

# *Growing Knowledge*



Ministry of  
Agriculture

*Agricultural Land Use Inventory*

Reference Number: 800.510-40.2014

## **Regional District of North Okanagan Agricultural Land Use Inventory Summer 2013 – 2014**



**Strengthening Farming Program  
British Columbia Ministry of Agriculture**

December 2016

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- Okanagan Basin Water Board (OBWB),
- Partnership for Water Sustainability,
- Regional District of North Okanagan,
- British Columbia Ministry of Agriculture.

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## Acronyms

|      |                                     |
|------|-------------------------------------|
| AGRI | BC Ministry of Agriculture          |
| ALR  | Agricultural Land Reserve           |
| ALUI | Agricultural Land Use Inventory     |
| GIS  | Geographic Information Systems      |
| OCP  | Official Community Plan             |
| RDNO | Regional District of North Okanagan |

## Executive Summary

In the summers of 2013 and 2014, the BC Ministry of Agriculture and its partners conducted an Agricultural Land Use Inventory (ALUI) in the Regional District of North Okanagan. This inventory is part of a larger ALUI project in the Okanagan Basin. Project funding was provided by the Okanagan Basin Water Board and the Regional District of North Okanagan. In-kind contributions were provided by the Partnership for Water Sustainability, BC Ministry of Agriculture, and the Okanagan-Kootenay Sterile Insect Release Program (OKSIR).

ALUIs can be used to understand the type and extent of agricultural activities within the Agricultural Land Reserve (ALR). The ALUI data quantifies how much land is currently used for agriculture, how much land is unavailable for agriculture, and how much land may have potential for agricultural expansion. The data provides baseline information that can be used to track trends in agricultural land use and to measure changes over time. The data also enables the estimation of agricultural water demand with the use of an irrigation water demand model.

### **Highlights in 10 bullets:**

Within RDNO:

- 45% of the effective ALR is in farmed land cover that includes crops, barns and greenhouses.
- There are 23,560 ha of cultivated crops in the ALR and 1,120 ha of crops outside the ALR.
- Forage & pasture is the primary crop that comprises 87% of all cultivated crops in the region.
- Cereal crops are the second most abundant crop that comprises 6% of all cultivated crops (1,444 ha).
- 77% of the crops occur in three jurisdictions: Spallumcheen, Area D, and Area F.
- 59% of all crops utilize irrigation with sprinkler and giant gun systems being the most common
- Beef and equine are the most common types of livestock. Beef have the greatest number of estimated animal unit equivalents (16,250). Equine occur frequently in the region, however, most operations are small and have fewer than 25 animals.
- There are large scale beef, dairy and poultry operations in the region (>100 animal unit equivalents).
- 47% of the ALR parcels are used for farming (2,412 parcels) while 51% are not used for farming (2,706 parcels).
- Of the not used for farming parcels, 1,830 parcels are unavailable for farming due to an existing land use or low availability of suitable land while 876 parcels may be available for farming.

### **Area of Interest and Methodology**

Included in the inventory were all parcels:

- completely or partially within the ALR, or
- classified by BC Assessment as having “Farm” status for tax assessment, or
- containing an active water licence for farming or irrigation purposes, or
- zoned by local government bylaws to permit agriculture, and greater than 1 acre (approximately 0.4 ha) and showing signs of agriculture on aerial photography

The ALR in RDNO consists of 68,888 ha. Of this area:

- 80% or 55,307 ha met one of the inventory criteria and was included in the survey
- 12% or 5,176 ha was outside of legally surveyed parcels in rights-of-way, water, or unsurveyed Crown land
- 8% or 8,405 ha was in Indian reserves

This report focuses on the 80% or 55,307 ha of the ALR that is within legally surveyed parcels and outside of Indian reserves. This 80% is considered the “effective ALR” as local and provincial governments may have an opportunity to influence land use decisions on this area.

The ALUI was conducted using visual interpretation of aerial imagery combined with a drive-by “windshield” survey to capture a snapshot in time of land use and land cover. Land cover is defined as the biophysical material at the surface of the earth while land use is defined as how people utilize the land.

### **Land Cover and Farming Activities**

In the ALR by land cover, 45% of the effective ALR was farmed (25,261 ha), 5% of the effective ALR (2,574 ha) was otherwise anthropogenically modified in vegetation, buildings, and roads, and 50% of the effective ALR (27,472 ha) was in a natural or semi-natural state. An additional 1,310 ha of land outside the ALR was farmed.

Of the farmed land cover in RDNO, 37% occurs in Spallumcheen, 23% occurs in Area D, and 18% occurs in Area F. Spallumcheen has the largest proportion of its ALR area in farmed land cover (69%), followed by Enderby with 62% and Armstrong with 58%. These jurisdictions are best utilizing their ALR for farming purposes.

There are 24,680 ha of cultivated field crops in RDNO in 11 crop categories (23,560 ha in the ALR and 1,120 ha area outside the ALR). Forage & pasture was the most common crop type accounting for 87% of all cultivated land. Cereals & oilseeds were the next most common with 6% of the cultivated land. Spallumcheen has the highest proportion of RDNO’s cultivated crops with 36% followed by Area D with 20% and Area F with 18%.

A total of 21,543 ha of forage crops were recorded in RDNO: 13,883 ha were used for forage (56% of all cultivated crops), 3,468 ha were used for pasture (14% of all cultivated crops), and 4,192 ha were used for both forage and pasture.

A total of 1,448 ha of cereal & oilseed crops were recorded in RDNO. The main crops included wheat with 871 ha, canola with 222 ha and barley with 204 ha. Seventy-two percent (72%) of all cereal & oilseed crops are located within Spallumcheen.

Other crop groups in RDNO include tree fruits (581 ha), nursery (224 ha), tree plantations (219 ha), vegetables (158 ha), vines & berries (72 ha), and 28 ha in turf and specialty crops.

In addition to the cultivated crops, there were 44 ha in greenhouses and crop barns: 17 ha were in poly greenhouses, 23 ha were in glass greenhouses and 4 ha were in crop barns. In total, 84% of the greenhouse and crop barn area was in Spallumcheen.

Irrigation use was captured by crop type and irrigation system type to aid in developing a water demand model for agriculture. In total, 59% of RDNO’s cultivated field crops utilize irrigation. Sprinkler systems (8,652 ha) were the most common and were found on nearly all crop types. Giant gun systems were also common and were found primarily on forage & pasture crops.

### **Livestock**

Livestock activities were recorded, but were difficult to measure using a windshield survey. Livestock may not be visible if they are housed in barns, or are on another 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 were observed. No actual livestock numbers were obtained through the survey, so the results are reported as a range in terms of animal unit equivalents for each parcel.

In the RDNO, beef, equine, poultry and dairy are the most common types of livestock. Sheep / goat activities area also notable. Beef accounts for 38% of the estimated animal unit equivalents (AUEs). Equine accounts for 23% of the AUEs, dairy accounts for 18%, poultry accounts for 12%, and sheep/goats account for 4%. Equines had the greatest number of individual occurrences, however, most equine operations had only a few animals.

Intensive activities utilize specialized structures for confined feeding at higher stocking densities. Most of the dairy (82%) are associated with intensive facilities. Poultry also has a high proportion of its estimated AUEs associated with intensive facilities (76%). In comparison, all equine and 62% of the beef estimated AUEs are considered “non-intensive”.

The majority of the estimated poultry AUEs occur in Spallumcheen (77%), while nearly all of the estimated dairy AUEs occur in 3 jurisdictions: Spallumcheen (44%), Area F (44%), Area D (11%). Both beef and equine estimated AUEs have a broad distribution across RDNO jurisdictions.

### **ALR Utilization**

Land use was applied on a parcel basis. To determine land use, the entire parcel was examined and a “Used for farming” or “Not used for farming” category was assigned based on the percentage of the parcel in cultivated crops, farm infrastructure, and/or the scale of livestock production. Refer to the glossary for the full “**Used for farming**” definition.

In the ALR by land use, 47% of the parcels were “Used for farming” (2,412 parcels), 1% were “Used for grazing” (33 parcels) and 52% of the parcels were “Not used for farming” (2,673 parcels). The average “Used for farming” parcel size was 15 ha while the average “Not used for farming” parcel size was somewhat smaller at 12 ha. There is a significant amount of residential land use in the ALR with 72% of all parcels being used for residential purposes.

### **ALR Availability**

Parcel availability for farming was assessed based on the compatibility and extent of existing land uses and land covers for agriculture. Parcels considered “Not used for farming” were further categorized as available or unavailable for farming. Unavailable for farming parcels have either a land use that makes agricultural development improbable (e.g. golf course, school, etc.) or has little suitable land available for development. Of the ALR parcels:

- 2,412 parcels (47%) are used for farming
- 1,830 parcels (36%) are unavailable for farming
- 876 parcels (17%) are available for farming

A parcel is considered to be available for farming if it is not already “Used for farming” and it has at least 50% of its area and at least 0.4 ha in land that is available for farming. Ownership and cost are not considered when assessing parcel availability. Of the available parcels:

- 326 parcels (37%) are less than 2 ha in size
- 561 parcels (64%) are less than 4 ha in size
- 315 parcels (36%) are greater than 4 ha in size
- 93 parcels (11%) are greater than 16 ha in size

There is evidence that small parcels are less likely than larger parcels to be utilized for farming. In RDNO there are 1,183 ALR parcels less than 1 ha. Of these parcels, 12% (145 parcels) are “Used for farming”, 132 parcels (11%) are “Available for farming”, and 906 (77%) are “Unavailable for farming”. Furthermore, of all parcels considered unavailable for farming, 50% are less than 1 ha in size.

## Agrologist Comments

The rich farming history of the North Okanagan dates back to the gold rush when cattle were driven through the area towards mining towns. Early settlers recognized the abundant grass and accessible water the area had to offer, which led to the development of cattle ranches and planting of orchards. The area consists of good agricultural soil and climatic capability of hot summers and relatively mild winters. These conditions continue to support a diverse array of livestock and crop enterprises, where larger, intensive farms operate alongside small lot agriculture.

The livestock sector plays an important role to agriculture in the North Okanagan, including beef, dairy and poultry production. Cattle ranching is an important farming practice and mainstay in the area; however, over recent years beef production has decreased, while dairy production has become one of prominent agricultural sectors in the region. Forage crops and pasture are therefore of great importance for feeding livestock. More intensive production practices include dairy and poultry, while beef cattle production is mainly extensive and depends on the use of Crown range for grazing purposes. There are also notable equine, sheep and goat operations in the area.

Along with livestock and forage, the area produces a variety of cereals, oilseeds, tree fruits, grapes and horticultural crops. Cereals are grown as livestock feed but also for selling to outside entities, along with oilseeds such as canola. The main tree fruit product is apples. As new varieties of cherries and grapes are developed with hardier and later maturing characteristics, production of these fruits will continue to expand into the North Okanagan. The region has a vibrant organic sector, including market gardens, small-scale fruit producers and grain growers. Horticultural crops include vegetables, nuts, berries, greenhouse, and specialty items.

A strong local economy and tourism with a wide range of local products provide opportunities for continued growth in direct farm marketing and local food sales. The area has active Farmers' Markets, including BC's oldest Farmers' Market located in the City of Armstrong. Farms, orchards and vineyards are becoming more integrated with tourism activities in the region.

The region also supports crop and livestock processing, such as Gambrinus Malting Corporation, Sure Crop Feeds, Rogers Food, and Fieldstone Granary. Other processing entities include a distillery, cidery, meadery, wineries and local cheese processors. The area is home to many strong and active agriculture and food industry associations, where producers work together for the betterment of their industry. There are also organizations that support local food supply and local production, providing an avenue for active citizens to take part.

Although the interface between urban settings and agriculture operations produces some concerns, local governments and citizens are generally very supportive of agriculture. Local governments are engaged in a number of agriculture plans and agriculturally-related strategies. Agriculture has been recognized in the North Okanagan Regional Growth Strategy with the goal of protecting agricultural lands and encouraging a sustainable regional food system. Regionally, agriculture has been identified as a contributor to the economic growth and identity of the region.

Challenges agriculture is facing and may continue to face include:

- Land tends to be expensive due to pressure for residential development.
- Access to processing facilities for livestock impacts viability of increasing locally grown meats. Expanding the sector is limited without processing facilities to pack, store and add value to products (e.g. fruits, vegetables, nuts, etc.)



- The competing demands and rising costs for water (forestry, recreation, livestock grazing and hunting) make source water protection a key consideration in Crown and private land management.
- Experienced farmers are aging and many are close to retirement. There is a need for creative solutions for succession planning.

Despite these challenges, there are many opportunities for agriculture in the North Okanagan. Underutilised areas have been identified in this report, and caution should be taken in approaching these areas, as they may already be used for forage or pasture, or have been left fallow by the farmers as part of a land management strategy. There are opportunities for increasing the economic impact of agriculture by intensifying land already in production, improving efficiencies and growing higher value crops in appropriate areas. It is recognized that with all farming practices, farmers are stewards of the land and they will continue to play an important role in lessening the environmental impact of agriculture. Proximity to markets and interest in local foods put the North Okanagan in position for economic growth of the sector and the future of agriculture in the region.

# 1. General Information

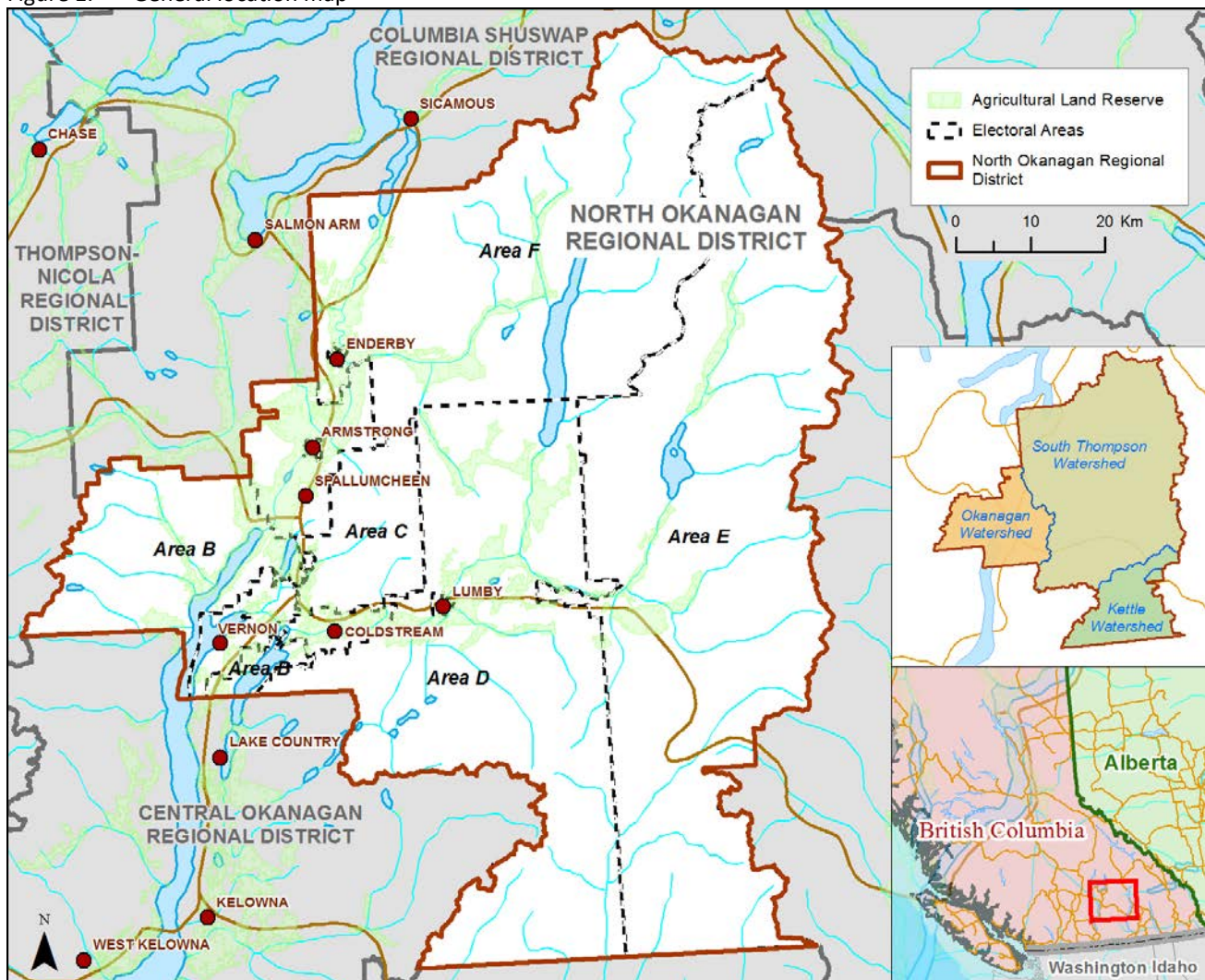
## 1.1 OVERVIEW

The Regional District of North Okanagan (RDNO) is comprised of 5 electoral areas (B – F) and 6 member municipalities (Armstrong, Coldstream, Enderby, Lumby, Spallumcheen, and Vernon ). There are three major watersheds within RDNO: the South Thompson Watershed and the Okanagan Watershed. The portion within the Okanagan Watershed is part of a larger project to inventory the entire Okanagan Water Basin.

The main economic drivers of RDNO are agriculture, forestry and tourism. In 2011, RDNO had a population of 81,237<sup>1</sup>. RDNO is experiencing overall growth with a population growth rate of 5.1% between the 2006 and 2011 census years. The highest rates of growth occurred in Armstrong (13.5% ), Coldstream (8.9%), and Lumby (5.9%), while there was a general decrease in population growth across the electoral areas.

The purpose of the Agricultural Land Use Inventory (ALUI) is to provide data to help understand the current extent of agricultural activities.

Figure 1. General location map



<sup>1</sup> Statistics Canada, 2011 Census; <http://www12.statcan.gc.ca/census-recensement/index-eng.cfm>

## 1.2 AGRICULTURAL LAND RESERVE

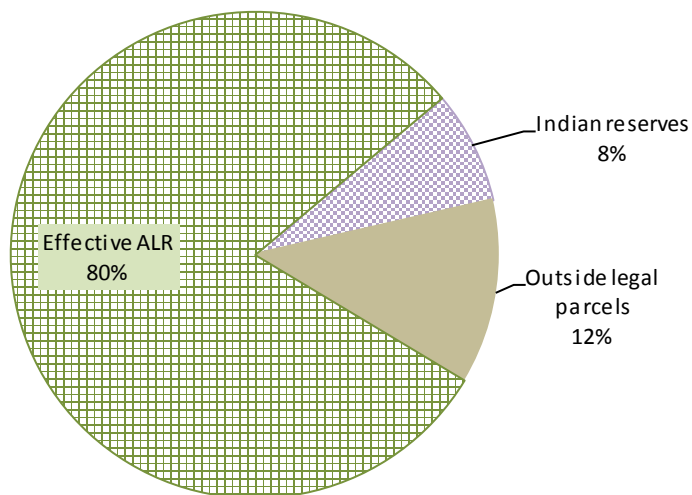
The Agricultural Land Reserve (ALR) is a provincial land use zone that was designated in 1973 in which agriculture is recognized as the priority use. Within the ALR, farming is encouraged and non-agricultural uses are controlled.

In 2013 there were 68,888 ha<sup>2</sup> of ALR land in RDNO (see Figure 1).

RDNO has a total area of 771,700<sup>4</sup> ha. Of this area 23% (178,188<sup>3</sup>) ha are in legally surveyed parcels. With 68,888 ha in the ALR, 9% of RDNO's total area is in the ALR, and 39% of the legally surveyed parcel area is in the ALR. The ALR area includes:

- 55,307 ha on inventoried parcels
- 5,176 ha on Indian reserves
- 8,405 ha outside legally surveyed parcels (rights-of-way, water, unsurveyed Crown land)

Figure 2. Proportion of ALR land by category



*Figure 2 shows the proportion of different categories of ALR land.*

*Of RDNO's ALR, 8% is on Indian reserves and 12% is outside of legally surveyed parcels in rights-of-way, water, foreshore and unsurveyed Crown land.*

*The remaining 80% is considered the "effective ALR" and is the basis of this report.*

<sup>2</sup> Provincial Agricultural Land Commission (ALC), Library, ALC Reports, Annual Report 2009/10 & 2010/11 Pg 39. <http://www.alc.gov.bc.ca>

<sup>3</sup> Calculated in GIS.

Table 1. ALR inventory area by jurisdiction

| Jurisdiction           | % of RDNO ALR area | Inventoried ALR area |                     |
|------------------------|--------------------|----------------------|---------------------|
|                        |                    | ALR (ha)             | % of effective ALR* |
| Area B                 | 6%                 | 3,943                | 7%                  |
| Area C                 | 2%                 | 1,114                | 2%                  |
| Area D                 | 23%                | 15,658               | 28%                 |
| Area E                 | 7%                 | 4,846                | 9%                  |
| Area F                 | 15%                | 10,255               | 19%                 |
| Armstrong              | < 1%               | 138                  | < 1%                |
| Coldstream             | 5%                 | 3,548                | 6%                  |
| Enderby                | < 1%               | 60                   | < 1%                |
| Lumby                  | < 1%               | 49                   | < 1%                |
| Spallumcheen           | 19%                | 13,344               | 24%                 |
| Vernon                 | 3%                 | 2,353                | 4%                  |
| <b>INVENTORY TOTAL</b> | <b>80%</b>         | <b>55,307</b>        | <b>100%</b>         |
| Indian reserves        | 8%                 | 5,176                |                     |
| Outside legal parcels  | 12%                | 8,405                |                     |
| <b>ALR TOTAL</b>       | <b>100%</b>        | <b>68,888</b>        |                     |

\* Effective ALR is the total ALR area excluding ALR on Indian reserves and ALR outside of legally surveyed parcels.

Table 1 details the inventoried ALR area by jurisdiction. There is ALR in each of RDNO's five electoral areas and six municipalities.

Area D has the most ALR land with 28% of the effective ALR, followed by Spallumcheen with 24%, and Area F with 19%.

RDNO's total ALR area includes:

- 5,176 ha on Indian reserves
- 8,405 ha that is outside of legally surveyed parcels in rights-of-way, water, foreshore, and unsurveyed Crown land

These areas are not included in the "effective ALR".

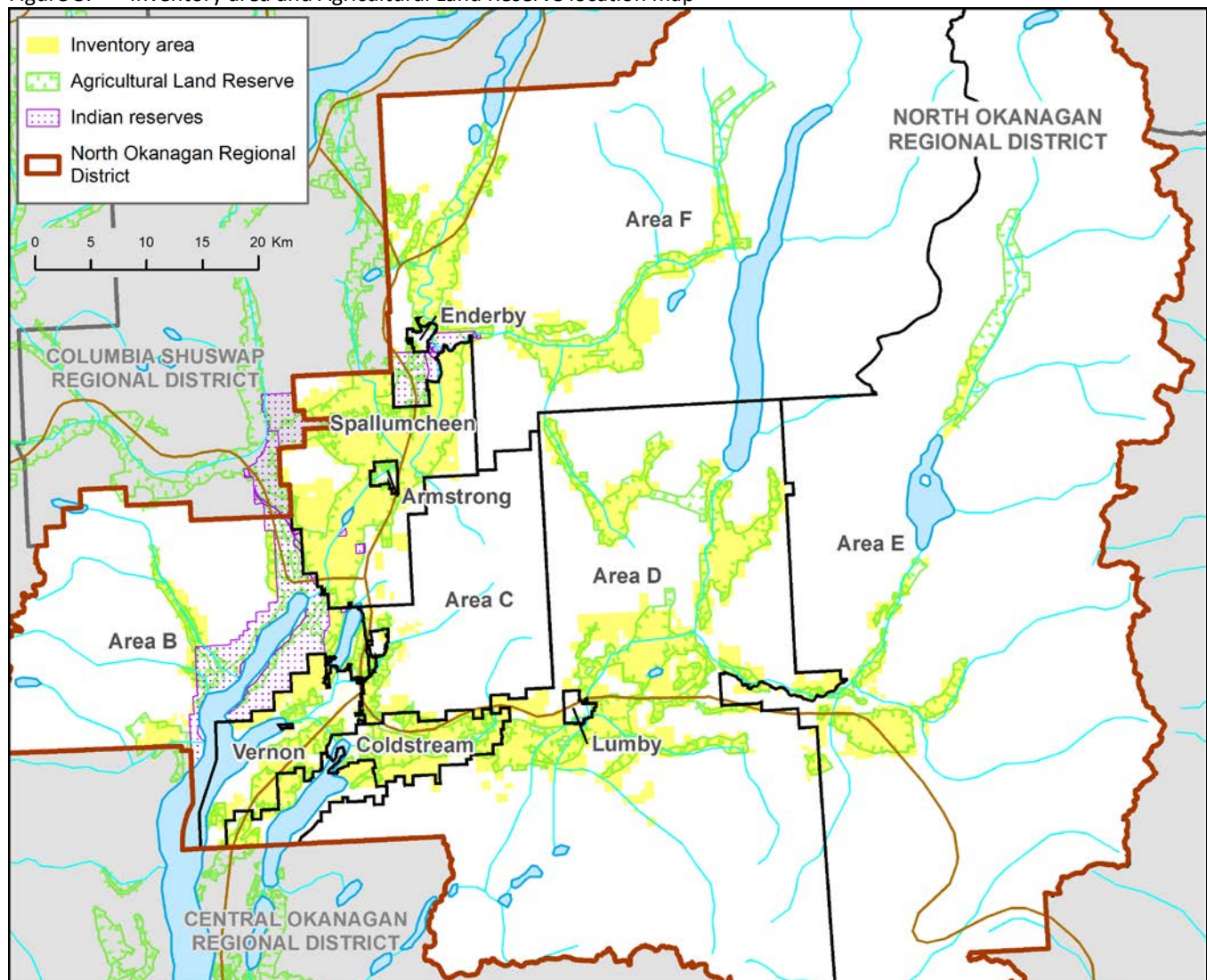
### 1.3 INVENTORY AREA

The total inventory area encompasses 6,552 parcels with a combined area of 91,048 ha. Included were all parcels:

- completely or partially within the Agricultural Land Reserve, or
- classified by BC Assessment as having “Farm” status for property tax assessment, or
- zoned to permit agriculture by local government bylaws and/or exhibiting signs of agriculture on aerial photography, or
- containing an active water licence for farming or irrigation purposes, or
- inventoried in 2006/2007 where agriculture was present

The amount of ALR land included in the inventory area is 55,307 ha located on 5,489 parcels. The other 1,063 inventoried parcels were completely outside the ALR but met one of the other inventory criteria.

Figure 3. Inventory area and Agricultural Land Reserve location map



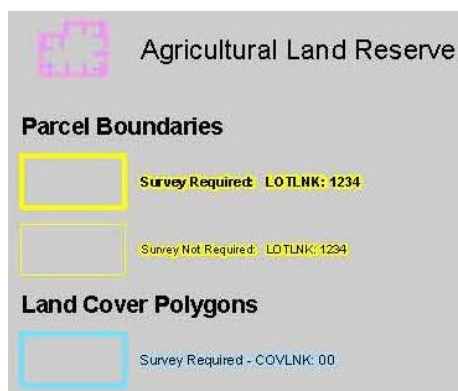
## 2. Methodology

### 2.1 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 Regional District of North Okanagan Agricultural Land Use Inventory was conducted in the summers of 2013 and 2014 by a team of professional agrologists and data technicians. A 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)<sup>4</sup>
- 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



<sup>4</sup> Cadastre mapping was provided through the Integrated Cadastral Information Society.

## 2.2 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:

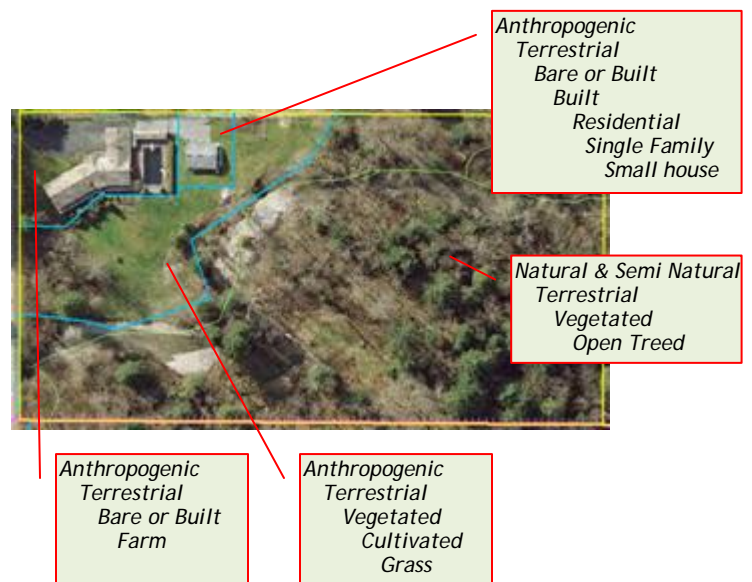
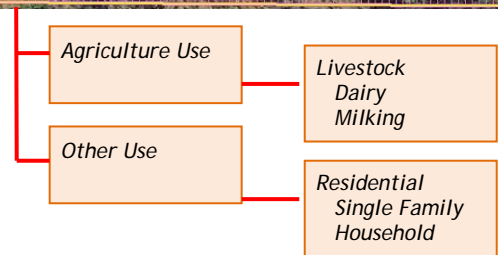
- The actual human use of land and related structures and modifications to the landscape
- Use-related land cover (where land cover implies a use or is important to interpreting patterns of use)
- Declared interests in the land (which may limit use) such as parks

In addition, the availability of 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.

## **2.3 PRESENTATION OF THE DATA**

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The data is presented in the form of summarized tables and charts. In the final formatting of the tables and charts, data values are rounded to the nearest whole number. As a result, the data may not appear to add up correctly.



## 3. Land Cover and Farmed Area

### 3.1 LAND COVER AND FARMED AREA

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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. Refer to Section 5 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, natural waterbody, 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 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.

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

Table 2. Land cover and farmed area

| Land cover                        |                            | ALR           |                    | Outside ALR (ha) | Total area (ha) |
|-----------------------------------|----------------------------|---------------|--------------------|------------------|-----------------|
|                                   |                            | In ALR (ha)   | % of effective ALR |                  |                 |
| Actively farmed                   | Cultivated field crops     | 23,560        | 43%                | 1,120            | 24,680          |
|                                   | Farm infrastructure        | 886           | 2%                 | 77               | 964             |
|                                   | Greenhouses                | 30            | < 1%               | 10               | 40              |
|                                   | Crop barn                  | 3             | < 1%               | <1               | 4               |
| Inactively farmed                 | Unused/ unmaintained crops | 781           | 1%                 | 102              | 884             |
| <b>FARMED</b>                     |                            | <b>25,261</b> | <b>45%</b>         | <b>1,310</b>     | <b>26,571</b>   |
| Anthropogenic (not farmed)        | Managed vegetation         | 948           | 2%                 |                  |                 |
|                                   | Non Built or Bare          | 207           | < 1%               |                  |                 |
|                                   | Residential footprint      | 826           | 1%                 |                  |                 |
|                                   | Built up - Other           | 167           | < 1%               |                  |                 |
|                                   | Transportation & utilities | 427           | < 1%               |                  |                 |
| <b>ANTHROPOGENIC (NOT FARMED)</b> |                            | <b>2,574</b>  | <b>5%</b>          |                  |                 |
| Natural and Semi-natural          | Vegetated                  | 26,920        | 49%                |                  |                 |
|                                   | Wetlands                   | 112           | < 1%               |                  |                 |
|                                   | Waterbodies                | 439           | < 1%               |                  |                 |
| <b>NATURAL &amp; SEMI-NATURAL</b> |                            | <b>27,472</b> | <b>50%</b>         |                  |                 |
| <b>TOTAL ALR INVENTORIED</b>      |                            | <b>55,307</b> | <b>100%</b>        |                  |                 |

\* Refer to the glossary for terms used in this table.

Table 2 shows the extent of different land cover types across the ALR in RDNO.

In the ALR, there are 25,261 ha of "Farmed" land cover. Of this area, 781 ha are "inactively farmed" in unused or unmaintained crops.

An additional 1,310 ha of "Farmed" land cover outside the ALR was identified.

Figure 4. Land cover in the effective ALR

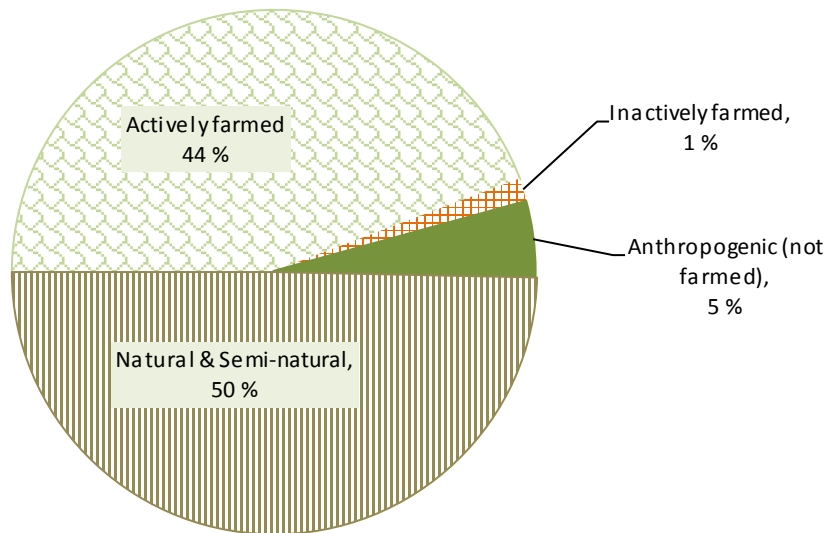


Figure 4 shows the proportion of different land cover categories across RDNO's effective ALR.

Forty-four percent (44%) of the effective ALR is in "Actively farmed" land cover.

Land used in support of farming such as farm residences, vegetative buffers or roadways is not included as farmed land cover.

Table 3. Land cover categories in the ALR by jurisdiction

| Jurisdiction     | Land Cover Category |                    |                            |                    |                        |                    | Total         |                    |
|------------------|---------------------|--------------------|----------------------------|--------------------|------------------------|--------------------|---------------|--------------------|
|                  | Farmed *            |                    | Anthropogenic (not farmed) |                    | Natural & Semi-natural |                    |               |                    |
|                  | In ALR (ha)         | % of RDNO ALR area | In ALR (ha)                | % of RDNO ALR area | In ALR (ha)            | % of RDNO ALR area | In ALR (ha)   | % of RDNO ALR area |
| Spallumcheen     | 9,246               | 17%                | 783                        | 1%                 | 3,315                  | 6%                 | 13,344        | 24%                |
| Area D           | 5,871               | 11%                | 334                        | < 1%               | 9,453                  | 17%                | 15,658        | 28%                |
| Area F           | 4,561               | 8%                 | 355                        | < 1%               | 5,339                  | 10%                | 10,255        | 19%                |
| Coldstream       | 1,835               | 3%                 | 362                        | < 1%               | 1,351                  | 2%                 | 3,548         | 6%                 |
| Area E           | 1,266               | 2%                 | 100                        | < 1%               | 3,480                  | 6%                 | 4,846         | 9%                 |
| Area B           | 1,101               | 2%                 | 183                        | < 1%               | 2,659                  | 5%                 | 3,943         | 7%                 |
| Vernon           | 748                 | 1%                 | 190                        | < 1%               | 1,414                  | 3%                 | 2,353         | 4%                 |
| Area C           | 492                 | < 1%               | 222                        | < 1%               | 399                    | < 1%               | 1,114         | 2%                 |
| Armstrong        | 80                  | < 1%               | 24                         | < 1%               | 33                     | < 1%               | 138           | < 1%               |
| Enderby          | 37                  | < 1%               | 6                          | < 1%               | 17                     | < 1%               | 60            | < 1%               |
| Lumby            | 23                  | < 1%               | 14                         | < 1%               | 13                     | < 1%               | 49            | < 1%               |
| <b>TOTAL ALR</b> | <b>25,261</b>       | <b>45%</b>         | <b>2,574</b>               | <b>5%</b>          | <b>27,472</b>          | <b>50%</b>         | <b>55,307</b> | <b>100%</b>        |

\* 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. Does not include natural pasture.

Table 3 shows the proportion of each land cover category across RDNO’s ALR by jurisdiction. In total, 45% of RDNO’s ALR is in “Farmed” land cover.

Of all RDNO jurisdictions, Spallumcheen has the greatest amount of farmed land cover in the ALR (9,246 ha and 17% of RDNO’s ALR area). Area D is second with 5,871 ha of farmed land cover in the ALR and 11% of RDNO’s ALR area.

Refer to Figure 6 for a comparison of the jurisdictions that are best utilizing their ALR area for farming.

Figure 5. Farmed land cover in RDNO by jurisdiction

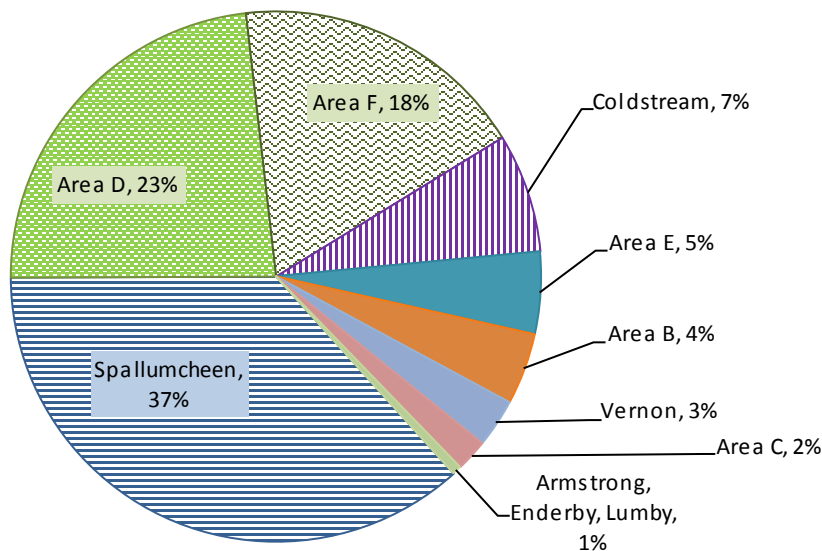


Figure 5 shows the location of the farmed land cover in RDNO’s ALR.

Of the 25,261 ha of farmed land cover, 37% occurs in Spallumcheen, 23% occurs in Area D, and 18% occurs in Area F.

Figure 6. Proportion of land cover categories in the ALR by jurisdiction

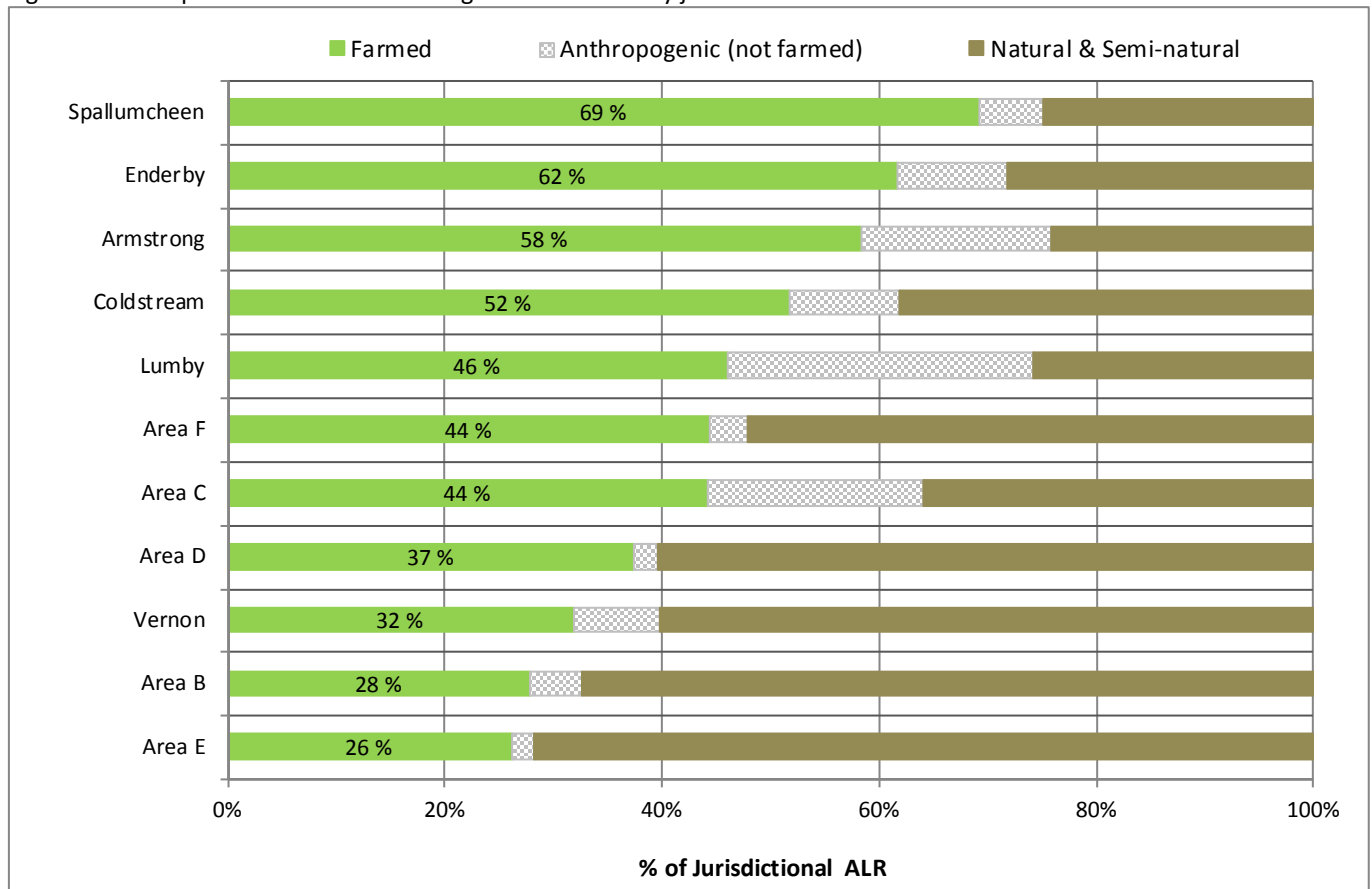


Figure 6 shows the proportion of ALR land in “Farmed”, anthropogenic (not farmed), and natural & semi-natural land cover by RDNO jurisdiction.

Spallumcheen and Enderby are the jurisdictions which best utilize their ALR land for farming and have the highest proportions of farmed land cover.

Although Enderby has a high proportion of its ALR in “Farmed” land cover, the municipality has a relatively small amount of “farmed” land cover with only 38 ha (refer to Table 3).

Area E, Area B, Vernon, Area D and Area F all have large proportions of ALR in “Natural and semi-natural” land cover. Lumby has the highest proportion of “anthropogenic” (not farmed) land cover. In total, 28% of the Lumby’s effective ALR is in anthropogenic (not farmed) land cover.

Refer to Table 3 for the total area in each land cover category.

### 3.2 STATUS OF THE EFFECTIVE ALR

Land cover, land use and physical site limitations (e.g. topography, flooding) were used to assess how much land is available and may have potential for farming in the future.

**Farmed** or supporting farming: includes “**actively farmed**” land cover as well as farm houses, farm roads, and other built structures on farmed parcels. Actively farmed land cover includes cultivated crops, farm infrastructure, greenhouses and crops barns, but excludes unused / unmaintained crops and greenhouses.

Not farmed – **unavailable for farming**: areas where future agricultural development is improbable due to a conflicting land use or land cover. Examples of unavailable for farming land uses include golf courses, parks, and small lot residential. Examples of unavailable for farming land covers include wetlands, waterbodies, and industrial or commercial buildings.

Not farmed – **limited potential for farming**: land with significant physical or operational constraints to farming. Included are areas with steep terrain, rocky soils, riparian areas, or a very small (less than 0.4 ha) or awkward shape.

Not farmed – **available for farming**: areas that can be used for agriculture without displacing a current use. Includes natural and semi natural land cover, managed vegetation (managed for landscaping, dust or soil control), and non-built or bare areas. These areas must be free from physical and operational constraints.

Figure 7. Status of the effective ALR with respect to farming

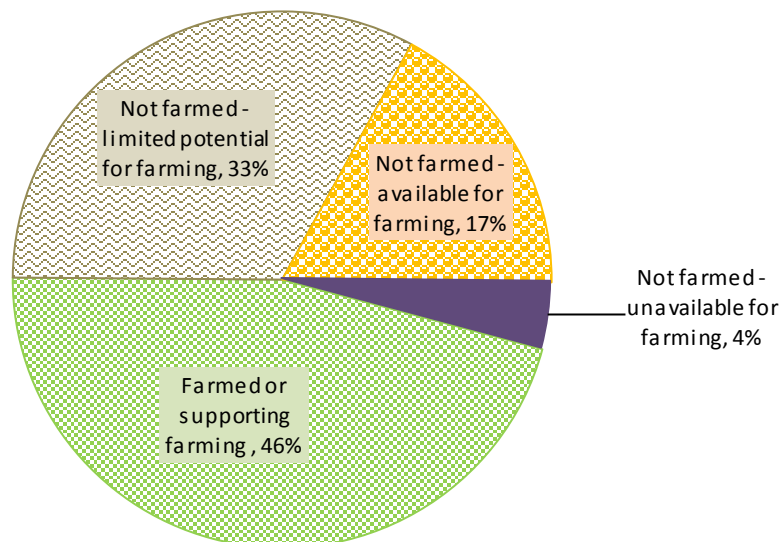


Figure 7 shows the status of the effective ALR in relation to farming in RDNO. This analysis is focused on land cover.

Forty-six percent (46%) of the effective ALR is actively farmed or is supporting farming.

Thirty-three percent (33%) has limited potential for farming due to physical site limitations such as soils &/or topography and 4% is unavailable for farming due to an existing land use or land cover.

The remaining 17% is available and may have potential for farming as it is not limited by significant physical constraints or built areas.

Available for farming land cover is further described in Section 6: ALR Availability for Farming . Parcel availability for farming is also described in Section 6.

One third (33%) of the ALR land cover in RDNO has limited potential for farming due to physical constraints. While it is true that most commercial farmers don't leave farmable land idle, it is also true that farmers value privacy and views. Many farmers voluntarily conserve natural areas to protect water quality and wildlife habitat. Expanding a farming operation to land with physical constraints, such as steep slopes or poor soils, requires capital investment which may not be viable.

Figure 8. Site limitations on ALR with limited potential for farming

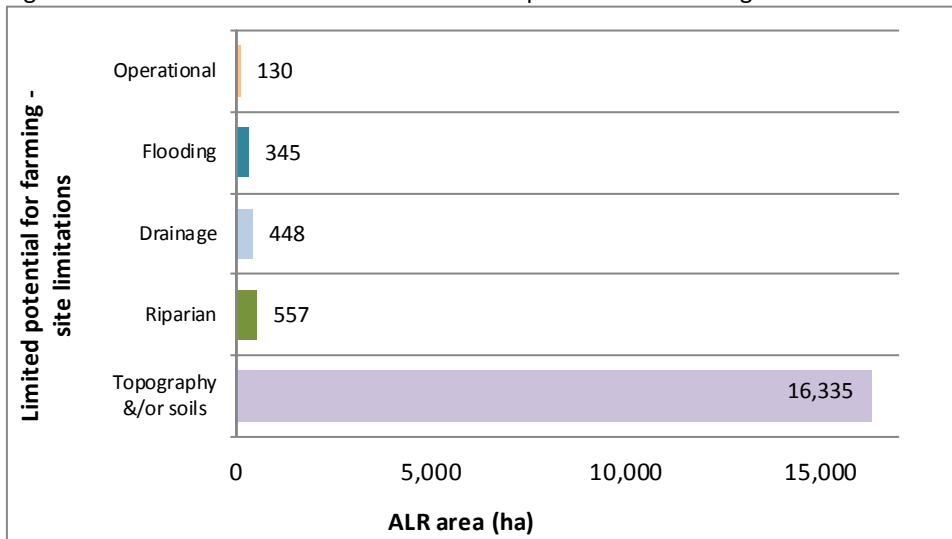


Figure 8 details the site limitations on areas considered to have limited potential for farming (33% of the effective ALR).

Nearly all of these areas have a topography &/or soil limitation (16,335 ha out of 17,815 ha or 92%).

Figure 9. Available land and site limitations on ALR by farming status

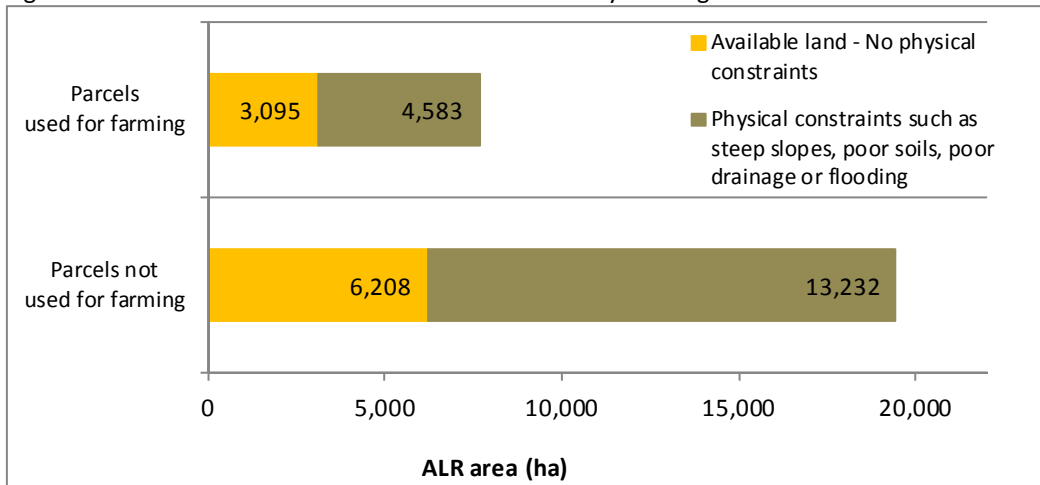


Figure 9 details the amount of land available and with limited potential for farming by farming status.

Over 3,000 ha of available for farming land is on parcels that are already used for farming. This land may represent areas that could be amalgamated into existing fields, however, this land may also be serving a purposes that was not apparent during the field survey (e.g. grazing conservation, privacy, etc.) or may have an unobserved physical limitation (e.g. soils, drainage).

Available for farming land cover is further assessed in Section 6: ALR Availability for Farming.

## 4. Farming Activities

### 4.1 CULTIVATED FIELD CROPS

Cultivated field crops are captured in a geographic information system (GIS) at the field or land cover polygon level by crop type (e.g. vegetables, forage or pasture, berries). The total land area was then evaluated for each crop.

Included with cultivated field crops is fallow farmland and land 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 RDNO are described by eleven crop groupings and are listed by descending order of significance:

- **Forage & pasture:** grass, mixed grass/legume, forage corn, forage cereal/peas
- **Cereals & oilseeds:** wheat, canola, barley, oats, triticale, rye
- **Tree fruits:** apple, cherries, mixed tree fruits, plums, peaches, apricots, pears
- **Other:** bare cultivated land (land that is tilled or plowed, but with no visible crop) , fallow land (cultivated land that has not been seeded or planted for one or more growing season), land in crop transition and land planted in cover grass or under mulch to manage soil moisture/erosion associated with a cultivated crop.
- **Nursery:** ornamentals and shrubs, forestry stock, cedar hedging
- **Trees (plantation):** Christmas trees, fibre/pulp/veneer trees, woody cuts
- **Vegetables:** mixed vegetables, sweet corn, Cole crops, potatoes, cucurbits, pumpkins, other root vegetables
- **Vines & berries:** grapes, blueberries, strawberries, mixed, raspberries, blackberries
- **Turf**
- **Specialty:** echinacea, rhubarb
- **Floriculture**

Figure 10. Main field crop types by percentage

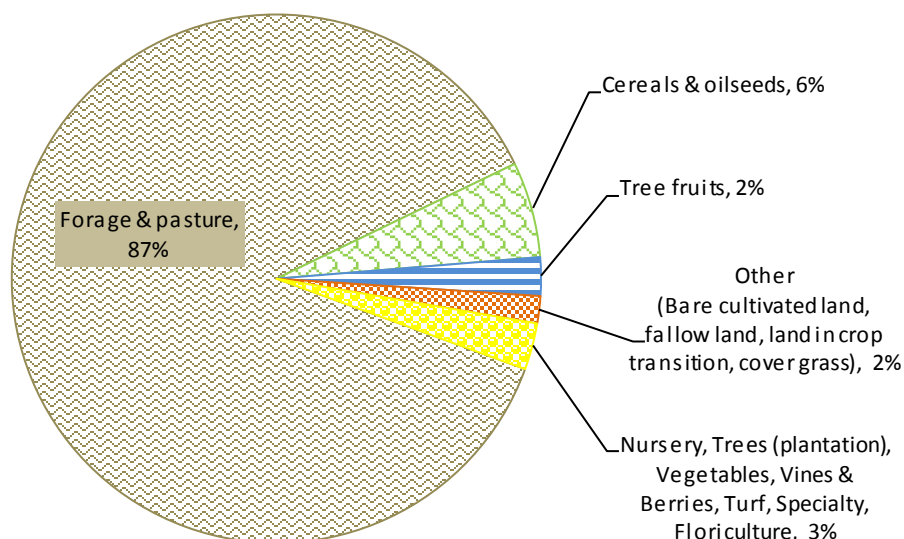


Figure 10 shows the proportion of the main field crop types across RDNO's cultivated land. Forage & pasture accounts for 87% of all cultivated land.

Table 4. Cultivated crop area by jurisdiction

| Jurisdiction | Cultivated field crops (ha) |                  |                 | % of cultivated land in RDNO |
|--------------|-----------------------------|------------------|-----------------|------------------------------|
|              | In ALR (ha)                 | Outside ALR (ha) | Total area (ha) |                              |
| Spallumcheen | 8,607                       | 273              | 8,880           | 36 %                         |
| Area D       | 5,461                       | 264              | 5,725           | 23 %                         |
| Area F       | 4,238                       | 289              | 4,527           | 18 %                         |
| Coldstream   | 1,741                       | 44               | 1,785           | 7 %                          |
| Area E       | 1,142                       | 69               | 1,210           | 5 %                          |
| Area B       | 1,054                       | 56               | 1,110           | 4 %                          |
| Vernon       | 733                         | 71               | 804             | 3 %                          |
| Area C       | 455                         | 27               | 481             | 2 %                          |
| Armstrong    | 71                          | 8                | 80              | < 1%                         |
| Enderby      | 36                          | 8                | 44              | < 1%                         |
| Lumby        | 23                          | 11               | 34              | < 1%                         |
| <b>TOTAL</b> | <b>23,560</b>               | <b>1,120</b>     | <b>24,680</b>   | <b>100 %</b>                 |

Table 4 shows the distribution of cultivated crops by jurisdiction.

Spallumcheen and Area D have the greatest amounts of cultivated field crops.

Combined, Spallumcheen, Area D and Area F contain 77% of the field crops in RDNO.

Table 5. Main field crop types by area

| Jurisdiction | Cultivated crops (ha) |                    |             |            |            |                    |            |                 |           |           |               | Total Area (ha) |
|--------------|-----------------------|--------------------|-------------|------------|------------|--------------------|------------|-----------------|-----------|-----------|---------------|-----------------|
|              | Forage & pasture      | Cereals & oilseeds | Tree fruits | Other*     | Nursery    | Trees (plantation) | Vegetables | Vines & berries | Turf      | Specialty | Floriculture  |                 |
| Spallumcheen | 7,254                 | 1,046              | 62          | 208        | 175        | 15                 | 89         | 25              | -         | 6         | < 1           | 8,880           |
| Area D       | 5,491                 | 114                | -           | 105        | < 1        | 2                  | 13         | -               | -         | -         | -             | 5,725           |
| Area F       | 4,139                 | 257                | < 1         | 40         | 29         | 17                 | 27         | 18              | -         | -         | < 1           | 4,527           |
| Coldstream   | 1,478                 | -                  | 193         | 43         | 6          | 29                 | 8          | 7               | 22        | -         | -             | 1,785           |
| Area E       | 1,206                 | -                  | -           | < 1        | -          | -                  | -          | 4               | -         | -         | -             | 1,210           |
| Area B       | 850                   | -                  | 211         | 5          | -          | 33                 | 5          | 5               | -         | -         | -             | 1,110           |
| Vernon       | 589                   | -                  | 51          | 5          | 9          | 122                | 14         | 13              | -         | -         | -             | 804             |
| Area C       | 410                   | -                  | 64          | 2          | 5          | < 1                | < 1        | < 1             | -         | -         | < 1           | 481             |
| Armstrong    | 56                    | 19                 | -           | 2          | -          | -                  | 2          | -               | -         | -         | -             | 80              |
| Enderby      | 36                    | 8                  | -           | -          | -          | -                  | -          | -               | -         | -         | -             | 44              |
| Lumby        | 34                    | -                  | -           | -          | -          | -                  | -          | -               | -         | -         | -             | 34              |
| <b>TOTAL</b> | <b>21,543</b>         | <b>1,444</b>       | <b>581</b>  | <b>411</b> | <b>224</b> | <b>219</b>         | <b>158</b> | <b>72</b>       | <b>22</b> | <b>6</b>  | <b>&lt; 1</b> | <b>24,680</b>   |

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

Table 5 details the crop types in RDNO by jurisdiction. Forage & pasture is the dominant crop type across all jurisdictions.

In addition to the active, cultivated crops, there are an additional 884 ha of inactive or unmaintained crops: 863 or 98% of the inactive crops are forage & pasture.



## Forage & pasture crops

Forage & pasture is the main crop type in the Regional District of North Okanagan.

- Forage is a cultivated crop that is cut and made into silage or hay for livestock feed.
- Pasture is a cultivated crop that is used for grazing only and is not cut.
- Forage & pasture is grazed for 1 - 3 months per year and is also cut for silage or hay.

Figure 11. Forage & pasture types by percentage

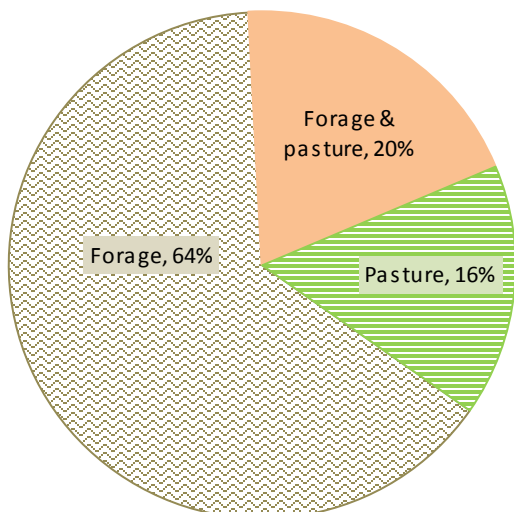


Figure 11 shows the proportion of forage & pasture types in RDNO.

Of all forage & pasture, 64% are used exclusively for forage while 20% is used for both forage & pasture.

Table 6. Forage crops by total area and jurisdiction

| Jurisdiction | Forage & pasture (ha) |                  |              | Total area (ha) | % of forage & pasture crops (ha) |
|--------------|-----------------------|------------------|--------------|-----------------|----------------------------------|
|              | Forage                | Forage & pasture | Pasture      |                 |                                  |
| Spallumcheen | 5,801                 | 636              | 817          | 7,254           | 34%                              |
| Area D       | 3,113                 | 1,669            | 709          | 5,491           | 25%                              |
| Area F       | 3,021                 | 605              | 512          | 4,139           | 19%                              |
| Coldstream   | 968                   | 53               | 458          | 1,478           | 7%                               |
| Area E       | 273                   | 745              | 188          | 1,206           | 6%                               |
| Area B       | 255                   | 341              | 254          | 850             | 4%                               |
| Vernon       | 161                   | 57               | 370          | 589             | 3%                               |
| Area C       | 212                   | 58               | 140          | 410             | 2%                               |
| Armstrong    | 31                    | 23               | 3            | 56              | < 1%                             |
| Enderby      | 13                    | 5                | 17           | 36              | < 1%                             |
| Lumby        | 34                    | -                | -            | 34              | < 1%                             |
| <b>TOTAL</b> | <b>13,883</b>         | <b>4,192</b>     | <b>3,468</b> | <b>21,543</b>   | <b>100%</b>                      |

Table 6 details the amount of forage and pasture in RDNO by jurisdiction.

Spallumcheen, Area D, Area F, and Coldstream all have significantly more forage than pasture. These jurisdictions have many livestock operations and are growing large amounts of livestock feed. These 4 jurisdictions account for 85% of all forage and pasture crops in RDNO.

Vernon has more pasture than forage.

## Grain crops

Grains are organized into categories based on the type of grain:

- **Cereals** are members of the grass family that are often used for livestock food (barley, oats, rye, wheat and triticale).
- **Pulses** are the seeds of legumes which are used for livestock food (field peas).
- **Oilseeds** are used to extract oil from their seeds (canola).

There are few pulses reported in the inventory area, however many silage producers grow field peas with their barley or oat silage crops. These mixed crop fields are difficult to identify using a windshield survey method as the peas are not visible for much of the growing season.

Figure 12. Cereal & oilseed crop types by percentage

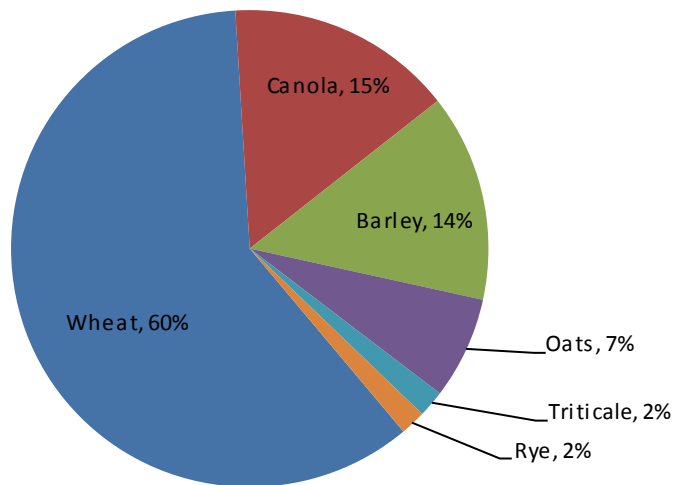


Figure 12 shows the proportion of the types of cereals & oilseeds in RDNO.

Wheat combined with canola and barley account for 89% of all cereals & oilseeds.

Table 7. Cereal & oilseed crops by total area and jurisdiction

| Jurisdiction | Cereals & oilseeds (ha) |            |            |            |           |           | Total area (ha) | % of cereal & oilseed crops (ha) |
|--------------|-------------------------|------------|------------|------------|-----------|-----------|-----------------|----------------------------------|
|              | Wheat                   | Canola     | Barley     | Oats       | Triticale | Rye       |                 |                                  |
| Spallumcheen | 715                     | 150        | 119        | 11         | 26        | 25        | 1,046           | 72%                              |
| Area F       | 111                     | 65         | -          | 84         | -         | -         | 260             | 18%                              |
| Area D       | 23                      | < 1        | 85         | 5          | -         | -         | 114             | 8%                               |
| Armstrong    | 13                      | 6          | -          | -          | -         | -         | 19              | 1%                               |
| Enderby      | 8                       | -          | -          | -          | -         | -         | 8               | < 1%                             |
| <b>TOTAL</b> | <b>871</b>              | <b>222</b> | <b>204</b> | <b>100</b> | <b>26</b> | <b>25</b> | <b>1,448</b>    | <b>100%</b>                      |

Table 7 details the amount and types of cereals & oilseeds in RDNO by jurisdiction.

Wheat is the main cereal & oilseed crop in RDNO with 871 ha, followed by canola with 222 ha and barley with 204 ha.

Seventy-two percent (72%) of the cereal & oilseed crops occur in Spallumcheen.

## 4.2 GREENHOUSES & CROP BARN

Greenhouses are structures covered with translucent material and of sufficient size for a person to work inside<sup>5</sup>. They are permanent enclosed glass or polyethylene (poly) structures with or without climate control facilities for growing plants under controlled environments. Crop barns are permanent structures with non-translucent walls that are used for growing mushrooms or specialty crops such as bean sprouts. Non permanent structures such as hoop covers are considered an agricultural practice and are not included here.

Greenhouse and crop barn activities are delineated to the exact footprint to enable agricultural water demand calculations. A single greenhouse activity may have more than one greenhouse of the same type (e.g. poly or glass) if the buildings are adjacent to one another.

Figure 13. Distribution of greenhouse and crop barn area by jurisdiction

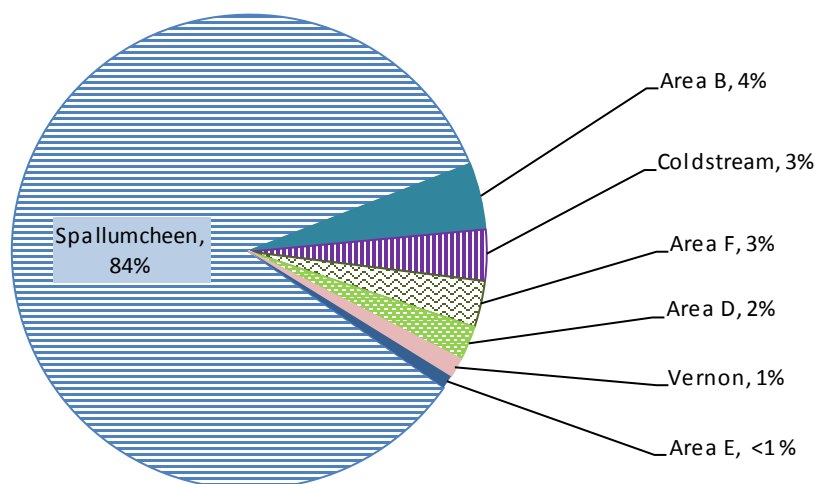


Figure 13 shows the location of the greenhouses and crop barns in RDNO.

Eighty-four percent (84%) of RDNO's greenhouse and crop barn area occurs in Spallumcheen.

Table 8. Greenhouse and crop barn area by jurisdiction

| Jurisdiction | Area (sq m)*  |                  |                 | Total area (sq m) | % of greenhouse area |
|--------------|---------------|------------------|-----------------|-------------------|----------------------|
|              | Crop barn     | Glass greenhouse | Poly greenhouse |                   |                      |
| Spallumcheen | 5,000         | 228,000          | 136,000         | 370,000           | 84%                  |
| Area B       | 14,000        | -                | 6,000           | 20,000            | 5%                   |
| Coldstream   | 10,000        | -                | 5,000           | 15,000            | 3%                   |
| Area F       | 1,000         | 1,000            | 12,000          | 14,000            | 3%                   |
| Area D       | 8,000         | -                | 2,000           | 10,000            | 2%                   |
| Vernon       | -             | -                | 6,000           | 6,000             | 1%                   |
| Area E       | -             | 3,000            | 1,000           | 4,000             | < 1%                 |
| <b>TOTAL</b> | <b>38,000</b> | <b>232,000</b>   | <b>168,000</b>  | <b>439,000</b>    | <b>100%</b>          |

\* Conversion. 10,000 square meters = 1 hectare

Table 8 summarizes the total area in greenhouse and crop barn footprints by jurisdiction.

Spallumcheen has the largest area in greenhouses and crop barns.

<sup>5</sup> Source: *Guide for Bylaw Development in Farming Areas*, 2013. Ministry of Agriculture.

Table 9. Number of parcels with greenhouses and crop barns by jurisdiction

| Jurisdiction | Number of parcels |                  |                 | Parcel count | % of parcels with greenhouses |
|--------------|-------------------|------------------|-----------------|--------------|-------------------------------|
|              | Crop barn         | Glass greenhouse | Poly greenhouse |              |                               |
| Spallumcheen | 1                 | 4                | 15              | 20           | 38%                           |
| Area F       | 1                 | 1                | 7               | 9            | 17%                           |
| Area B       | 3                 | -                | 4               | 7            | 13%                           |
| Vernon       | -                 | -                | 6               | 6            | 12%                           |
| Area D       | 2                 | -                | 3               | 5            | 10%                           |
| Coldstream   | 2                 | -                | 1               | 3            | 6%                            |
| Area E       | -                 | 1                | 1               | 2            | 4%                            |
| <b>TOTAL</b> | <b>9</b>          | <b>6</b>         | <b>37</b>       | <b>52</b>    | <b>100%</b>                   |

Table 9 summarizes the number of parcels with greenhouses and crop barns by jurisdiction.

Spallumcheen has the most parcels with greenhouse or crop barn activities.

There are more parcels with poly greenhouses, however, glass greenhouses comprise a larger total area than poly greenhouses.

### 4.3 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, the maintenance of managed vegetation, and the control of soil erosion or dust. The availability of water delivery infrastructure and good quality water for irrigation are often requirements for growing high-value crops. Insufficient water sources or water delivery infrastructure can limit the potential to increase agricultural production through irrigation.

Irrigation is captured at the field or land cover level by system type (e.g. giant gun, trickle, sprinkler) 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 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, individual cultivated field crops are evaluated for percent of crop area under irrigation.

An updated Agricultural Water Demand Model (AWDM) is being created for the Okanagan Water Basin. The AWDM is a water management planning tool that estimates current and future agricultural water needs. The model utilizes Agricultural Land Use Inventory crop and irrigation data, as well as soil and climate data from external sources. The Okanagan Basin AWDM Report<sup>6</sup> will highlight the results from several climate change scenarios and water management practices.

<sup>6</sup> <http://www2.gov.bc.ca/gov/content/industry/agriculture-seafood/agricultural-land-and-environment/water/water-management/agriculture-water-demand-model>

Figure 14. Irrigation systems by percentage of cultivated land

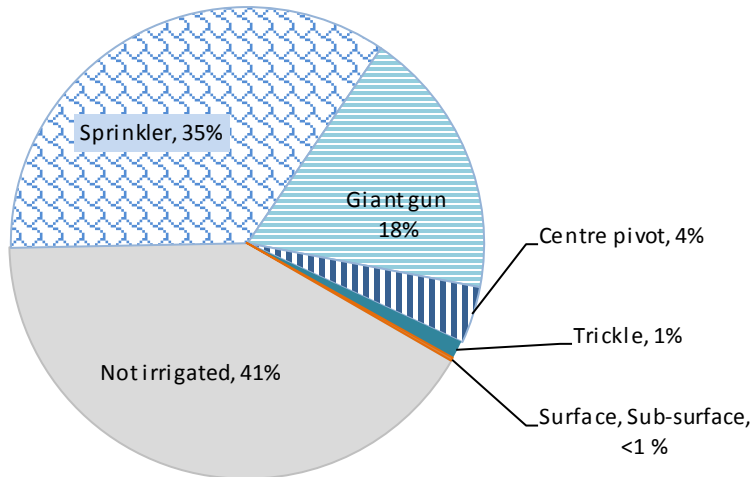


Figure 14 illustrates the proportion of different irrigation systems on cultivated crops in RDNO.

Forty-one percent (41%) of all cultivated field crops were not irrigated.

Table 10. All crop types and irrigation

| Cultivated field crop            | Irrigation system in use (ha) |              |              |              |            | Total area irrigated (ha) | % of crop area irrigated |
|----------------------------------|-------------------------------|--------------|--------------|--------------|------------|---------------------------|--------------------------|
|                                  | Surface, Sub-surface          | Sprinkler    | Giant gun    | Centre pivot | Trickle    |                           |                          |
| Forage & pasture                 | 5                             | 7,424        | 4,252        | 910          | 2          | 12,593                    | 58%                      |
| Tree fruits                      | 3                             | 372          | < 1          | -            | 204        | 579                       | 100%                     |
| Cereals & oilseeds               | -                             | 364          | 98           | 29           | -          | 492                       | 34%                      |
| Nursery                          | -                             | 176          | 24           | -            | 11         | 211                       | 94%                      |
| Trees (plantation)               | -                             | 103          | 59           | -            | 42         | 204                       | 93%                      |
| Other*                           | -                             | 54           | 97           | -            | -          | 151                       | 37%                      |
| Vegetables                       | -                             | 99           | 22           | 22           | 6          | 149                       | 94%                      |
| Vines & berries                  | -                             | 31           | -            | -            | 36         | 67                        | 94%                      |
| Turf                             | -                             | 22           | -            | -            | -          | 22                        | 100%                     |
| Specialty                        | -                             | 6            | -            | -            | -          | 6                         | 100%                     |
| Floriculture                     | -                             | < 1          | -            | -            | -          | < 1                       | 100%                     |
| <b>TOTAL CROP AREA IRRIGATED</b> | <b>8</b>                      | <b>8,652</b> | <b>4,552</b> | <b>961</b>   | <b>302</b> | <b>14,474</b>             | <b>59%</b>               |
| Greenhouses & crop barns         | Flood and trickle irrigation  |              |              |              |            | 44                        | 100%                     |

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

Table 10 outlines the types of irrigation systems used on cultivated field crops in RDNO.

Most crops types have a large proportion of their total area that is irrigated.

Exceptions are forage & pasture, where only 58% of the crop is irrigated and cereals & oilseeds where only 34% of the crop area is irrigated.

In total, 59% of RDNO's cultivated crop area is irrigated (14,474 ha out of 24,680 ha of cultivated field crops).

Table 11. Irrigation by jurisdiction

| Jurisdiction      | Irrigated area (ha) | Total crop area (ha) | % of jurisdiction crop area that is irrigated |
|-------------------|---------------------|----------------------|---|
| Spallumcheen      | 4,663               | 8,880                | 53 %  |
| Area D            | 3,701               | 5,725                | 65 %  |
| Area F            | 2,370               | 4,527                | 52 %  |
| Coldstream        | 1,478               | 1,785                | 83 %  |
| Area E            | 364                 | 1,210                | 30 %  |
| Area B            | 771                 | 1,110                | 70 %  |
| Vernon            | 748                 | 804                  | 93 %  |
| Area C            | 281                 | 481                  | 58 %  |
| Armstrong         | 59                  | 80                   | 74 %  |
| Enderby           | 5                   | 44                   | 12 %  |
| Lumby             | 34                  | 34                   | 100 %   |
| <b>TOTAL AREA</b> | <b>14,474</b>       | <b>24,680</b>        | <b>59 %</b>                                   |

Table 11 details the total crop area and the crop area under irrigation by jurisdiction.

Spallumcheen and Area D have the greatest total areas under irrigation.

Of all jurisdictions, Lumby has the largest proportion of its cropped area under irrigation (100%). Forage & pasture was the only crop in Lumby (refer to Table 5)

Figure 15. Distribution of RDNO's irrigated crop area by jurisdiction

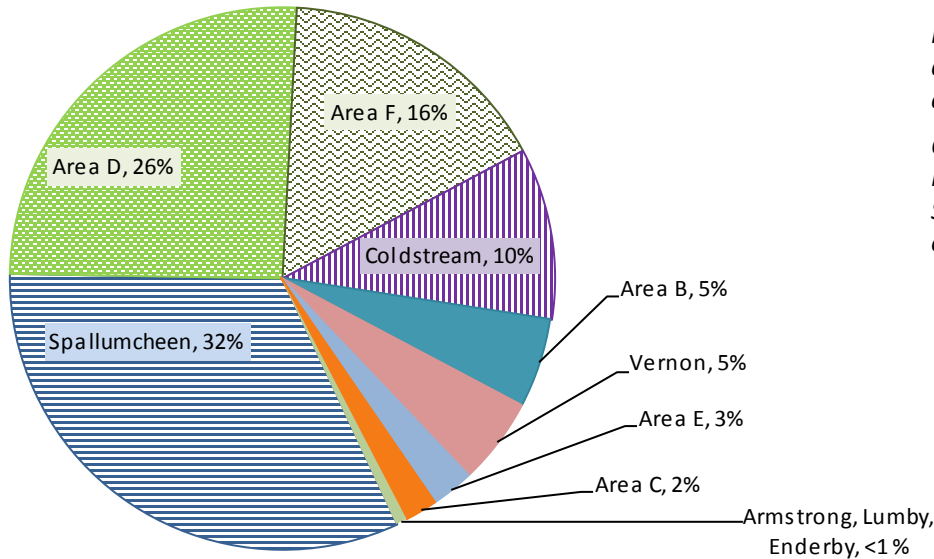


Figure 15 illustrates the distribution of the irrigated crop area by jurisdiction.

Of the irrigated crops in RDNO, 32% occur in Spallumcheen, and 26% occur in Area D.

## 4.4 LIVESTOCK

Livestock activities are challenging to measure using a windshield survey. Livestock are often confined to structures making it difficult 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. This inventory reports livestock on the parcel where the animals or related structures were observed.

"**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 the specific type of livestock could not be determined.

The scale system used to describe livestock operations relies on animal unit equivalents (AUE) 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). Estimated AUE: 1
- "**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). Estimated AUE: 13
- "**Medium**" LESS THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1000 sheep, 5000 turkeys, 10,000 chickens (25 - 100 animal unit equivalents). Estimated AUE: 63
- "**Large**" MORE THAN 100 cows or horses or bison, 300 hogs, 500 goats or deer, 1000 sheep, 5000 turkeys, 10,000 chickens (over 100 animal unit equivalents). Estimated AUE: 150

**Estimated animal unit equivalents** are calculated using the midpoint of each scale range described above. This calculation provides a number that ranks the relative importance and impact of each livestock type. The actual number of animals may be under estimated, especially for large operations.

**Number of activities.** Each occurrence of livestock on a parcel is counted as one activity. A small mixed farm with 1-2 cows and a large commercial milking operations are each counted as one activity.

Table 12. Livestock activities

| Livestock group      | Estimated animal unit equivalents | Count of activities |
|----------------------|-----------------------------------|---------------------|
| Beef                 | 16,250                            | 342                 |
| Equine               | 10,030                            | 793                 |
| Dairy                | 7,710                             | 97                  |
| Poultry              | 5,260                             | 177                 |
| Sheep / lamb / goat  | 1,570                             | 124                 |
| Unknown livestock    | 1,420                             | 76                  |
| Llama / alpaca       | 540                               | 43                  |
| Swine                | 170                               | 15                  |
| Specialty livestock* | 160                               | 18                  |
| <b>TOTAL</b>         | <b>43,110</b>                     | <b>1,685</b>        |

*Table 12 details the number of estimated animal unit equivalents by livestock type.*

*Beef activities have the highest estimated animal unit equivalents.*

*Although equine has the greatest number of individual activities (793), equine ranks second in terms of estimated animal unit equivalents.*

\* Specialty livestock includes ratites (e.g. emu, ostrich, peacock); game birds (e.g. partridge, pheasant, pigeon, quail); bison; and deer.

## Estimated Animal Unit Equivalent (AUEs)

Figure 16. Proportion of livestock activities by estimated animal unit equivalents

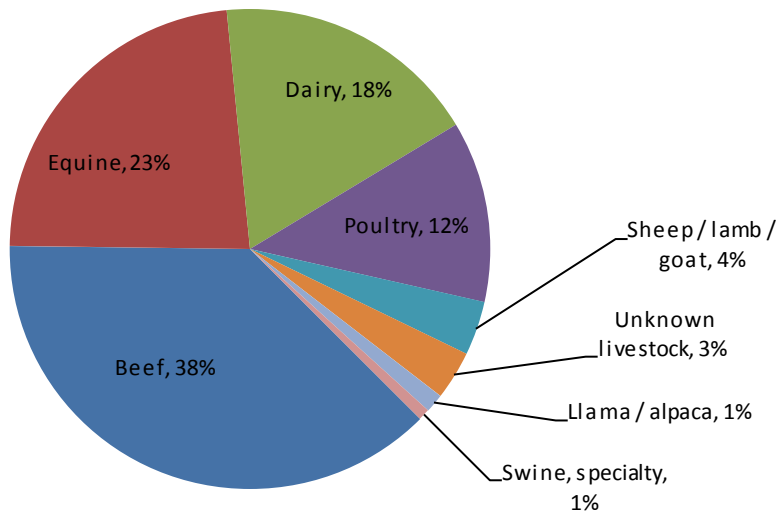


Figure 16 illustrates the proportion of livestock in RDNO by estimated animal unit equivalents. This unit of measure better reflects livestock distribution than the number of activities.

When using estimated AUEs, 38% of livestock are beef, 23% are equine, and 18% are dairy.

Figure 17. Estimated animal unit equivalents by livestock type and intensity

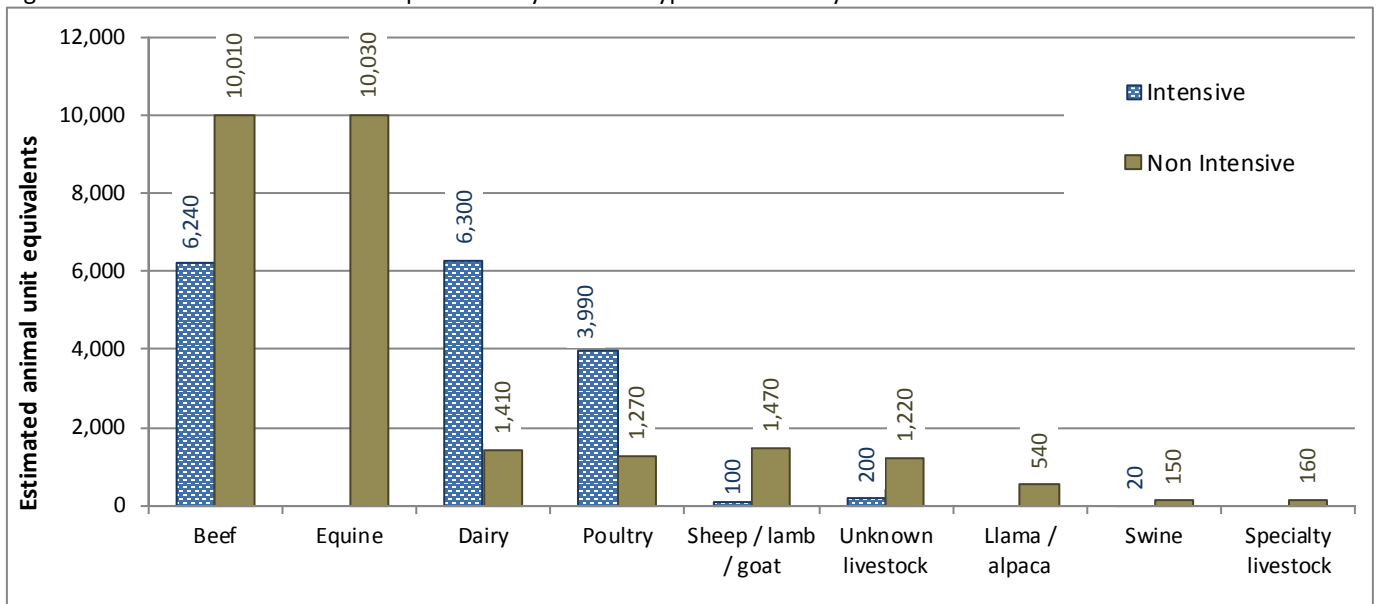


Figure 17 illustrates the number of estimated animal unit equivalents by livestock type and intensity in RDNO. The majority of all dairy and poultry animals are found in “intensive” facilities with specialized infrastructure designed for confined feeding at higher stocking densities.

All equines and most beef cattle are found in “non-intensive” facilities.



Figure 18. Estimated animal unit equivalents by livestock type and scale

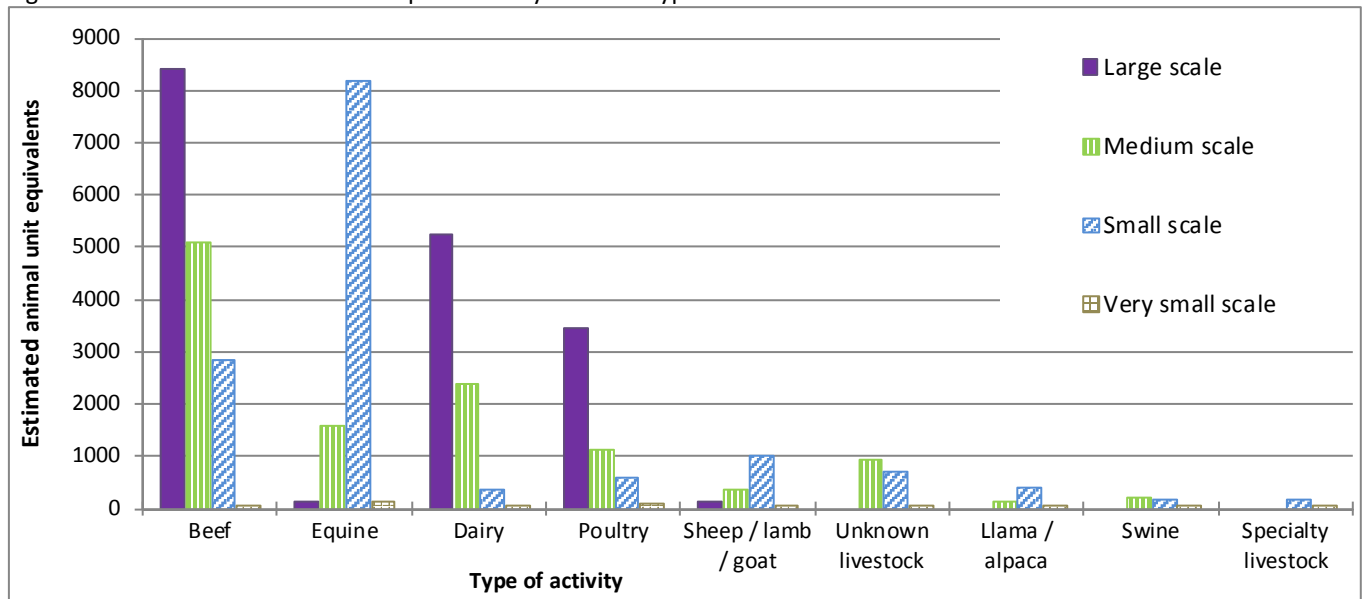


Figure 18 illustrates the number of estimated animal unit equivalents by scale and livestock type in RDNO. The majority of all beef, poultry and dairy animals are found in “large” or “medium” scale operations. Most equines are in “small” scale operations with 2 -25 animals.

Table 13. Estimated animal unit equivalents by livestock type and jurisdiction

| Jurisdiction          | Type of livestock activity |               |              |              |                     |                   |                |            |                     | Estimated animal unit equivalents |
|-----------------------|----------------------------|---------------|--------------|--------------|---------------------|-------------------|----------------|------------|---------------------|-----------------------------------|
|                       | Beef                       | Equine        | Dairy        | Poultry      | Sheep / lamb / goat | Unknown livestock | Llama / alpaca | Swine      | Specialty livestock |                                   |
| Spallumcheen          | 3,970                      | 3,100         | 3,400        | 4,070        | 500                 | 120               | 40             | 50         | 40                  | 15,290                            |
| Area D                | 4,220                      | 1,760         | 840          | 400          | 420                 | 440               | 110            | 30         | 10                  | 8,230                             |
| Area F                | 1,850                      | 1,370         | 3,350        | 390          | 210                 | 350               | 90             | 80         | 50                  | 7,740                             |
| Coldstream            | 3,010                      | 1,690         | 10           | 240          | 260                 | 90                | 110            | -          | 60                  | 5,470                             |
| Area B                | 1,290                      | 630           | -            | 40           | 70                  | 40                | 80             | -          | -                   | 2,150                             |
| Area C                | 470                        | 840           | -            | 80           | 40                  | 110               | 120            | -          | -                   | 1,660                             |
| Area E                | 920                        | 330           | 90           | 30           | 40                  | 230               | -              | 10         | -                   | 1,650                             |
| Vernon                | 380                        | 220           | 10           | 10           | 30                  | 30                | -              | -          | -                   | 680                               |
| Armstrong             | 60                         | 80            | -            | -            | -                   | -                 | -              | -          | -                   | 140                               |
| Enderby               | 80                         | 10            | -            | -            | -                   | 10                | -              | -          | -                   | 100                               |
| <b>ESTIMATED AUEs</b> | <b>16,250</b>              | <b>10,030</b> | <b>7,700</b> | <b>5,260</b> | <b>1,570</b>        | <b>1,420</b>      | <b>550</b>     | <b>170</b> | <b>160</b>          | <b>43,110</b>                     |

Table 13 details number of estimated animal unit equivalents by livestock type and jurisdiction. Spallumcheen has the highest numbers of estimated animal unit equivalents.

Figure 19. Estimated animal unit equivalents by jurisdiction

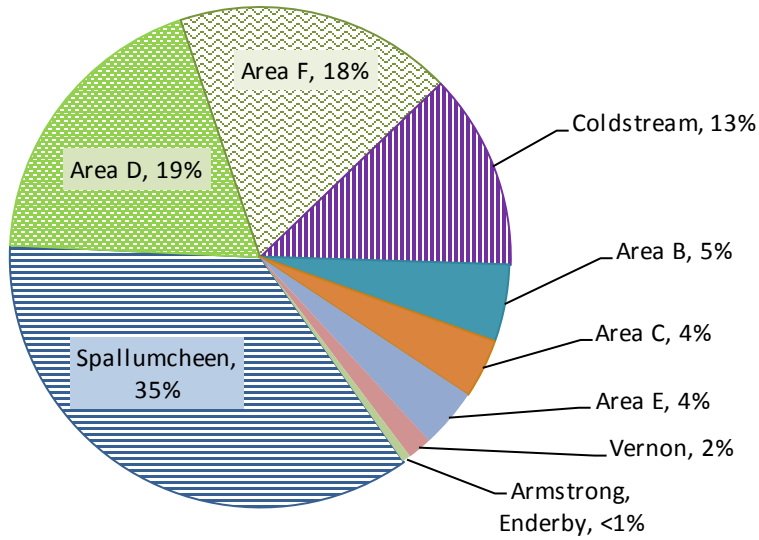
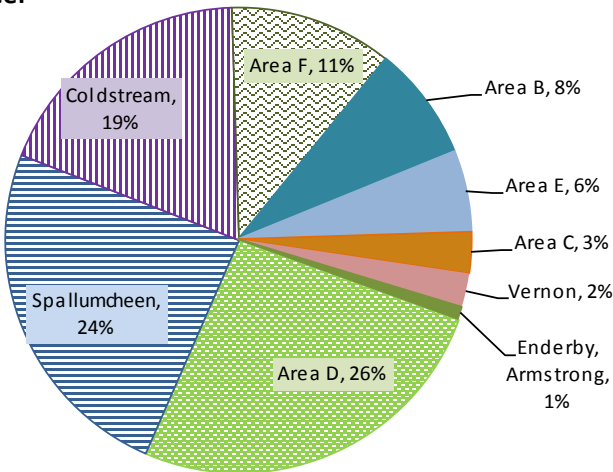


Figure 19 illustrates the proportion of estimated animal unit equivalents by jurisdiction.

The estimated animal unit equivalents in Spallumcheen, Area D, Area F, and Coldstream account for 85% of all livestock in RDNO.

Figure 20. Beef and equine estimated animal unit equivalents by jurisdiction

**Beef**



**Equine**

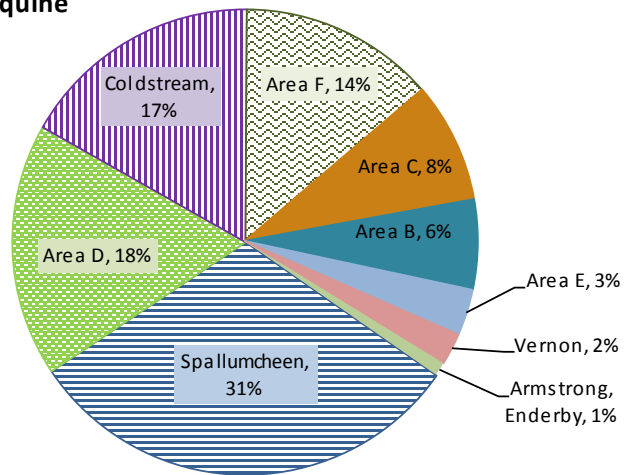


Figure 20 illustrates the proportion of beef and equine estimated animal unit equivalents by jurisdiction.

For both beef and equine, 80% of the estimated animal unit equivalents occurs within Spallumcheen, Coldstream, Area D, and Area F.

Figure 21. Poultry and dairy estimated animal unit equivalents by jurisdiction

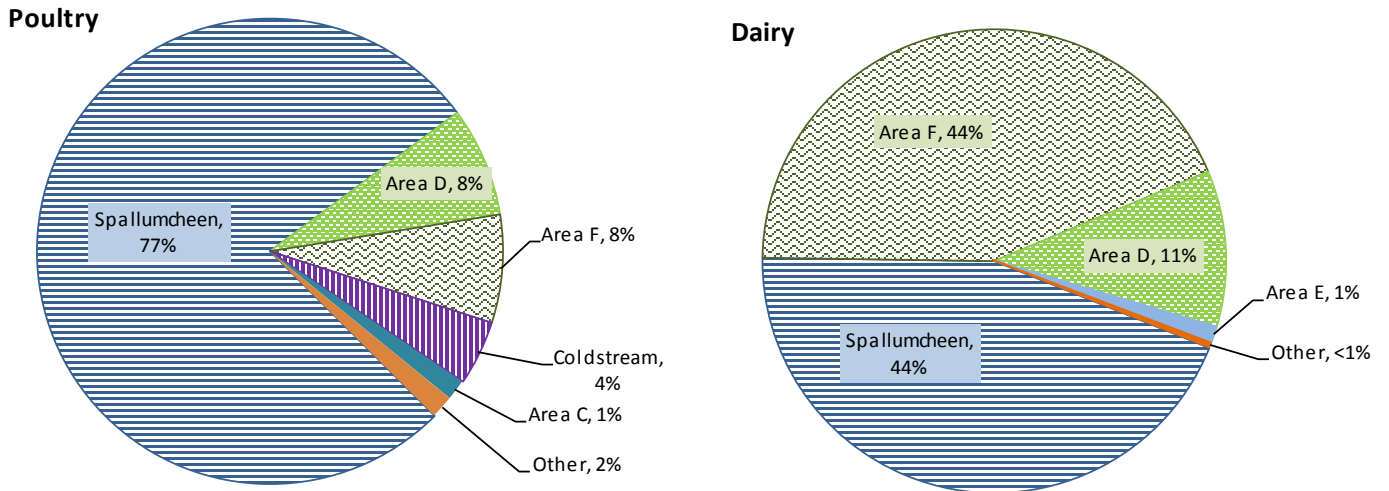


Figure 21 illustrates the proportion of poultry and dairy estimated animal unit equivalents by jurisdiction. The majority of the poultry occurs in Spallumcheen. Ninety-nine percent (99%) of the dairy estimated AUEs occur in 3 jurisdictions: Spallumcheen, Area F, and Area D.

### Number of livestock activities (occurrences)

Figure 22. Number of livestock activities by scale

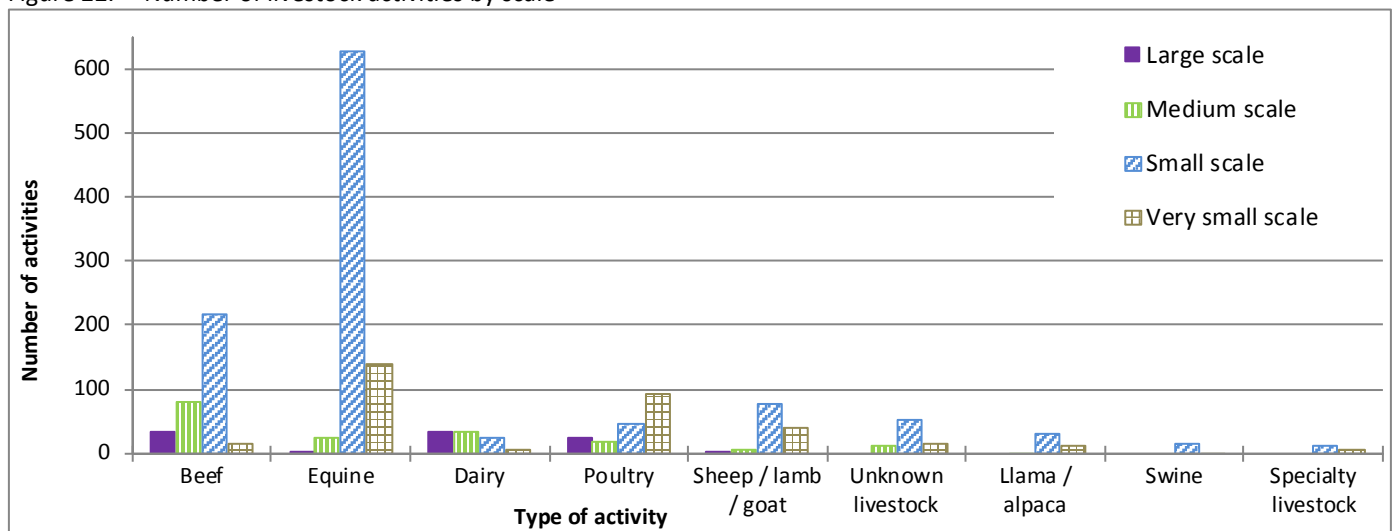


Figure 22 illustrates the number of livestock activities by scale and livestock type in RDNO. Equine activities occur the most frequently, however, nearly all occurrences are “small” or “very small” scale with less than 25 animals.

Figure 23. Number of large and medium scale livestock activities by jurisdiction

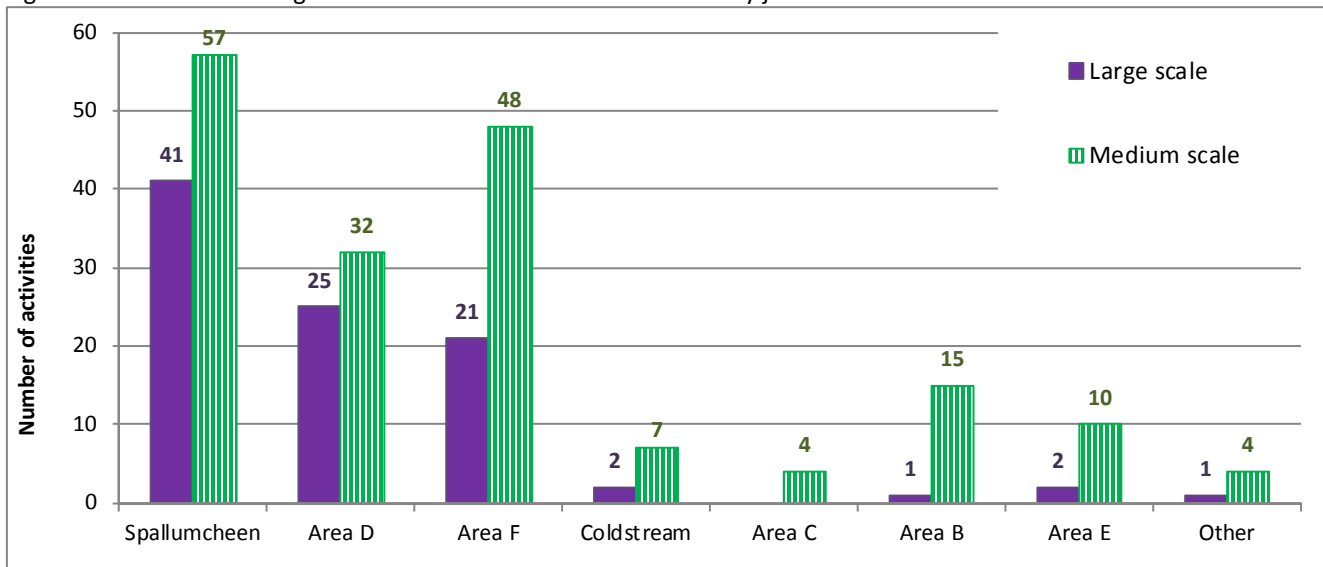


Figure 23 illustrates the distribution of “medium” and “large” scale livestock activities in RDNO. The majority of all “large” and “medium” scale activities occur within Spallumcheen, Area D and Area F.

## 5. ALR Utilization

### 5.1 PARCEL INCLUSION IN THE ALR

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

Figure 24 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.

To achieve an accurate picture of the ALR in RDNO, only parcels that meet the following criteria are included in this section of the report:

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

In total, 5118 parcels, with 54,189 or 98% of the effective ALR met the above criteria and were included in the further analysis of the ALR. 'Effective ALR' is the total ALR area excluding land outside of legally surveyed parcels and land on Indian reserves.

Figure 24. Parcel inclusion in the ALR

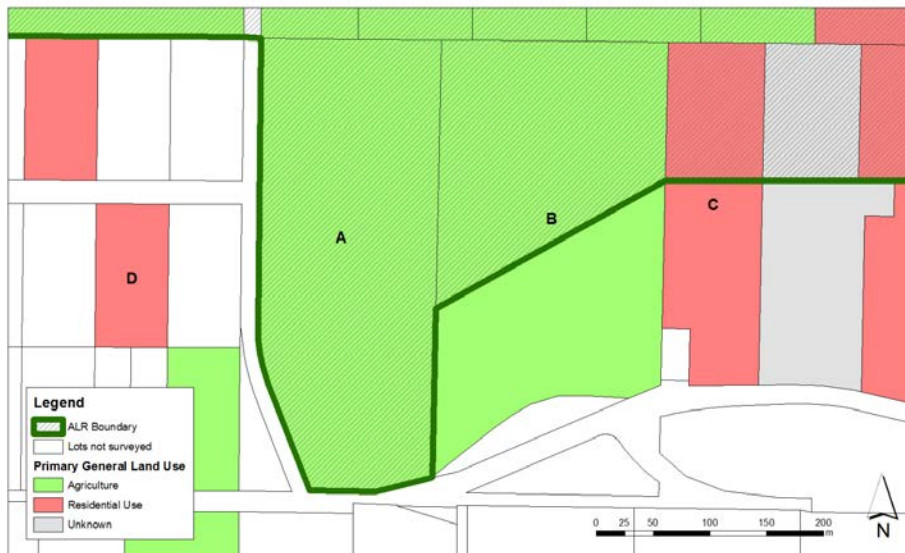


Figure 24 illustrates the distinction between parcels considered to be within or outside the ALR:

**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 ha in the ALR
- lot D is completely outside the ALR.

## 5.2 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. Another example is commercial land use; if one parcel is a hotel, another is a retail store, and a third is a gas station, all are considered to have commercial land use.

Up to two general land uses (e.g. residential, commercial, protected area) are recorded for each parcel. Evaluation of land uses are based on the overall economic importance and/or the extent of the land use.

**Used for farming** – Parcels where the majority of the parcel area is utilized for farming or parcels which exhibit significant evidence of intensive farming. Refer to the glossary for a complete definition. Many “Used for farming” parcels are also used for other purposes such as residential. This report does not attempt to determine which use is primary.

**Not used for farming** – Parcels that do not meet the “Used for farming” definition.

**Used for grazing** – Parcels that do not meet the “Used for farming” criteria, but have a significant portion of their area in natural pasture or rangeland and have evidence of active grazing domestic livestock.

Table 14. Land use and farming use in the ALR

| Parcel land use*                             |                                 | Number of ALR parcels | % of ALR parcels | Average parcel size (ha) | Median parcel size (ha) |
|--|---------------------------------|-----------------------|------------------|--------------------------|-------------------------|
| Used only for farming - no other use         |                                 | 541                   | 11%              | 15                       | 4.6                     |
| Used for farming - Mixed use                 | Residential                     | 1,801                 | 35%              | 14                       | 4.8                     |
|  | Industrial                      | 21                    | < 1%             | 45                       | 18.5                    |
|  | Transportation & utilities      | 24                    | < 1%             | 18                       | 13.1                    |
|  | Recreation                      | 7                     | < 1%             | 28                       | 19.8                    |
|  | Forestry                        | 2                     | < 1%             | 86                       | 86.3                    |
|  | Other                           | 16                    | < 1%             | 8                        | 4.1                     |
| <b>USED FOR FARMING SUBTOTAL</b>             |                                 | <b>2,412</b>          | <b>47 %</b>      | <b>15</b>                | <b>4.8</b>              |
| Used only for grazing - no other use         |                                 | 8                     | < 1%             | 22                       | 3.7                     |
| Used for grazing                             | Residential                     | 23                    | < 1%             | 15                       | 4.8                     |
|  | Forestry                        | 2                     | < 1%             | 49                       | 49.0                    |
| <b>USED FOR GRAZING SUBTOTAL</b>             |                                 | <b>33</b>             | <b>1 %</b>       | <b>19</b>                | <b>4.8</b>              |
| Not used for farming                         | Residential                     | 1,826                 | 36%              | 5                        | 1.2                     |
|  | No apparent use                 | 580                   | 11%              | 24                       | 4.6                     |
|  | Transportation & utilities      | 74                    | 1%               | 28                       | 1.9                     |
|  | Industrial                      | 56                    | 1%               | 14                       | 3.7                     |
|  | Other                           | 45                    | < 1%             | 4                        | 1.0                     |
|  | Forestry                        | 41                    | < 1%             | 68                       | 64.4                    |
|  | Recreation                      | 21                    | < 1%             | 13                       | 2.7                     |
|  | Protected area / park / reserve | 18                    | < 1%             | 72                       | 7.0                     |
|  | Golf                            | 10                    | < 1%             | 36                       | 34.1                    |
| Military                                     | 2                               | < 1%                  | 156              | 155.6                    |                         |
| <b>NOT USED FOR FARMING/GRAZING SUBTOTAL</b> |                                 | <b>2,673</b>          | <b>52 %</b>      | <b>12</b>                | <b>2.0</b>              |
| <b>TOTAL</b>                                 |                                 | <b>5,118</b>          | <b>100 %</b>     | <b>13</b>                | <b>3.7</b>              |

\* See "Land Use" in the glossary for terms in this table.

Table 14 shows the number of ALR parcels that are “Used for farming” and “Not used for farming” by land use in RDNO.

In total, 47% of the ALR parcels (2,412 parcels) are “Used for farming” and 52% (2,673 parcels) are “Not used for farming”. The “Used for farming” parcels have an average parcel size of 15 ha while the “Not used for farming” parcels are somewhat smaller and have an average parcel size of 12 ha.

Figure 25 provides more information on “Used for farming” parcels and Figure 26 provides more information on “Not used for farming” parcels.

Figure 25. Proportion of “Used for farming” ALR parcels by land use

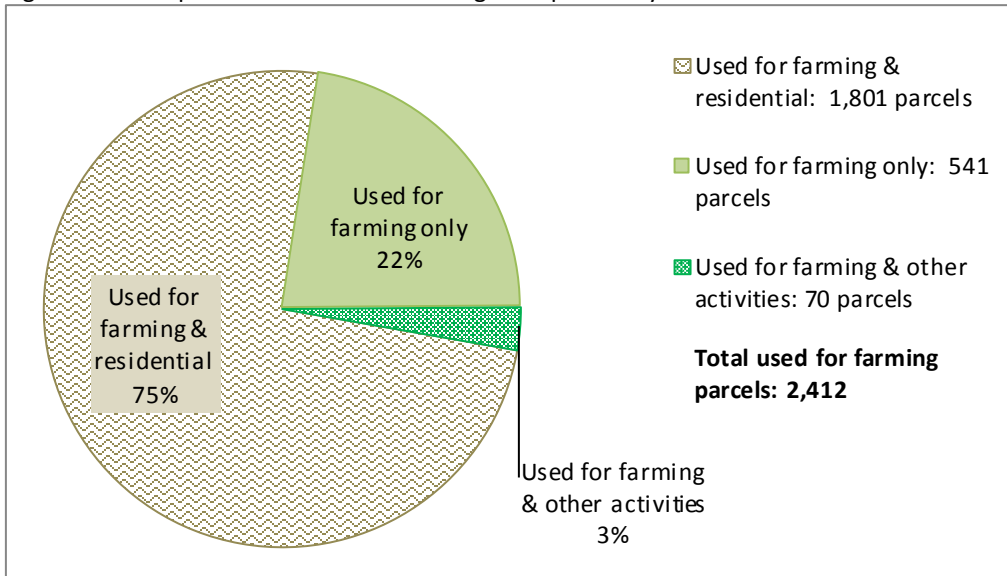


Figure 25 illustrates the proportion of “Used for farming” ALR parcels by their land use.

Seventy-five percent of the ALR parcels that are “Used for farming” are also used for residential purposes.

Another 22% of the “Used for farming” parcels are exclusively used for agriculture, with no other uses.

Figure 26. Proportion of “Not used for farming” ALR parcels by land use

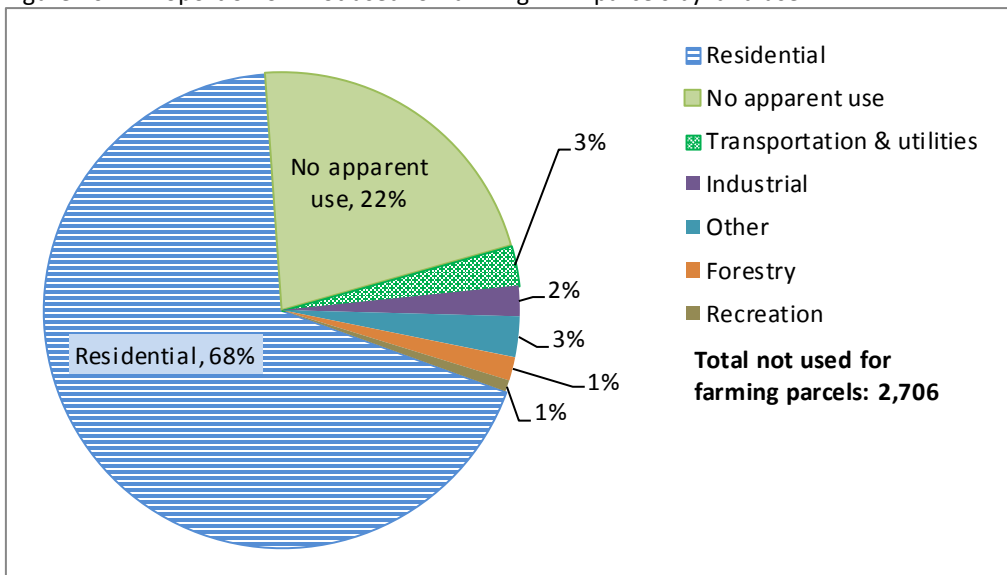


Figure 26 illustrates the proportion of “Not used for farming” ALR parcels by their land use.

The largest proportion of all “Not used for farming” ALR parcels (71%) have a residential use.

Parcels “Used for grazing” are included in “Not used for farming”.

### 5.3 RESIDENTIAL USE

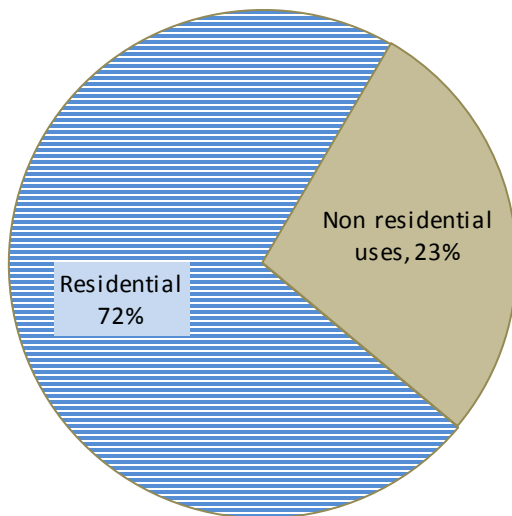
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The ALR is a provincial zone in which agriculture is the priority use and some residential use is considered a necessary accessory to the agricultural use of a property. However, residential use which is not an accessory to agriculture can effectively 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, odour, or dust from neighbouring farm operations.

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

In the following analysis cabins/cottages, mobile homes, single-family houses, duplexes, townhouses, apartments, dormitories, and institutional living buildings are included.

Figure 27. Residential land use on parcels in the ALR



*Figure 27 shows that 72% of all ALR parcels are used for residential purposes. These parcels may also have other land uses and/or farming activities on them.*

*The size and placement of residential footprints can impact the suitability of the remaining parcel area to be used for farming purposes.*



Figure 28. Farming status of parcels in the ALR with residential land use

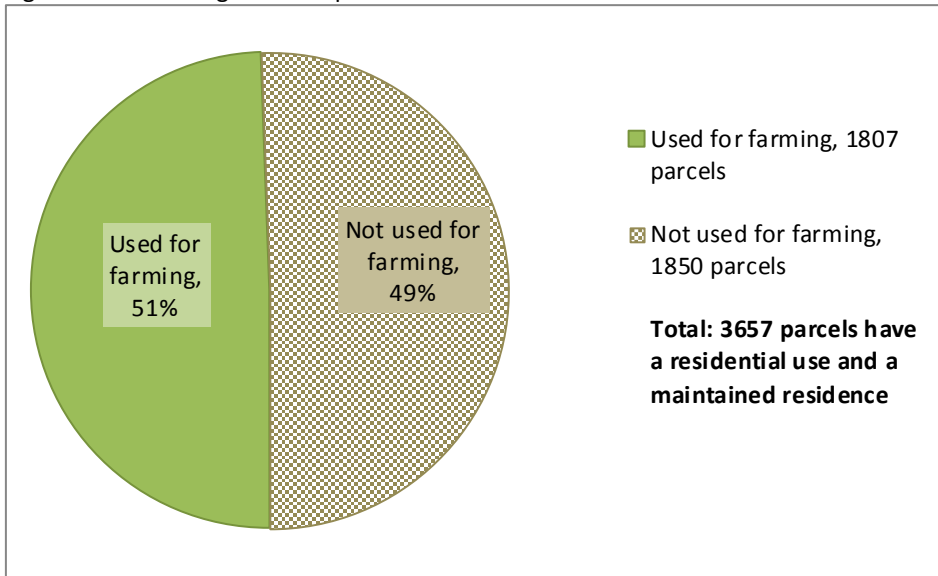


Figure 28 illustrates the proportion of ALR parcels with a maintained residence by farming status.

In total, 51% of all ALR parcels with a residence are “Used for farming”.

Forty-nine percent of the ALR parcels with a residence are “Not used for farming”. If the assumption is made that most farmers do not leave agricultural land idle, this could indicate that there is a significant proportion of non-farming land owners living in the ALR.

This chart represents all ALR parcels with a residence. The residential land use may be secondary or ancillary and may not be categorized as residential in Table 14

## Residential footprint

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 yards), are assigned to the closest residence.

Figure 29. Average percent of parcel area in residential footprint by parcel size

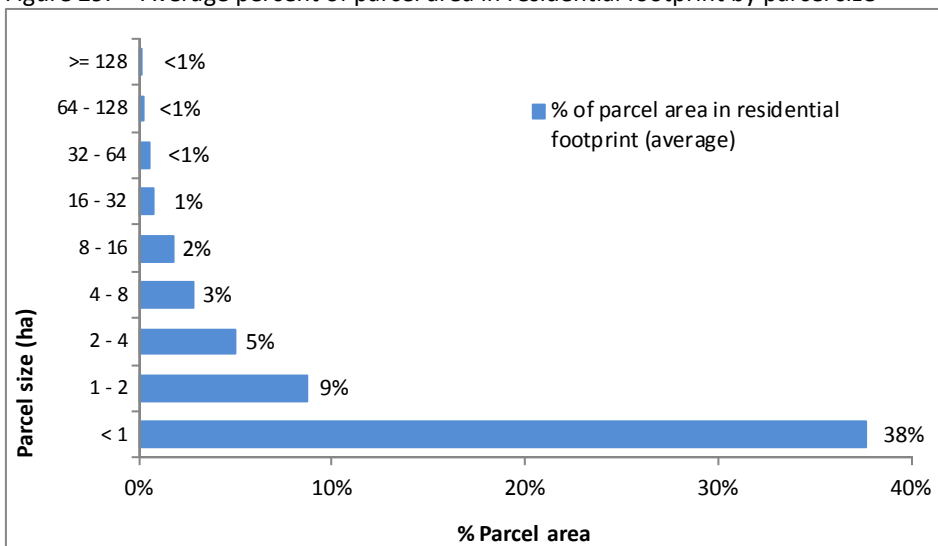


Figure 29 demonstrates that residential footprints on smaller parcels use a much greater proportion of the parcel area than those on larger parcels.

## 5.4 FARM USE & PARCEL SIZE

Parcel size must be considered when determining the agricultural potential of a parcel. Larger parcels usually allow farmers greater flexibility to expand or change their type of operation as the economy and markets change. Some types of agriculture can be successful on small parcels, (e.g. intensive market gardens, nurseries, poultry), however, the number of viable farming options generally decreases with a reduced parcel size. Small parcels may also be suitable for start-up farmers and established farmers wanting to expand through leases.

A farming operation may utilize more than one parcel as a farm unit<sup>7</sup>, however, it is generally more efficient to run a farm on fewer large parcels than on many small parcels. Smaller parcels are generally more costly per hectare than larger parcels and can easily be disassembled from larger farm units and sold. Larger parcels accommodate equipment more efficiently and reduce the need to move farm equipment on public roads. Furthermore, smaller parcels are more impacted by bylaws designed to reduce potential land use conflicts, such as setbacks from lot lines and road allowances.

Figure 30. Number of parcels in the ALR by farming status and parcel size

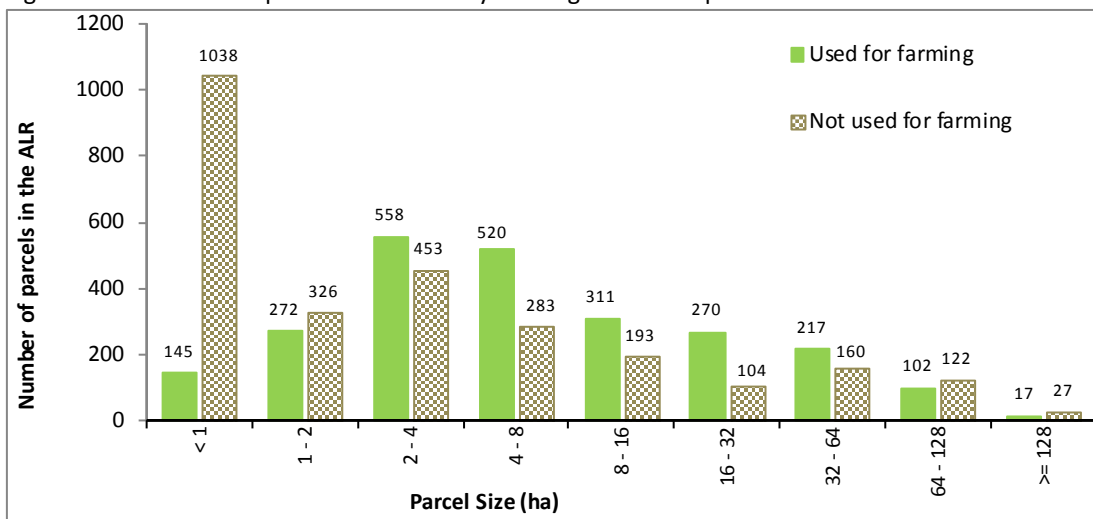


Figure 30 compares the distribution of “Used for farming” parcels with other parcels in the ALR.

The largest proportion of “Not used for farming” parcels occurs on parcels less than 1 ha. In total, 88% of all parcels less than 1 ha are “Not used for farming”. This indicates that small parcels are less likely to be “Used for farming”.

<sup>7</sup> Farm Unit – An area of land used for a farm operation consisting of one or more contiguous or non-contiguous parcels, that may be owned, rented or leased, which form and are managed as a single farm.

Table 15. Number of parcels in the ALR by farming status and jurisdiction

| Jurisdiction | Number of ALR parcels |                      |              | % of RDNO farmed parcels |
|--------------|-----------------------|----------------------|--------------|--------------------------|
|              | Used for Farming      | Not used for farming | Total Number |                          |
| Spallumcheen | 833                   | 529                  | 1362         | 35 %                     |
| Area F       | 397                   | 435                  | 832          | 16 %                     |
| Coldstream   | 365                   | 380                  | 745          | 15 %                     |
| Area D       | 251                   | 406                  | 657          | 10 %                     |
| Area C       | 168                   | 275                  | 443          | 7 %                      |
| Area B       | 146                   | 254                  | 400          | 6 %                      |
| Area E       | 122                   | 229                  | 351          | 5 %                      |
| Vernon       | 102                   | 173                  | 275          | 4 %                      |
| Armstrong    | 21                    | 18                   | 39           | 1 %                      |
| Enderby      | 6                     | 5                    | 11           | <1                       |
| Lumby        | 1                     | 2                    | 3            | <1                       |
| <b>TOTAL</b> | <b>2,412</b>          | <b>2,706</b>         | <b>5,118</b> | <b>100 %</b>             |

Table 15 details the number of “Used for farming” and “Not used for farming” parcels in RDNO’s ALR by jurisdiction.

Over one third (35%) of the “Used for farming” parcels occur in Spallumcheen.

Figure 31. Number of parcels in the ALR by farming status and jurisdiction

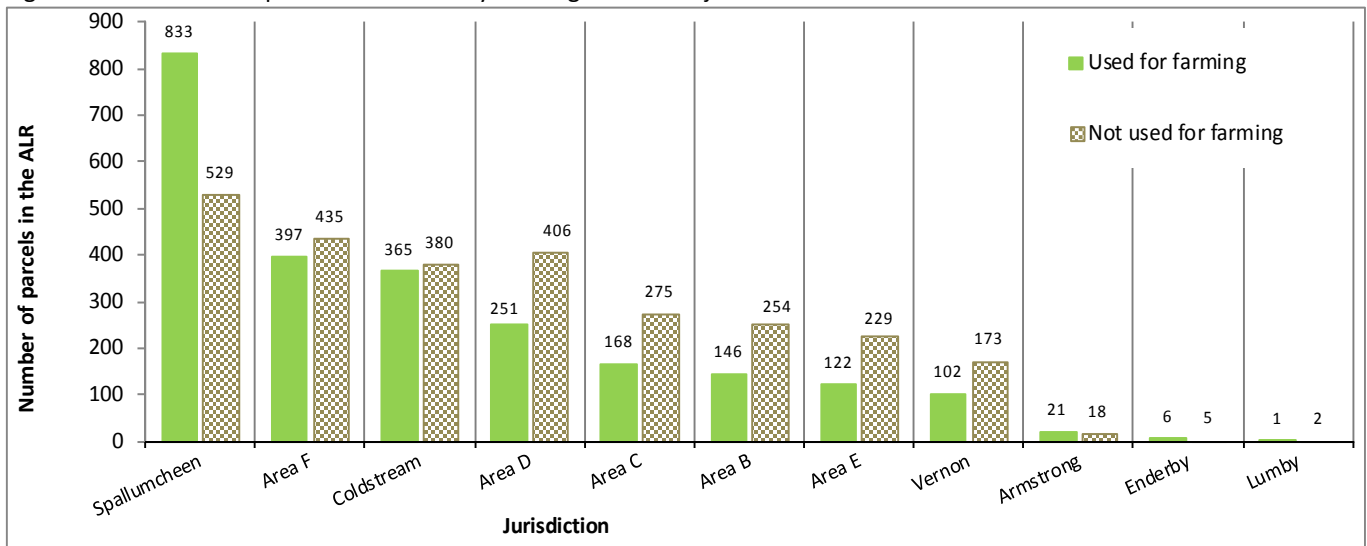


Figure 31 illustrates the number of parcels in the ALR by farming status and jurisdiction.

Spallumcheen and Armstrong are the only jurisdictions to have a higher proportion of “Used for farming” ALR parcels than “Not used for farming” ALR parcels.

## 6. ALR Availability for Farming

### 6.1 ALR PARCEL AVAILABILITY OVERVIEW

There is a strong demand for agricultural products produced in British Columbia. This demand is expected to increase with population growth<sup>8</sup>. Agricultural growth may have to take place on a fixed land base as lands that are suitable to increase output may not be available. Agricultural sectors that require large land bases may find it difficult to access land for farm expansion. Future agriculture growth may come from new commodity types and intensifying land use rather than finding new land for development.

The analysis in this section examines the characteristics of parcels that are used for farming, available for farming, and unavailable for farming.

**Used for farming** – Parcels where the majority of the parcel area is utilized for farming or parcels which exhibit significant evidence of intensive farming. Refer to the glossary for a complete definition.

**Not used for farming** – Parcels that do not meet the “Used for farming” definition. Includes parcels that are *available* and *unavailable* for farming.

**Unavailable for farming** – Parcels “not used for farming” where future agricultural development is improbable because of a conflicting land use or land cover that utilizes the majority of the parcel. E.g. land uses such as golf courses, schools, and small residential lots are considered incompatible with agriculture. These properties may be altered in a way that is incompatible with agriculture, may have little land available, and/or tend to have very high land values. It is usually uneconomical for a farmer to acquire and convert these properties to farmland given the limited potential for farming. Also, if there is insufficient land available on a parcel with an existing non-farm use, it will not likely be considered for lease by farmers.

**Available for farming** – Parcels “not used for farming” that either have some agricultural activity, no apparent land use, or an existing land use that is compatible with agriculture, such as residential. Available for farming parcels must have 0.4 ha and at least 50% of the parcel area in land cover that is available and has potential for farming. Areas considered to have potential for farming include:

- natural and semi-natural vegetation,
- areas in managed vegetation (managed for landscaping, dust or soil control), and
- non-built or bare areas

Areas considered to have no potential for farming include:

- built structures
- fill piles
- wetlands and waterbodies

It is assumed these areas would not likely be removed or filled in to create land with cultivation potential. In addition, areas with steep slopes, rocky soils or operational constraints such as a very small size are considered to have limited potential for farming and are excluded from the available land cover.

It is assumed that any existing non-farm land uses will not be displaced by agriculture expansion.

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<sup>8</sup> 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 16. Farm and availability status of parcels in the ALR

| Parcel status with respect to farming | Number of parcels | % of parcels in the ALR | Total ALR area (ha)* |
|---------------------------------------|-------------------|-------------------------|----------------------|
| Used for farming                      | 2,412             | 47 %                    | 32,019               |
| Unavailable for farming               | 1,830             | 36 %                    | 16,304               |
| Available for farming                 | 876               | 17 %                    | 5,865                |
| <b>TOTAL</b>                          | <b>5,118</b>      | <b>100 %</b>            | <b>54,189</b>        |

\* This is the total ALR area on the parcel. The entire area may not be farmed or available for farming.

Table 16 demonstrates that of the 5,118 parcels in the ALR, nearly half (47%) are "Used for farming".

Thirty-six percent (36%) of the ALR parcels are unavailable for farming and 17% are potentially available for agricultural expansion.

Figure 32. Proportion of ALR parcels by farming availability and jurisdiction

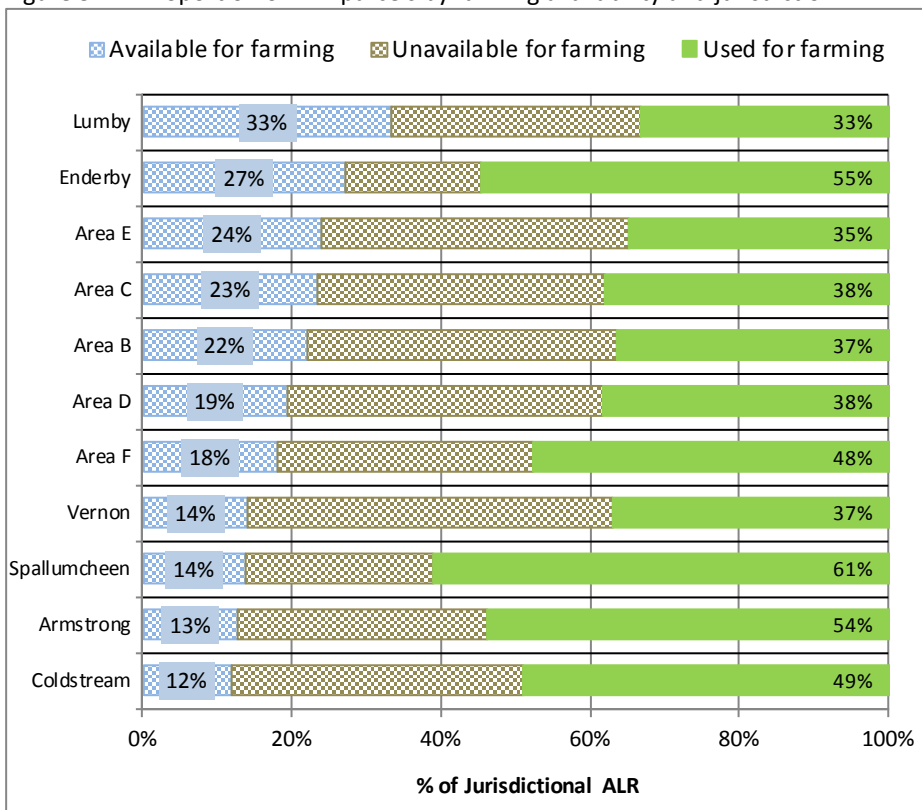


Figure 32 compares the proportion of ALR parcels available for farming across jurisdictions.

Lumby and Enderby have the largest proportions of their ALR parcels available for farming.

It should be noted that Lumby, has only 3 ALR parcels: 1 is available for farming, 1 is unavailable for farming and 1 is "Used for farming".

## 6.2 ON PARCELS USED FOR FARMING

Parcels that are “Used for farming” do not always utilize 100% of their land area for agricultural purposes. Some areas may have limited potential for farming due to steep slopes, rocky soils or other operational constraints. Areas in natural and semi-natural vegetation or in anthropogenic managed vegetation may be available to bring into agricultural production. Some of these areas may be amalgamated into existing fields or may already be used for natural grazing. If the assumption is made that farmers generally do not leave productive land idle, it may indicate that these areas are serving a purpose that was not apparent during the field survey (e.g. wildlife habitat, stream buffers), or may have an unobserved physical limitation (e.g. soils, drainage).

Although there is some available land cover on “Used for farming” parcels, these areas are generally small and offer little opportunity to increase the overall amount of farmed area in RDNO. In addition, these areas do not represent parcels available to new farming entrants.

The size distribution of “Used for farming” parcels is detailed in Figure 30. Refer to Figure 25 for details on land use on “Used for farming” parcels.

Figure 33. Proportion of land cover categories on “Used for farming” parcels in the ALR

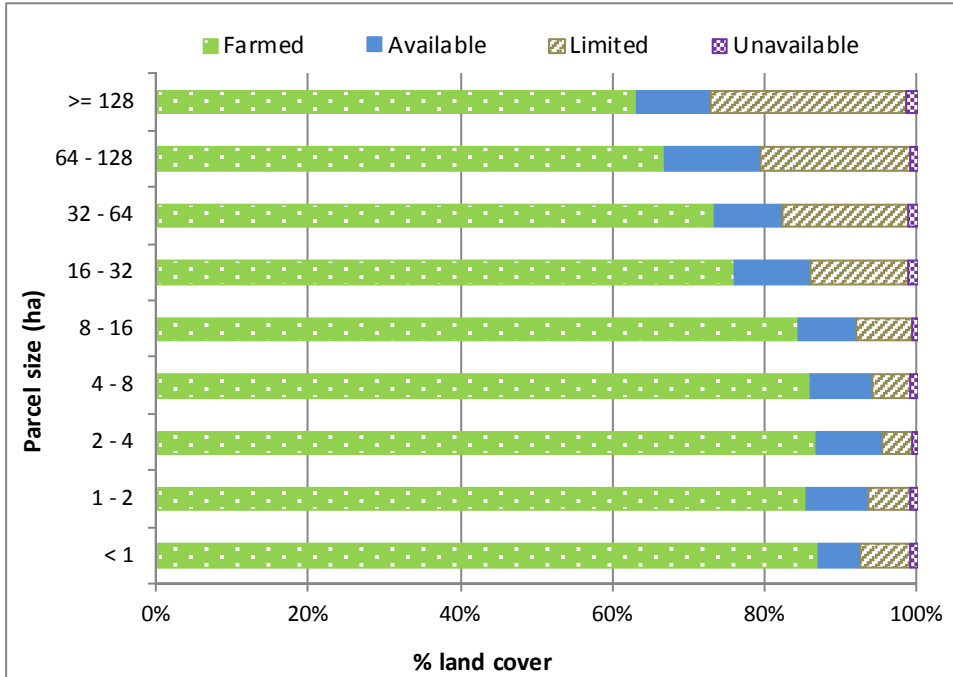


Figure 33 illustrates the proportion of land cover categories on parcels that are already “Used for farming”.

In general, the opportunities to expand agriculture on these parcels is limited. Only 10% of the total area on parcels “Used for farming” is considered available for farming expansion. The majority of these available areas are in natural and semi-natural vegetation (refer to Figure 35).

Figure 34. Size of available areas on “Used for farming” parcels in the ALR

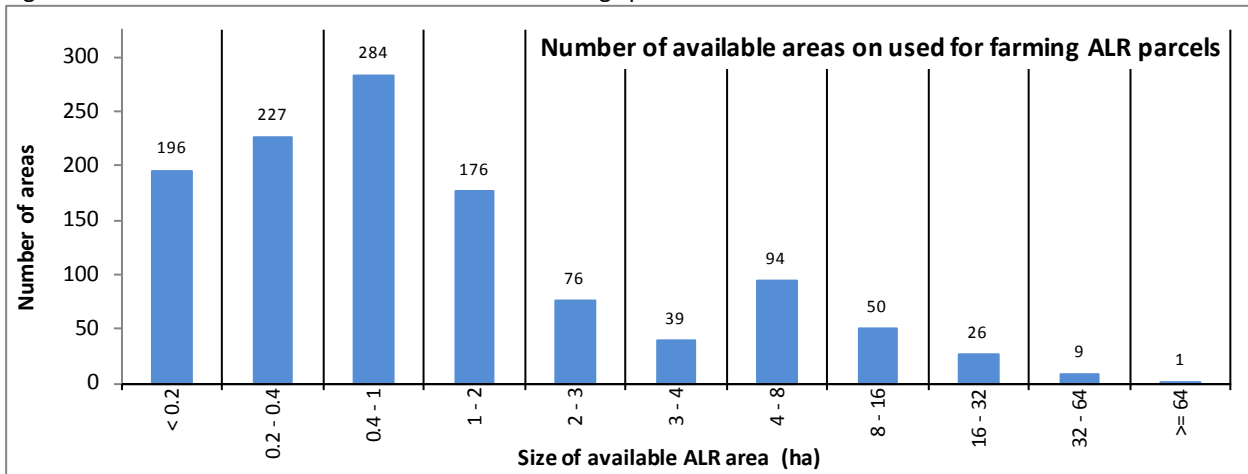


Figure 34 illustrates the size of the areas available for farming on “Used for farming” parcels. Most areas are small with 75% of the available land cover areas being less than 2 ha. These areas would have little influence on increasing the total area under cultivation. Furthermore, the cost of improving these small areas to bring them into agricultural production may not be cost effective.

Figure 35. Available for farming land cover types on “Used for farming” parcels in the ALR

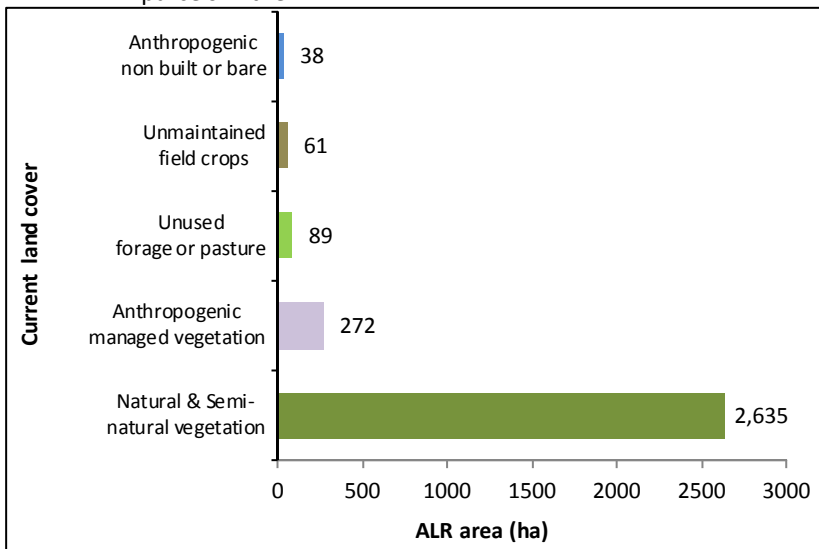


Figure 35 shows the type of land cover on available for farming ALR land on parcels that are already “Used for farming”.

Land currently in “Natural & Semi-natural” vegetation could provide the greatest gains in cultivated land.

Most land in “Natural & Semi-natural” land cover is treed (72% or 1,893 ha out of 2,635 ha) and would need to be cleared before cultivation could begin.

Any increase in agriculture would have to be measured against ecological values such as wildlife habitat and societal values such as privacy.

### 6.3 ON PARCELS AVAILABLE FOR FARMING

ALR parcels that are available for farming offer the greatest potential for agricultural expansion. These parcels are a subset of the “Not used for farming” parcels described in Section 5. For a parcel to be considered available for farming it:

- Must not already be “Used for farming”
- Must not have an existing use that excludes agricultural development (e.g. parks, golf courses)
- Must have at least 50% of the parcel area and at least 0.4 ha in land that is available for farming

Figure 36. Proportion of land cover categories on available for farming parcels in the ALR

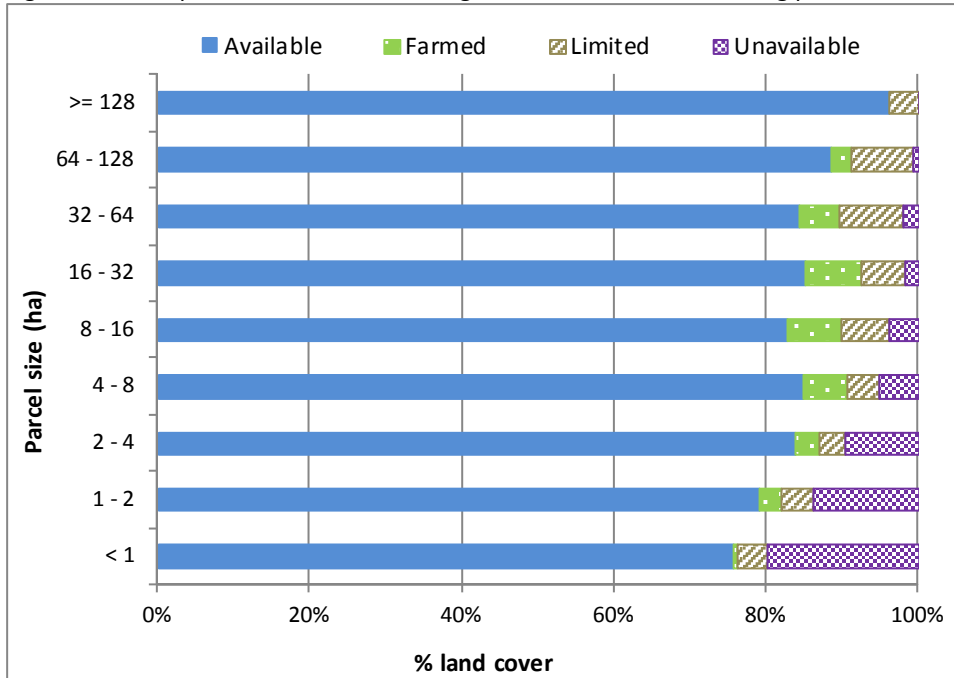


Figure 36 illustrates the proportion of land cover categories on parcels that are available for farming.

In general, these parcels have a large proportion of their area in land cover that is available for farming. These parcels offer the greatest potential to increase agricultural production in the future.

In addition, there is very little land constrained by physical limitations (e.g. soils, slope), on these parcels.

Figure 37. Size of available areas on available for farming parcels in the ALR

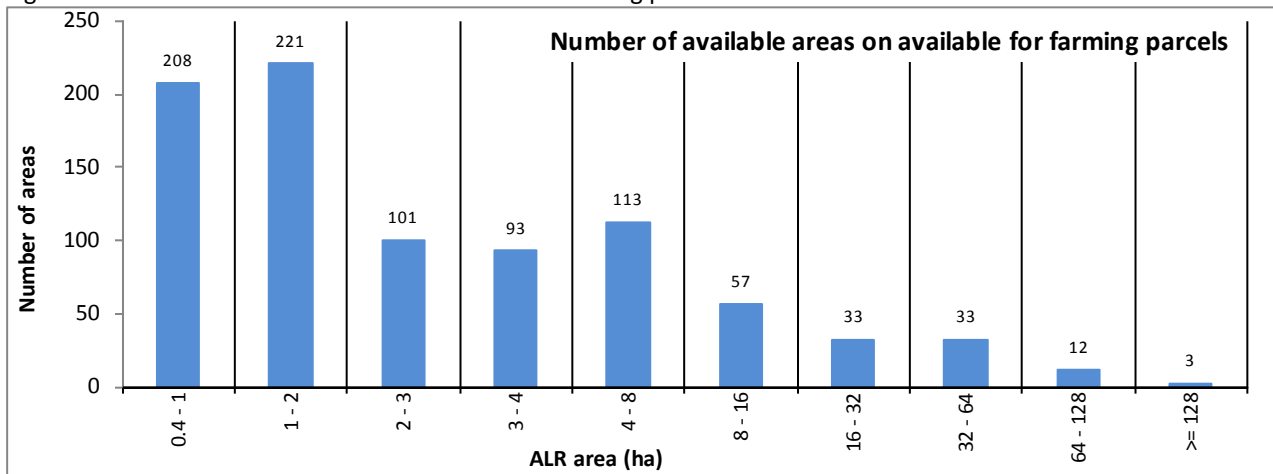


Figure 37 illustrates the size of the available areas on parcels that are considered available for farming. Of these areas:

- 24% are less than 1 ha (208 areas)
- 49% are less than 2 ha (429 areas)
- 71% are less than 4 ha (623 areas)
- 29% are greater than 4 ha (251 areas)

Refer to Figure 39 for the size of parcels in the ALR that are available for farming.



Figure 38. Available for farming land cover types on available parcels in the ALR

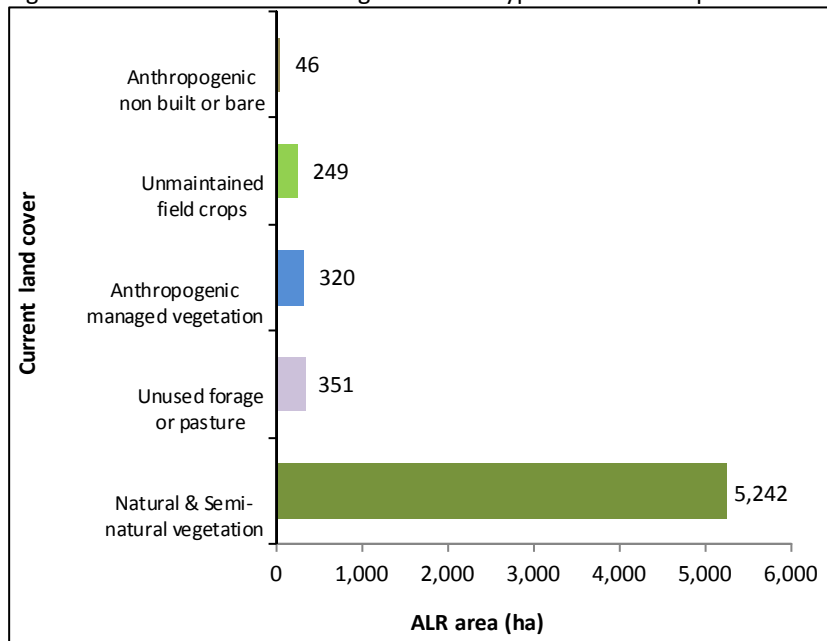


Figure 38 shows the type of land cover on available ALR land on parcels that are available for farming.

Land currently in “Natural & Semi-natural” vegetation could provide the greatest gains in cultivated land.

The majority of the land in “Natural & Semi-natural” land cover is treed (61% or 3,200 ha out of 5,242 ha) and would need to be cleared before cultivation could begin. The remaining natural vegetation is in grass, herbs, and shrubs.

These gains in agriculture would have to be measured against ecological values such as wildlife habitat and societal values such as privacy.

Figure 39. Ownership and parcel size distribution on available for farming parcels in the ALR

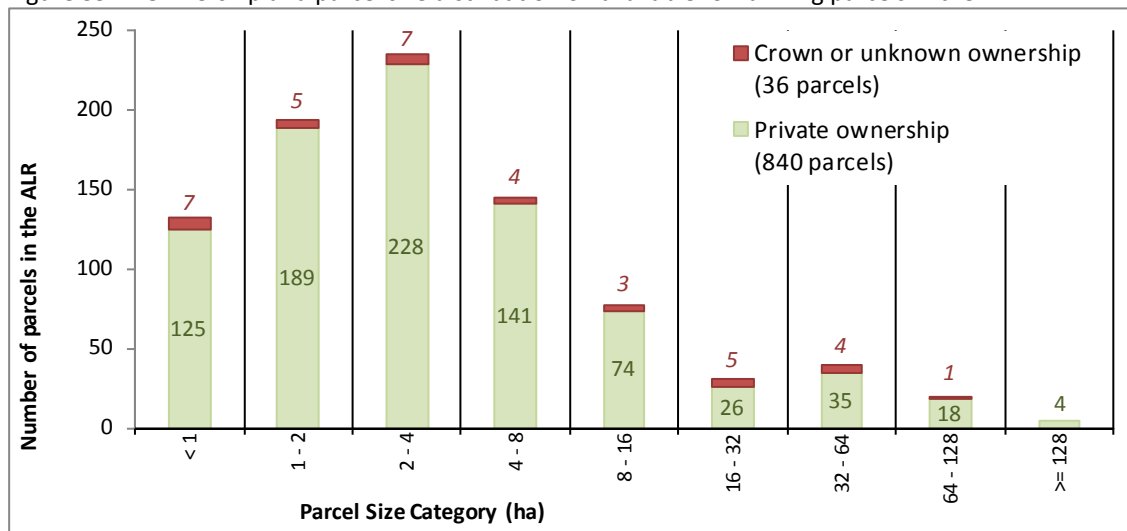


Figure 39 shows the number of ALR parcels that are available for farming by parcel size and ownership type. In total, there are 876 ALR parcels considered available for farming. These parcels may provide opportunities to expand agriculture in the region. Of the available parcels:

- 326 parcels (37%) are less than 2 ha
- 561 parcels (64%) are less than 4 ha
- 315 parcels (36%) are greater than 4 ha
- 93 parcels (11%) are greater than 16 ha

The land uses on these parcels are shown in Figure 40 and Figure 41.

Figure 40. Land uses and parcel size distribution on available for farming parcels in the ALR

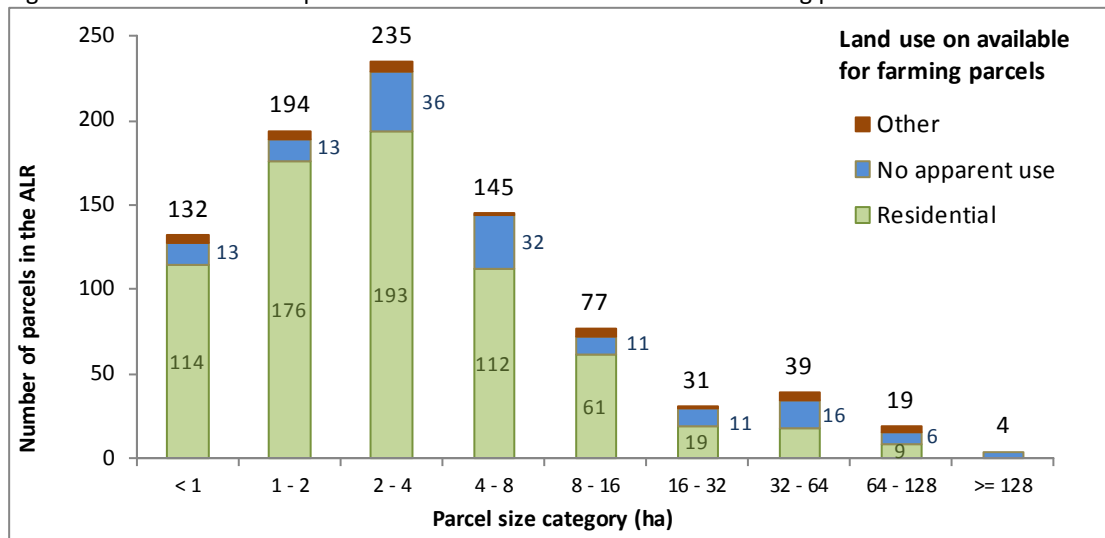


Figure 40 depicts the existing land uses on parcels in the ALR that are available for farming. In total, 81% of the available parcels have a residential land use, 14% have no apparent use, and the remaining 5% have other uses including gravel extraction, utilities, and industrial.

Figure 41. Parcel size distribution of available for farming parcels in the ALR with no apparent use

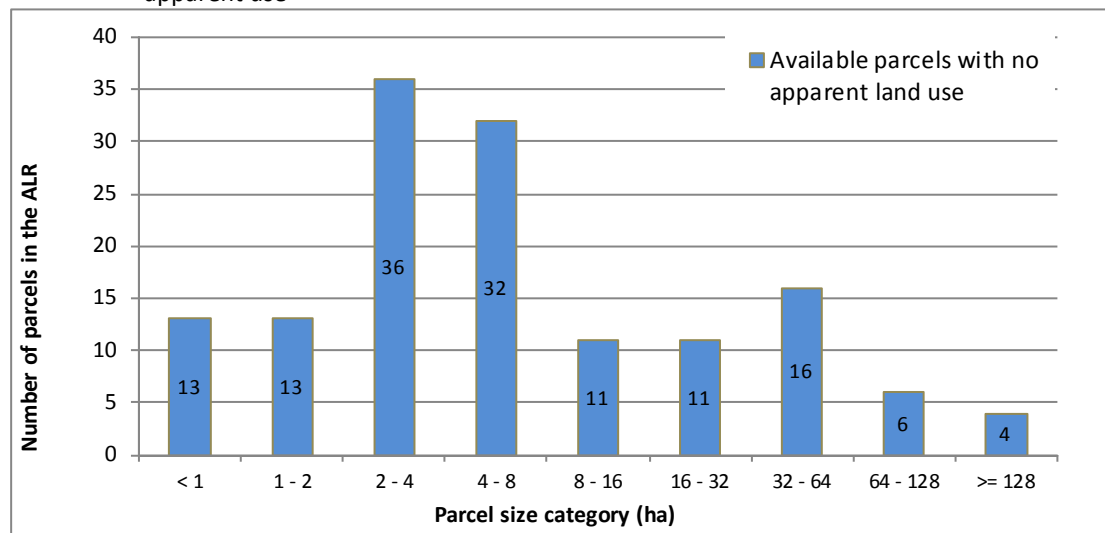


Figure 41 shows the number of ALR parcels that are available for farming and that have no apparent land use. Of these 142 parcels:

- 26 parcels are less than 2 ha
- 62 parcels are less than 4 ha
- 80 parcels are greater than 4 ha
- 37 parcels are greater than 16 ha

## Available Parcels By Jurisdiction

Table 17. Available for farming parcels in the ALR by jurisdiction

| Jurisdiction | Parcels not used for farming with > 50% of their total area in ALR land available and with potential for farming |                        |                            |                          |                         |
|--------------|--|------------------------|----------------------------|--------------------------|-------------------------|
|              | Number of ALR parcels  | % of available parcels | Potential for farming (ha) | Average parcel size (ha) | Median parcel size (ha) |
| Spallumcheen | 187  | 21 %                   | 790                        | 6                        | 2.2                     |
| Area F       | 150  | 17 %                   | 731                        | 6                        | 2.9                     |
| Area D       | 127  | 14 %                   | 1,585                      | 19                       | 5.7                     |
| Area C       | 104  | 12 %                   | 207                        | 3                        | 1.9                     |
| Coldstream   | 88   | 10 %                   | 241                        | 5                        | 2.1                     |
| Area B       | 88   | 10 %                   | 781                        | 15                       | 2.2                     |
| Area E       | 84   | 10 %                   | 472                        | 8                        | 4.1                     |
| Vernon       | 39   | 4 %                    | 156                        | 5                        | 2.2                     |
| Armstrong    | 5  | <1 %                   | 17                         | 4                        | 2.2                     |
| Enderby      | 3  | <1 %                   | 4                          | 1                        | 1.6                     |
| Lumby        | 1  | <1 %                   | 15                         | 15                       | 15.5                    |
| <b>TOTAL</b> | <b>876</b>   | <b>100 %</b>           | <b>5,000</b>               | <b>8</b>                 | <b>2.6</b>              |

Table 17 details the ALR parcels that are currently "Not used for farming" but that are available and may have potential to be brought into production.

In total, 21% of the available parcels are in Spallumcheen, 17% are in Area F, and 14% are in Area D.

## 6.4 ON PARCELS UNAVAILABLE FOR FARMING

Parcels that are unavailable for farming have an existing land use that excludes agricultural development (e.g. golf courses, schools, small lot residential), or lack sufficient land cover that is available and has potential for farming. A parcel covered in trees with steep topography is considered unavailable for farming because it does not have any available land cover. Parcels that do not meet the minimum parcel availability criteria (>50% of the parcel area and >0.4 ha in available land cover) are considered unavailable for farming. These parcels are a subset of the “Not used for farming” parcels described in Section 5.

Figure 42. Parcel size distribution of unavailable for farming parcels in the ALR

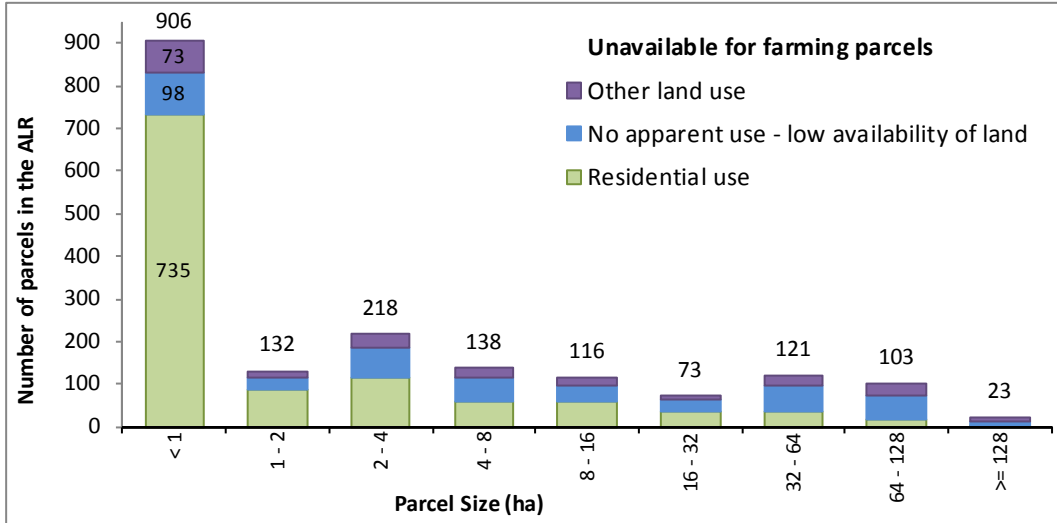


Figure 42 shows the number of ALR parcels that are unavailable for farming. These parcels have an existing land use or low availability of suitable land that makes them unavailable. The majority of the unavailable parcels are less than 1 ha in size (68%).

Figure 43. Land uses on unavailable parcels in the ALR

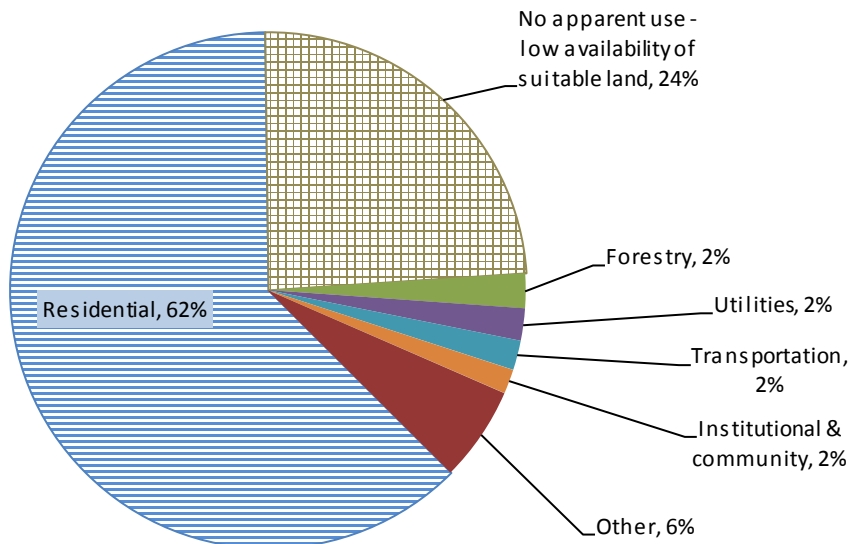


Figure 43 shows the proportion of unavailable for farming ALR parcels by their land use.

Most unavailable for farming parcels have a residential land use (62%).

Parcels with low availability of suitable land have insufficient available land cover. The natural and semi-natural land on these parcels may have physical limitations such as topography or soils.

## Appendix A – Glossary

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

**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.

**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.

**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 family dwellings, 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, 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.

**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.

**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.

**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.

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

**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.

**Effective ALR** – The **Agricultural Land Reserve** area that is in legally surveyed parcels and under the jurisdiction of the area of interest. The effective ALR is the total ALR excluding ALR on Indian reserves and ALR outside of legally surveyed parcels. Effective ALR can be used to compare land cover categories across different jurisdictions.

**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 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.

**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.

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

**Grazed** – Land in **natural pasture or rangeland** that is used for grazing domestic livestock. These areas are considered separate from **Farmed** land cover.

**Homesite (livestock)** – The homesite is the primary location of a farm unit or livestock operation where most livestock management occurs. It is the location of the main ranch or main barn of a **farm unit**.

**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.

**Intensive livestock** – Intensive livestock have specialized structures such as barns, feedlots, or stockyards designed for confined feeding at high stocking densities.

**Land use – Dumps & deposits** – Parcels with landfills, green waste, or outdoor composting facilities. Also includes parcels with significant fill deposits.

**Land use – First Nations** – Parcels designated for ceremonial use, food & material harvesting, or cultural landforms. These parcels are outside of federally designated Indian reserves.

**Land use – Institutional & community** – Parcels with churches, cemeteries, hospitals, medical centers, education facilities, correctional facilities, or government and First Nation administration.

**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.

**Land use – Protected area / park / reserve** – Includes provincial parks, other parks, and ecological reserves. Areas may have passive recreation such as hiking, nature viewing, or camping.

**Land use – Recreation & leisure** – Parcels with intensive recreation (such as zoos, rinks, courts, walking/biking trails), or extensive recreation (such as horseback riding, wilderness camping sites, fishing, hunting, skiing, etc.). Golf course are reported separately.

**Land use – Water management** – Areas used to actively or inactively manage water. Includes reservoirs, managed wetlands, dykes and land which provides natural flood/erosion protection (land outside dyke).

**Land use – Wildlife management** – Areas used to actively or inactively manage wildlife. Includes wildlife reserves, breeding areas, fishing areas, and fish ladders/hatcheries.

**Limited potential for farming** – See **potential for farming**.

**Livestock operation scale** – See **Scale of livestock operations**.

**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 – Grass** – 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 grass.

**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 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 – Shrubs** – 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 vegetation used for grazing domestic livestock. This land cover is considered “Used for grazing” and “Not used for farming” although these areas are usually extensions of more intensive farming areas.

**Non homesite (livestock)** – A location where livestock are present, but related infrastructure is minimal. Non homesites are used for pasturing and are secondary to the farm units primary (homesite) location.

**Non intensive livestock** – Non intensive livestock have the ability to graze on pasture and often utilize non intensive barns and corrals/paddocks.

**Not used for farming** – Parcels that do not meet the “Used 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.

**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)

**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. Areas less than 1 acre in size are considered to have limited potential for farming.

**Unavailable for farming** – “Not used for farming” parcels where future agricultural development is improbable because of a conflicting land use or land cover that utilizes the majority of the parcel area. For example, most residential parcels are considered unavailable 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.

**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.

**Used for farming** – See final page of glossary.

**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.

**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 45% 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)

## Appendix B – Maps

- Map 1. Livestock – beef
- Map 2. Livestock – equine
- Map 3. Livestock – poultry & dairy
- Map 4. ALR – large parcels ( > 4 ha )
- Map 5. ALR – small parcels ( < 4 ha )
- Map 6. Farming status – parcel availability for farming

Maps are 11 x 17 inches