	1	1
8 - 16	-	1	-	1
16 - 32	-	-	-	-
32 - 64	-	-	-	-
64 - 128	-	-	-	-
>= 128	-	-	-	-
TOTAL NUMBER OF ACTIVITIES	1	1	1	3
AVERAGE PARCEL SIZE (ha)	15 ha	10 ha	6 ha	10 ha

Appendix B - Maps