

Growing Knowledge



Ministry of
Agriculture

Agricultural Land Use Inventory

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Smithers, Telkwa, Electoral Area A Regional District of Bulkley-Nechako Summer 2013



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http://www.tourismsmithers.com/photos/index.php?album=agriculture_farm

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Table of Contents

Acknowledgments.....	i
Citation.....	i
Contact Information.....	i
Table of Contents.....	ii
List of Tables	iii
List of Figures	iv
List of Maps – Appendix A	v
Acronyms	v
Definitions.....	v
Executive Summary.....	1
Agrologist Comments.....	3
Introduction	7
General Community Information	7
Agricultural Land Reserve.....	8
Inventory Area.....	9
Methodology.....	10
Inventory Methodology.....	10
Description of the Data	11
Presentation of the Data	12
Determination of Parcels within the ALR	13
1. Land Cover and Farmed Area.....	14
2. Land Use and Farm Use	16
3. Availability of Land for Farming.....	19
Characteristics of Available Lands.....	22
4. Farming Activities.....	25
Cultivated Field Crops.....	25
Natural Pasture & Rangeland	33
Greenhouses & Crop Barns	35
Irrigation.....	36
Livestock.....	37
On-Farm Value-Added.....	43
5. Condition of ALR Lands	44
Parcel Inclusion in the ALR	44
Parcel Size & Farming in the ALR.....	45
Appendix A - Maps.....	48

List of Tables

Table 1.	Land cover and farmed area	15
Table 2.	Land use and farming use by parcel	17
Table 3.	Parcel use and land cover in the ALR	18
Table 4.	Status of the land base with respect to farming.....	20
Table 5.	Land use and cover on parcels “Used for farming” with land available for cultivation	22
Table 6.	Land use and cover on ALR parcels “Not used for farming” with land available for cultivation.....	23
Table 7.	Main field crop types by area	25
Table 8.	Small scale agriculture by activity	27
Table 9.	Forage & pasture crops by area	29
Table 10.	Cereals, pulses, oilseeds by area.....	31
Table 11.	Individual crop types by area	32
Table 12.	Natural pasture vegetation types by area	33
Table 13.	Greenhouses by area	35
Table 14.	Main crop types and irrigation.....	36
Table 15.	Livestock activities	38
Table 16.	Beef activities.....	38
Table 17.	Dairy activities.....	39
Table 18.	Sheep/lamb/goat activities.....	39
Table 19.	Value-added activities by scale and type.....	43
Table 20.	Number of farmed and not farmed parcels in the ALR	46

List of Figures

Figure 1.	General location map.....	7
Figure 2.	Agricultural Land Reserve location map.....	8
Figure 3.	Inventory area and Agricultural Land Reserve location map.....	9
Figure 4.	Parcel inclusion in the ALR.....	13
Figure 5.	Land cover and farmed area in the ALR.....	15
Figure 6.	Availability and potential of ALR lands for cultivation.....	21
Figure 7.	Land cover available for cultivation on ALR parcels “Used for farming”.....	22
Figure 8.	Land cover available for cultivation on ALR parcels “Not used for farming”.....	23
Figure 9.	Size of areas available for cultivation on ALR parcels “Not used for farming”.....	24
Figure 10.	Parcel size distribution for ALR parcels “Not used for farming” with land available for cultivation.....	24
Figure 11.	Main field crop types by percentage of cultivated land.....	26
Figure 12.	All field crops by size.....	26
Figure 13.	Forage & pasture and cereals, pulses, oilseeds field size.....	26
Figure 14.	Forage & pasture fields by size.....	29
Figure 15.	Forage & pasture fields by size and type.....	30
Figure 16.	Cereal, pulses, oilseed fields by size.....	31
Figure 17.	Natural pasture areas by size.....	34
Figure 18.	Distribution of greenhouses by crop type.....	35
Figure 19.	Livestock activities (excluding equine) by scale and type.....	39
Figure 20.	Livestock and equine activities by scale.....	40
Figure 21.	Livestock activities (excluding equine) by parcel size and scale.....	40
Figure 22.	Beef activities (excluding equines) by parcel size and scale.....	40
Figure 23.	Livestock activities (excluding equines) by parcel size and type.....	41
Figure 24.	Livestock and equine activities by parcel size.....	41
Figure 25.	Average area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale).....	41
Figure 26.	Total area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale).....	42
Figure 27.	Percent of parcel area utilized for forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale).....	42
Figure 28.	Land cover on parcels with livestock activities (excluding very small scale).....	42
Figure 29.	Parcel inclusion in the ALR.....	44
Figure 30.	Number of parcels in the ALR by parcel size.....	45
Figure 31.	Total area in the ALR by parcel size.....	45
Figure 32.	Number of farmed and not farmed parcels in the ALR by parcel size.....	46
Figure 33.	Number of farmed and not farmed parcels in the ALR by parcel size (line chart).....	46
Figure 34.	Proportion of parcels farmed and not farmed by parcel size in the ALR.....	47
Figure 35.	Proportion of land cover by parcel size in the ALR.....	47

List of Maps – Appendix A

- Map 1. Land cover & farmed area
- Map 2. Land use & farm use
- Map 3. Availability of land for farming
- Map 4. Farming activities
- Map 5. Condition of ALR lands

Acronyms

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

Definitions

General

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

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

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

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

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

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

Land Cover

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

Anthropogenic – Built up - Other – Lands covered by various unused or unmaintained built objects (structures) and their 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, and 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 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 with both are assigned to the closest residence (such as shared driveways, parking or yard).

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Livestock

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

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

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

Unknown livestock – Activities where non-specialized livestock related structures were present but the livestock were not visible and therefore the specific type of livestock could not be determined.

Homesite – The location of the main ranch or main barn of a livestock operation or farm unit¹. Often, other types of farm infrastructure, such as corrals, paddocks, barns and feeding/watering facilities, as well as the farm residence are also at this location. This is the primary location of the farm unit where most livestock management occurs.

Non Homesite – A location where livestock are present but related infrastructure is minimal. Often pasture fencing and watering are the only apparent infrastructure improvements. This location is often used only for pasturing livestock and is secondary to an operation's primary (or homesite) location.

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

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

Land Cover and Farming

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

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

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

¹ Farm unit includes all the property belonging to a farm and may incorporate more than one parcel.

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

Land Use

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

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

Land Use and Farming

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

- medium or large scale livestock, apiculture or aquaculture operations,
- at least 40% parcel area in cultivated field crops (excluding unused forage or pasture),
- at least 40% parcel area built up with farm infrastructure,
- at least 50% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure,
- at least 25% parcel area built up with crop cover structures (excluding unmaintained structures),
- at least 25% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and at least one small scale livestock, apiculture or aquaculture operations,
- at least 30% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and any livestock, apiculture or aquaculture operations,
- at least 23% parcel area in cultivated field crops (excluding unused forage or pasture) and at least 45% 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 30% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure,
- at least 15% parcel area and at least 15 ha in cultivated field crops (excluding unused forage or pasture),
- at least 20% parcel area and at least 10 ha in cultivated field crops (excluding unused forage or pasture),
- at least 25% 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),
- at least 50% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure or natural pasture and any livestock, apiculture or aquaculture operations,
- at least 25% parcel area or 5 ha in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and farm classification,
- at least 10% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and at least 40% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure or natural pasture and farm classification,
- at least 50% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure or natural pasture and farm classification,
- at least 20% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure or natural pasture and at least one small scale livestock, apiculture or aquaculture operations and farm classification,
- at least 10% parcel area in cultivated field crops (excluding unused forage or pasture) or farm infrastructure and medium or large farm storage structure.

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

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

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

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

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

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Executive Summary

The Regional District of Bulkley-Nechako (RDBN) is located in north-central BC. The RDBN covers 77,000 sq. kilometers and has a population of 39,208 (2011 census). The Planning Department is responsible for the planning and regulation of land use and development within the RDBN and recently completed a Regional Agricultural Plan (2012)². The Agricultural Plan recommended the completion of an Agricultural Land Use Inventory (ALUI) for select agricultural areas experiencing development pressures.

In the summer of 2013, the BC Ministry of Agriculture (AGRI) and the RDBN conducted an ALUI in the Town of Smithers, Village of Telkwa, and a portion of Electoral Area A. The ALUI was funded in part by the Investment Agriculture Foundation of BC and the Omineca Beetle Action Coalition.

ALUIs help to understand the type and extent of agricultural activities in the inventory area and provide a baseline which can be used to measure land use change over time. The data can be used to determine the capacity for agricultural expansion, as well as to quantify the amount of land within the Agricultural Land Reserve (ALR) that is unavailable for agriculture. The data allows the estimation of agricultural water demand with the use of an irrigation water demand model.

Included in the inventory were private legal land parcels greater than 1 acre, and i) completely or partially within the Agricultural Land Reserve, or ii) zoned by local government bylaws to allow agriculture and aerial photos showed signs of agriculture. Also included were parcels classified by BC Assessment as having “Farm” status for property tax assessment, parcels with active crown leases where the purpose is for agriculture, or Indian reserves where aerial photos showed signs of agriculture. Other Crown owned parcels and un-surveyed Crown land was excluded from the inventory.

In total, 29,217 ha on 1,141 private parcels and one agriculture lease were inventoried in 2013 and thus form the basis of this report. This includes 28,285 ha of land on 1,111 parcels inside the ALR and 933 ha of land on 31 parcels outside the ALR.

A further 18,825 ha of land met the criteria above, but was not inventoried due to time constraints and distance from the Town of Smithers and Village of Telkwa. Due to their more rural location and proximity to crown range, these more distant areas have significant agriculture opportunities and should be inventoried in the future to give a more complete picture of agriculture in Electoral Area A.

The ALUI was conducted using visual interpretation of aerial imagery combined with a drive-by “windshield” survey method 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 by how people utilize the land. These two types of data allow for different forms of analysis.

By land cover, a total of 10,617 ha or 38% of the inventoried ALR is actively farmed. An additional 163 ha of land outside the ALR is farmed. A total of 12,390 ha or 44% of the inventoried ALR has limited potential for cultivation due to topographical, physical or operational constraints and 4,219 ha or 15% of the inventoried ALR is available and has potential for cultivation but is not currently farmed. See Table 1, Table 4 and Map 1 for details.

² <http://www.rdbn.bc.ca/planning-department/land-use-planning/planning-studies/agricultural-plan>

For land use, the entire parcel was examined, and a “Used for farming” definition was applied based on the percentage and/or scale of the parcel in cultivated crops, farm infrastructure, and/or certain scales of livestock production. By land area, a total of 20,449 ha or 72% of the inventoried ALR was on parcels “Used for farming”. By parcel count, 445 parcels or 40% of the ALR parcels inventoried are “Used for farming”. See Table 2 and Map 2 for more details.

There are 11,062 ha of cultivated land in the inventory area with 10,899 ha in the ALR and 163 ha outside the ALR. The most common crop was forage and pasture with 10,529 ha or 95% of cultivated land. There are 440 ha of grain crops including canola, barley, oats, wheat, and field peas. In addition to the cultivated land, there are 3,201 ha of natural pasture and 80 poly greenhouses on 4 greenhouse operations. Two of the 4 are large reforestation seedling operations with 78 greenhouses (some gutter connected) covering over 50,000 sq. m. See Tables 7, 9, 10, 11 and Map 4 for details.

Small scale agriculture is defined as crops and greenhouses where the area utilized is less than 500 square meters. These small operations are seldom full-time but still contribute significantly to local food production and may even have long term potential for larger scale commercial agriculture. In the inventory area, there are 63 greenhouses, 2 fruit gardens, 10 mixed gardens and 69 vegetable gardens for a total of 144 small scale agriculture activities. See Table 8 and Map 2 for more information.

Irrigation use was captured by crop type and irrigation system type, to aid in developing a water demand model for agriculture. Irrigation is very rare with only 124 ha of cultivated field crops under irrigation in the inventory area. See Table 13 and Map 4 for more information.

Livestock activities were also recorded, but are very difficult to measure using a windshield survey method. Livestock may not be visible if they are in barns, on another land parcel, or on Crown range tenures. The inventory data does not identify animal movement between parcels that make up a farm unit, but reports livestock at the parcel where the animals or related structures are observed. No actual livestock numbers were obtainable through the inventory, so the results were reported as a range in terms of animal unit equivalents for each parcel.

Beef and dairy are both important livestock production industries in the Bulkey Nechako. In the inventory area, there are 51 beef operations including 15 large scale (> 100 cattle) operations with 2 intensive feedlots and 17 medium scale (25 – 100 cattle) operations with 1 intensive feedlot. There are 11 dairy operations including 2 large scale (> 100 cattle) intensive operations and 9 medium scale (25 – 100 cattle) intensive operations. Although equines are not important for food production, they contribute greatly to the rural life style. In the inventory area, small equines operations are quite common. Equines accounted for 84 out of 173 livestock operations, however all are “non-intensive” and only 4 have more than 25 animals. See Tables 15, 16, 17 and Map 4 for more information.

A parcel size analysis was conducted on all privately owned ALR parcels in the Town of Smithers, Village of Telkwa, and Electoral Area A including those not inventoried in 2013. Of these parcels, the average parcel size is 27.4 ha, 19% are less than 1 ha, 445 (26%) are “Used for farming”, 6 (<1%) are “Used for grazing”, 660 (38%) are “Not used for farming or grazing”, and 621 (36%) were not inventoried. The majority of parcels larger than 16 ha are “Used of farming” and the majority of parcels less than 16 ha are “Not used for farming”. See Section 5 and Map 5 for more information.

This report provides some of the necessary background to understand the current status of agriculture on the land base which will help make informed decisions on how to best manage the agricultural land base in order to support and strengthen farming in the future.

Agrologist Comments

The Bulkley Valley is predominately ranching, dairy, and forage country. In the 1950s, the Bulkley Valley was famous for Timothy grass seed export by rail. Earliest known agriculture crop records mention the harvest of Red Fife wheat from 1914 in vicinity of the Lake Kathlyn (then known as Chicken Lake).

Today, a diversity of agricultural commodities are produced such as: oats, barley, canola, alfalfa, clover, timothy and orchard grass hay, as well as hardy root-vegetables, tree-fruits, berries, poultry and eggs, swine, sheep, and of course beef production and dairying. A high frequency of equine presence recorded during the inventory demonstrates their important roles ranging from pulling implements to recreational riding to servicing nearby guide & outfitter operations. Dry and wrapped green feed from hay and cereal crops typically produced around mid to late July is stored as critical winter feed for livestock herds. Small greenhouses are becoming increasingly popular and are usually used to extend the growing season, produce typical heat-loving vegetables and fruits, and/or transplant and bedding plant production. Vegetable gardens visible during the time of survey were also recorded in order to gauge a level “back yard agriculture” within the inventory area. These gardens did not count as “used for farming” as per the predetermined survey criteria (see definitions Page v). No doubt many gardens were missed but the relatively high number of gardens (69 vegetable and 10 mixed) recorded demonstrates appreciation for homegrown produce. The many benefits, as well as knowledge and skill required to maintain these gardens are not easily measured but do have a positive contribution to community social fabric.

Part-time farming is common in the inventory area, with off-farm supplemental income from forestry, mining and service industries. Diversified agricultural activities and commodities produced in the area, combined with strong local consumer support and agriculture food-system awareness, positively contribute to the overall resiliency and agriculture potential of the area. Because of increased local food awareness (and demand) as well as distance to large market logistics, many agriculture producers choose to focus on marketing to the local or regional consumer by finding their unique production and market niche(s).

Although many of the soil associations found in the Bulkley Valley are productive and can support diverse agricultural activities as mentioned, climatic realities restrict the agriculture capability of the land. Well-drained, clay loam textured glacial till is the dominant soil parent material on which agriculture occurs and agriculture capabilities vary greatly, from Class 3 to Class 7. Smooth flat lands are rated as Class 3, and lands limited by stoniness and topography have been rated Classes 4 and 5.

The highest Canada Land Inventory soil capability rating in the inventory area is Class 3 which comprises approximately 34% of the inventory area, while Class 4 comprises approximately 50% and Class 5 comprises approximately 8%. These capability ratings demonstrate that the inventory area comprises much of the higher-capability land within the Bulkley Valley. If one looks at the entire inventory area on paper, primarily all of the recorded agricultural activity occurs on valley-bottom and low elevation side-slopes with southern aspect. These locations offer better soils and moderate topography and help to mitigate climatic limitations.

In addition to the numerous private and Crown land parcels of ALR land not currently being farmed, at the time of writing, there is approximately 1600 ha of Crown land in the Bulkley Valley designated as agriculture development areas (ADA land) and intended for agriculture expansion through the FLNRO Crown Lands Extensive Agriculture program.

Forage-livestock production is best suited to the general capability of the land and is demonstrated by the high percentage of cultivated land (95%) in this type of production. Hardy field vegetable crops do exist, but they are mainly located at lower elevations with favourable southern aspect, clay loam soils, and available water. The frost-free season ranges from 20 days in frost susceptible areas to 130 days. Main climatic limitations are frost-pooling and drought.

Land with limited potential for cultivation, particularly in an east/west fashion away from the Bulkley River drainage, may be suitable for non intensive grass forage production or permanent pasture depending on severity of climate and/or soil restrictions. These limited capability sites should not be outright dismissed, as they can play a vital role in providing spring and fall livestock feed similar to Crown (grazing) range tenures which help alleviate feed costs.

Dry hay is typically comprised of Timothy grass, Orchard grass, clover and alfalfa. Green feed as wrapped silage is typically comprised of peas and barley. Although small-scale and not exhaustively recorded in the inventory, there is an increasing amount of experimental crop-types being produced with corresponding interest in specialized equipment such as small harvesting combines and grain driers. This ongoing experimentation is indicative of a general interest in exploring further agriculture potential of the inventory area. Continued research in crop species/varieties, efficient water use and delivery, soil conservation, fertility, and cultivation practices is necessary to mitigate potential impacts to agricultural production from climate change.

When classifying the primary land cover for this inventory, environmental and physical limitations to agriculture were noted for each land cover not currently in agricultural production. By far the most common limitations noted were soils (stoniness) and topography. (See Table 4 on Page 20 which shows 12,390 ha or 44% of the inventoried ALR has limitations). This figure should be treated with caution however as many productive parcels used for agricultural activities today likely started with these same “raw” limitations but were improved with time and effort. Similar parcels and physical limitations should not be discounted automatically as inferior areas as agriculture potential largely depends on the expectations of the producer. For example, harvest of cereal and oilseed crops with the use of a combine commonly require uniform slope with few obstacles (and few limitations as mentioned above), whereas hay fields and pasture are more commonly found on rolling or moderate slope topography.

Additionally, the importance of natural depressions or kettles that naturally capture precipitation should not be considered “non-productive” areas. These naturally occurring water-storage features play a vital role for livestock water, gravity feed irrigation systems, residential use, and even fire-protection. Mechanical irrigation of field crops is not common, although several irrigation delivery systems were visible at the time of survey but appeared unused.

Valuable agriculture-related infrastructure, such as a privately-owned Class B abattoir, seed/feed/fertilizer retail outlets, machinery dealers, rail, highway and the Prince Rupert container-port, all serve to support the agriculture industry. Multiple levels of governments as well as industry associations such as the Smithers Farmers Institute, the BC Cattlemen’s and the Dairymen’s Association also provide vital support. Several non-government associations, such as the Groundbreakers CSA-based food distribution network and the robust Smithers Farmers’ Market, are also contributing factors. It is hoped that building a strong network of producer associations will increase Regional branding recognition and ultimately further increase the level of local food support (demand).

Ensuring a consistent supply-chain of product to markets to meet possible increases in demand for local foods will require more cold-storage, more value-added processing facilities, more innovative farm operators, and robust business plans. With a finite agriculture landbase available in the Bulkley Valley, and much of it already in some form of production (49% of inventoried ALR land farmed or grazed), cost-effective expansion may come in the form of increases in on-farm efficiencies and intensity, particularly if land-purchase values continue to increase.

As a snapshot of agriculture land use, this inventory has established a baseline of information which can be used for comparison against future agriculture land use inventories. Public awareness of the high agricultural value of land is common, particularly within close proximity to Smithers and Telkwa, and many market garden and niche farmers are interested in these smaller lots. With these observations in mind, it will be interesting to track future agriculture use on smaller 2 – 40 acre rural parcels such as the Quick East/West Roads area.

It is well known that working farms need space to operate. Residential land use can hinder agriculture production through increased road traffic, and increased conflict arising from noise, dust, odour and other complaints. Large farm holdings between Smithers and Telkwa could be impacted as a result of expanding residential and other non-agricultural use(s).

It was a pleasure taking part in the Smithers Agriculture Land Use Inventory as part of a team to produce the findings within this report.

John Stevenson, P.Ag

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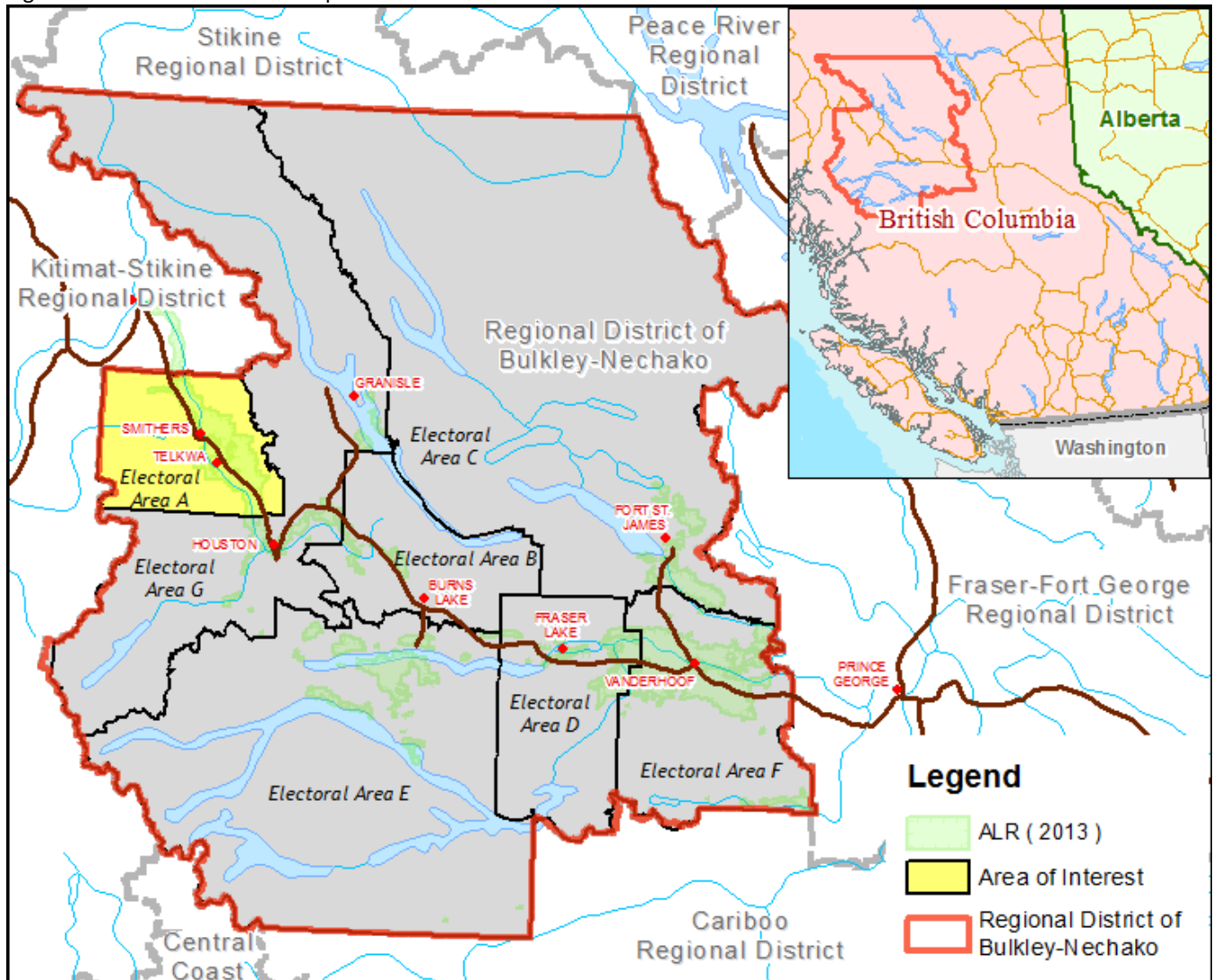
Introduction

GENERAL COMMUNITY INFORMATION

The Town of Smithers (pop. 5,404)³ is located in the Bulkley Valley of northwestern BC, on the Trans Canada Highway (Yellowhead Route 16), approximately half way between Prince Rupert and Prince George. Just south east of the Town of Smithers on Route 16 is the Village of Telkwa (pop. 1,350)¹. Electoral Area A (pop. 5,391)¹ is the surrounding rural area and includes the unincorporated communities of Evelyn and Quick. All are within the Regional District of Bulkley-Nechako (RDBN). The area also contains Moricetown First Nation reserves Oschawwinna 3 and Jean Baptiste 28.

Expansive farm land exists throughout the rolling hills and river valley bottoms of the Bulkley Valley. The area is renowned for its world-class steelhead fishing, multi-seasonal tourism, and rural lifestyle. Agriculture, mineral exploration and mining are important economic drivers, however the forestry sector continues to be the major employer.

Figure 1. General location map



³ Statistics Canada, 2011 Census; <http://www12.statcan.gc.ca/census-recensement/index-eng.cfm>

AGRICULTURAL LAND RESERVE

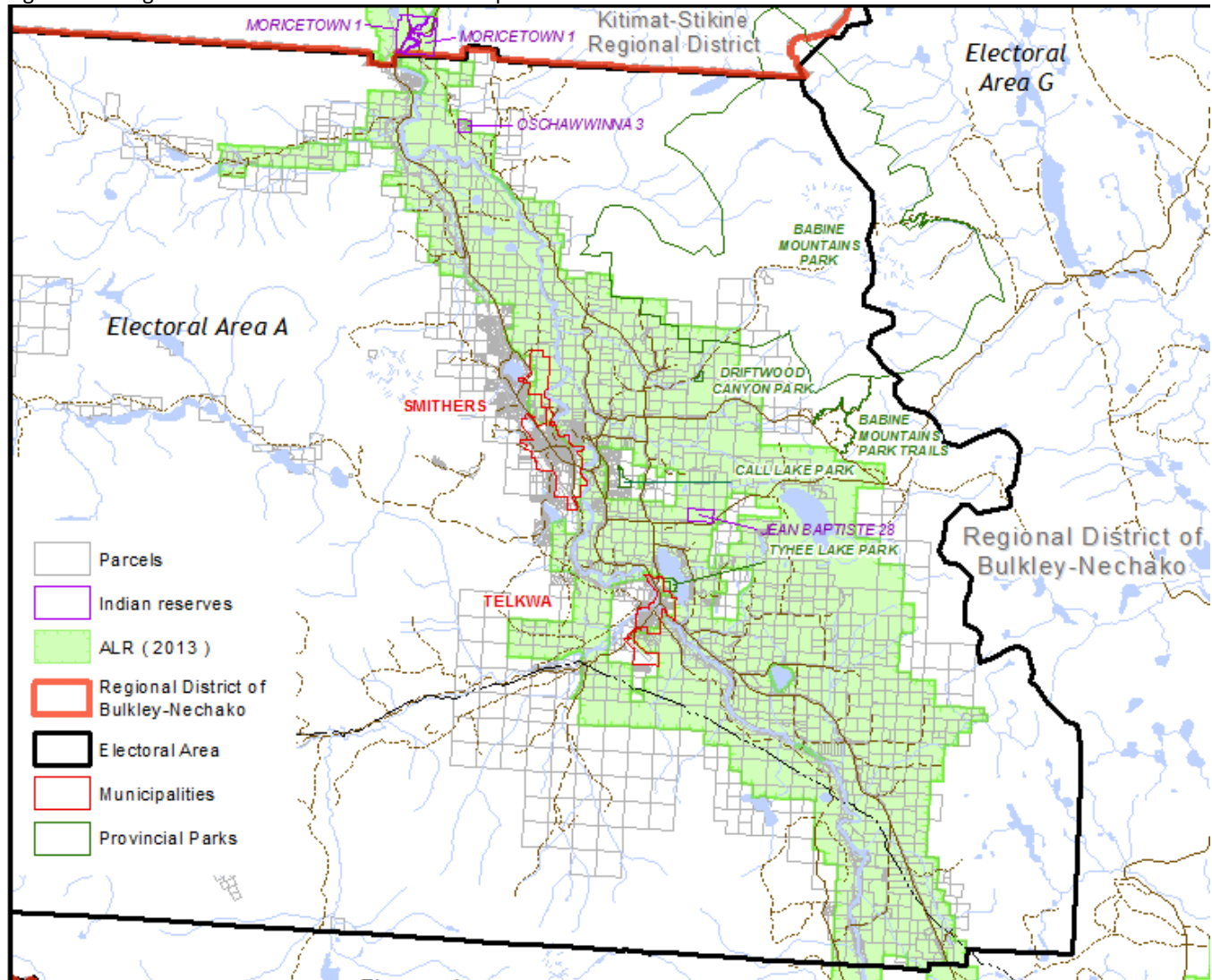
The Agricultural Land Reserve (ALR) is a provincial land use zone that was designated in 1973 where agriculture is recognized as the priority use. Within the ALR, farming is encouraged and non-agricultural uses are controlled.

In the RDBN, there is 373,405 ha⁴ of ALR land (shown in Figure 1); 71,792 ha⁵ or 19% is within the area of interest (Town of Smithers, Village of Telkwa, and Electoral Area A).

The total size of the area of interest is 374,876 ha⁶. With 71,792 ha³ of ALR, 19% of the area of interest is in the ALR. This includes 64,917 ha³ in legal land parcels and 6,875 ha³ outside legal land parcels in Crown land, rights-of-way, or water. The ALR in legal land parcels includes

- 382 ha³ or 27% of the legal land parcels in the Town of Smithers;
- 50 ha³ or 8% of the legal land parcels in the Village of Telkwa; and
- 64,485 ha³ or 58% of the legal land parcels in Electoral Area A.

Figure 2. Agricultural Land Reserve location map



⁴ Provincial Agricultural Land Commission (ALC) Annual Report 2012/13 Pg 31. http://www.alc.gov.bc.ca/publications/2012-13%20ALC_Annual%20Report_Final.pdf.

⁵ Agricultural Land Commission, ALR mapping, Land and Resource Data Warehouse, 2012-10-31 (area calculated in GIS).

⁶ Calculated in GIS.

INVENTORY AREA

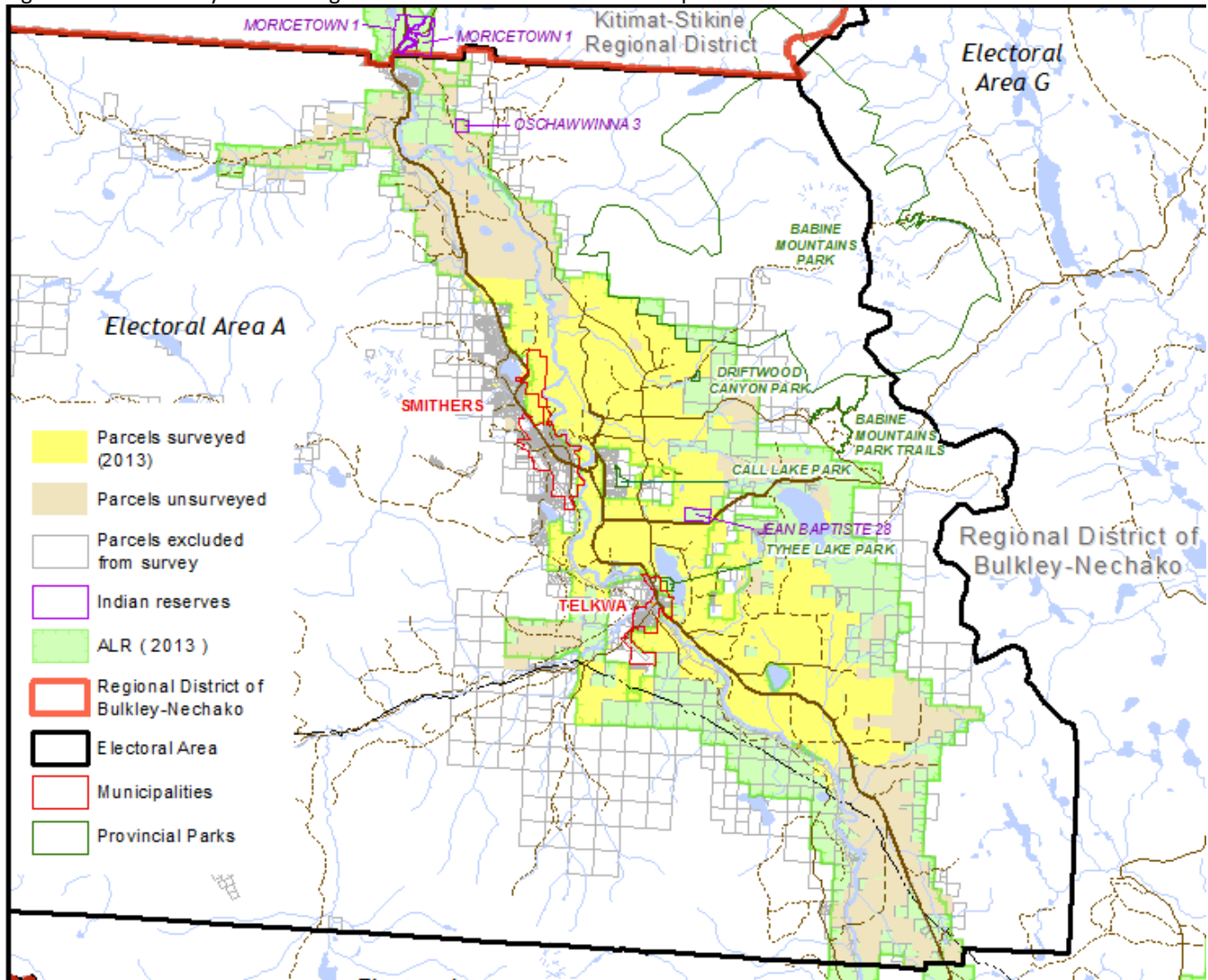
Only land where there is a probability of agriculture is considered for inventory. This includes land on

- legal land parcels privately owned greater than 1 acre⁷; and
 - completely or partially within the ALR; or
 - classified by BC Assessment as having “Farm” status for property tax assessment; or
 - zoned by local government bylaws to allow agriculture and aerial photos showed signs of agriculture.
- active crown leases where the purpose is for agriculture; and
- Indian reserves where aerial photos showed signs of agriculture.

A total of 1,571 parcels, 5 agriculture leases, and the Oschawwinna 3 Indian Reserve (49,128 ha total area, 47,110 ha ALR area) meet the above criteria. Excluded are ALR land on Crown parcels (17,807 ha) or ALR land outside legal land parcels (6,875 ha).

In 2013, 1,141 parcels and one agriculture lease (29,217 ha total area, 28,285 ha ALR area) were field inventoried. This includes 19 parcels in the Town of Smithers (10 owned by the municipality of Smithers) and 5 parcels in the Village of Telkwa. This field data provides the basis for this report.

Figure 3. Inventory area and Agricultural Land Reserve location map



⁷ One acre is approximately 0.404 ha.

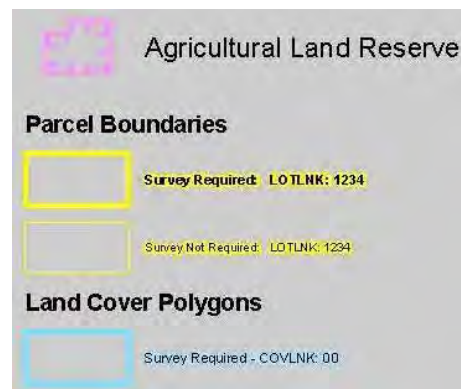
Methodology

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 Smithers land use inventory was conducted in the summer of 2013 by a BC Ministry of Agriculture Agrologist and a RDBN Planning Technician. The survey crew visited each property and observed land use, land cover, and agriculture activity from the road. Where visibility was limited, data was interpreted from aerial photography in combination with local knowledge. The technician entered the survey data into a database on a laptop computer.



Field survey maps provided the basis for the survey and included

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



⁸ Cadastre mapping (2013) was provided the Integrated Cadastral Information Society.

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 that add value to raw agricultural products.

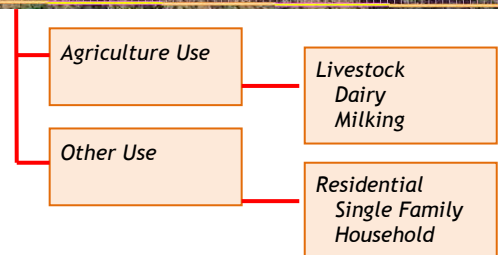
Once acquired through the survey, the data was brought into a Geographic Information System (GIS) to facilitate analysis and mapping. Digital data, in the form of a tabular database and GIS spatial layers (for maps) may be available with certain restrictions through a terms of use agreement.

General land use:

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

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

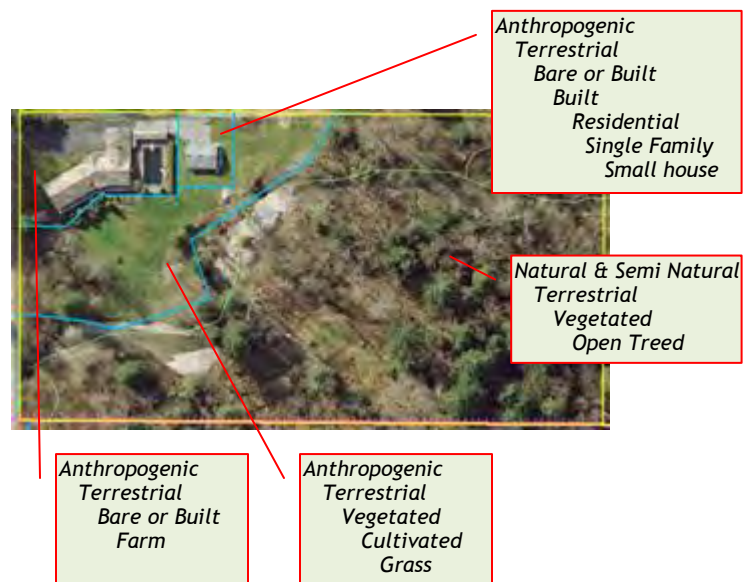
In addition, the availability of non-farm use properties for future farming was assessed based on the amount of potential land for farming on the property and the compatibility of existing uses with future farming activities.



Land cover:

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

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



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

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

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

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

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

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

PRESENTATION OF THE DATA

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

DETERMINATION OF PARCELS WITHIN THE ALR

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

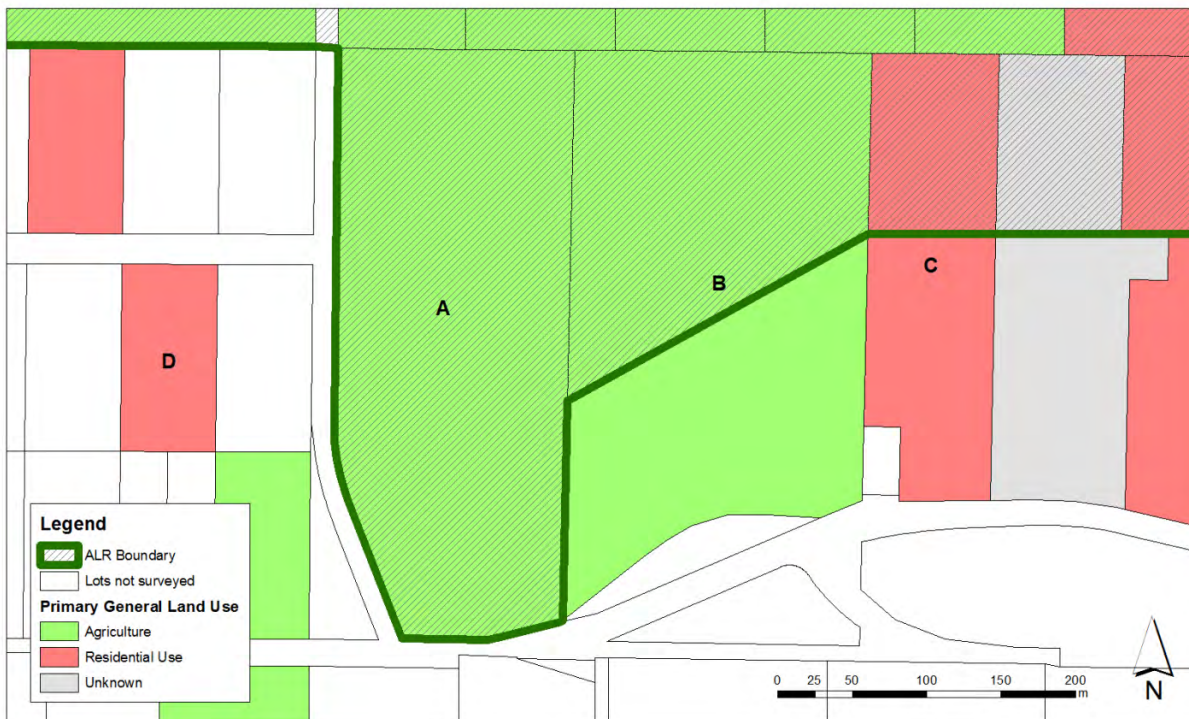
Figure 4 illustrates the frequent misalignment between parcel boundaries and the ALR boundary. Given that the dark green line represents the ALR boundary, Lot A is completely in the ALR and Lots B and C have only a portion of their area in the ALR. Lot D is completely outside the ALR.

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

To achieve an accurate picture of the ALR land in the area of interest, parcels that meet the following criteria are considered ALR parcels:

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

Figure 4. Parcel inclusion in the ALR



1. Land Cover and Farmed Area

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

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

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

Four land cover types are considered “Farmed”

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

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

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

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

Table 1. Land cover and farmed area

Land cover*		ALR		Outside ALR (ha)	Total inventoried area (ha)
		In ALR (ha)	% of inventoried ALR area		
Actively farmed	Cultivated field crops	10,490	37%	157	10,647
	Farm infrastructure	113	< 1%	5	118
	Greenhouses	14	< 1%	<1	14
Inactively farmed	Unmaintained field crops	53	< 1%	2	55
	Unused forage or pasture	356	1%	4	360
FARMED SUBTOTAL		11,026	39%	169	11,195
Anthropogenic (not farmed)	Managed vegetation	516	2%	20	537
	Non Built or Bare	86	< 1%	<1	87
	Residential footprint	74	< 1%	1	75
	Settlement	28	< 1%	<1	28
	Transportation	222	< 1%	34	255
	Utilities	12	< 1%	4	17
	Built up - Other	<1	< 1%	-	<1
	Waterbodies	34	< 1%	<1	34
SUBTOTAL		972	3%	60	1,033
Natural and Semi-natural	Natural pasture or rangeland	2,964	10%	237	3,201
	Vegetated	12,654	45%	442	13,096
	Wetlands	385	1%	20	405
	Natural bare areas	2	< 1%	-	2
	Waterbodies	281	< 1%	4	286
SUBTOTAL		16,286	58%	704	16,990
TOTAL		28,285	100%	933	29,217
Not inventoried	Not inventoried	18,825			
	Excluded Crown parcels	17,807			
	Outside legal parcels	6,875			
SUBTOTAL		43,508			
TOTAL		71,792			

* See "Land Cover" in the Definitions section for terms used in this table.

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

There are 11,195 ha in "Farmed" land cover although 415 ha are "Inactively farmed" in unused forage or pasture or unmaintained field crops.

Land used in support of farming such as farm residences, vegetative buffers or roadways is not included as "Farmed". Land used for natural pasture or rangeland is included as Natural and Semi-natural.

Refer to Map 1 for more information.

Figure 5. Land cover and farmed area in the ALR

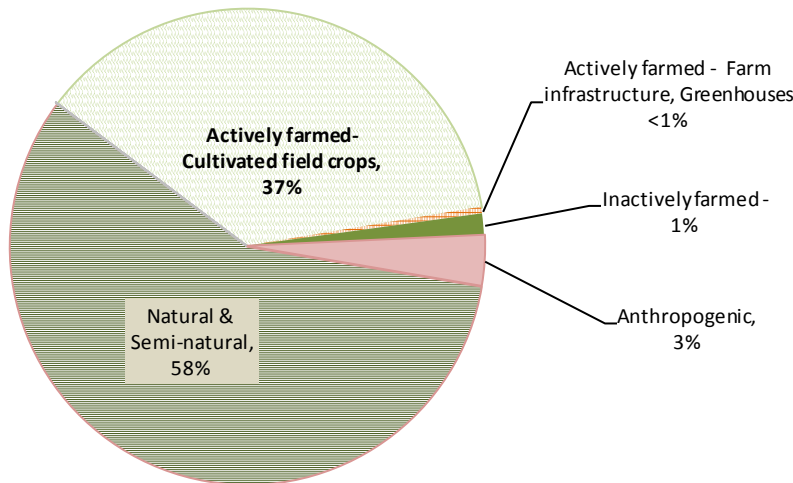


Figure 5 shows the proportions of land cover types across the inventoried ALR.

While 37% is "Actively Farmed – Cultivated field crops", the dominant land cover is Natural & Semi-natural at 58%.

Land used as natural pasture or rangeland is included as Natural and Semi-natural.

2. Land Use and Farm Use

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

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

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

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

Table 2. Land use and farming use by parcel

Parcel land use*	Inventoried ALR				Outside ALR (ha)	Number of non ALR parcels	Total area (ha)	Average parcel size (ha)	
	In ALR (ha)	% of ALR	Number of ALR parcels	% of ALR parcels					
Used only for farming - no other use	7,990	28 %	161	14 %	304	6	8,295	167	
Used for farming - Mixed use	Residential	11,703	41 %	267	24 %	90	5	11,793	272
	Recreation & leisure	266	<1 %	6	<1 %	< 1	-	267	6
	Transportation	251	<1 %	5	<1 %	< 1	-	251	5
	Institutional & community	121	<1 %	2	<1 %	< 1	-	121	2
	Wildlife management	64	<1 %	1	<1 %	-	-	64	1
	Forestry	25	<1 %	1	<1 %	8	-	32	1
	Industrial	24	<1 %	1	<1 %	< 1	-	24	1
	Commercial & service	4	<1 %	1	<1 %	< 1	-	4	1
USED FOR FARMING SUBTOTAL	20,449	72 %	445	40 %	401	11	20,850		
Used only for grazing - no other use	277	<1 %	5	<1 %	49	1	326	6	
Used for grazing Residential	36	<1 %	1	<1 %	20	-	56	1	
USED FOR GRAZING SUBTOTAL	313	1 %	6	<1 %	69	1	382		
Not used for farming or grazing	Residential	4,087	14 %	475	43 %	218	11	4,305	486
	No apparent use	2,563	9 %	122	11 %	186	6	2,748	128
	Transportation - airport	274	<1 %	6	<1 %	51	1	325	7
	Utilities	239	<1 %	5	<1 %	< 1	-	239	5
	Transportation	188	<1 %	34	3 %	4	-	193	34
	Recreation & leisure	66	<1 %	6	<1 %	4	1	70	7
	Commercial & service	65	<1 %	2	<1 %	< 1	-	65	2
	Recreation & leisure - golf	18	<1 %	1	<1 %	-	-	18	1
	Industrial	9	<1 %	3	<1 %	< 1	-	9	3
	Institutional & community	8	<1 %	5	<1 %	< 1	-	8	5
Protected area / park / reserve	6	<1 %	1	<1 %	< 1	-	6	1	
NOT USED FOR FARMING SUBTOTAL	7,523	27 %	660	59 %	463	19	7,985		
TOTAL	28,285	100 %	1,111	100 %	933	31	29,217		
Not inventoried	Not inventoried	18,825							
	Excluded Crown parcels	17,807							
	Outside legal parcels	6,875							
SUBTOTAL	43,508								
TOTAL	71,792								

* See "Land Use" in Definitions section for terms in this table.

Table 2 shows that 20,449 ha or 72% of the inventoried ALR is on 445 parcels "Used for farming". In addition, there were 11 parcels outside the ALR that were "Used for farming".

Many "Used for Farming" parcels are also used for other purposes with only 161 parcels or 14% of the inventoried ALR parcels exclusively "Used for farming".

The most common mixed use is "Used for farming" and "Residential" with 267 parcels.

Two of the "Used for farming" and "Recreation & leisure" parcels are associated with Logpile Lodge and Northern Twilight horse stables.

The one "Used for farming" and "Wildlife management" parcel is Northern Lights Wildlife Shelter.

The one "Used for farming" and "Industrial" parcel is associated with Driftwood Creek Log Homes.

Refer to Map 2 for more information.

Table 3. Parcel use and land cover in the ALR

Parcel Land Use Used for farming		Land Cover Category						Total In ALR (ha)
		Farmed		Anthropogenic (not farmed)		Natural & Semi - natural		
		In ALR (ha)	% of inventoried ALR area	In ALR (ha)	% of inventoried ALR area	In ALR (ha)	% of inventoried ALR area	
Used only for farming - no other use		3,618	13 %	14	<1 %	4,358	15 %	7,990
Used for farming - mixed use	Residential	6,493	23 %	209	<1 %	5,002	18 %	11,703
	Recreation & leisure	131	<1 %	8	<1 %	127	<1 %	266
	Transportation	101	<1 %	8	<1 %	142	<1 %	251
	Institutional & community	63	<1 %	< 1	<1 %	58	<1 %	121
	Wildlife management	36	<1 %	< 1	<1 %	28	<1 %	64
	Forestry	19	<1 %	-	-	6	<1 %	25
	Industrial	6	<1 %	2	<1 %	16	<1 %	24
	Commercial & service	3	<1 %	-	-	< 1	<1 %	4
TOTAL USED FOR FARMING		10,470	37 %	242	<1 %	9,737	34 %	20,449

Table 3 combines land use and land cover on parcels “Used for farming”. For example, parcels with the mixed use “Used for farming” and “Residential” have a total of 6,493 ha in “Farmed” land cover, 209 ha in “Anthropogenic” (not farmed) land cover, and 5,002 ha in “Natural & Semi-natural” land cover (including natural pasture).

Although 20,449 ha or 72% of inventoried ALR is on parcels “Used for farming” (refer to Table 2), only 10,470 ha of this is actually in “Farmed” land cover as many “Used for farming” parcels are also used for other purposes. In fact, the majority of the “Farmed” land cover in the inventoried ALR is on parcels also used for “Residential” purposes.

3. Availability of Land for Farming

Although demand for locally grown agricultural products is already quite strong, it is anticipated to grow with population growth⁹. Demand, along with a number of other factors, such as commodity types and farm management requirements (nutrient management, bio-security), will influence agricultural land needs in the future.

Lands suitable for new agricultural development may not be available and agricultural sectors that require large land bases, such as dairy or beef, may find it difficult to access sufficient land. Future agriculture growth may come from new commodity types and intensifying land use (for example covered structures such as greenhouses and cell or rotational grazing of livestock) rather than finding new land for development.

The analysis of the availability of land for farming examines how much land is available for new development or expansion, has the potential to be cultivated, and the characteristics of this land.

Properties currently “Used for farming” or with some agriculture already present are considered available for farming expansion. Properties currently “Not used for farming” but with an existing land use compatible with agriculture, such as large lot residential, are also considered available for farming. In both cases, it is assumed that any existing non-farm land use will be maintained and not displaced by agriculture expansion.

Properties currently “Not used for farming” and with an established non-farm use that is incompatible with agriculture such as golf courses, schools, small lot residential, or residential estates; are considered unavailable for farming. These properties have little available land and tend to have very high improvement values. It is uneconomical for a farmer to acquire and convert these properties to farmland given the limited farming potential.

In the Town of Smithers, Village of Telkwa, and Electoral Area A, properties in the ALR and “Used for farming” have an average assessed land and improvement value of \$25,901 per ha.

Properties in the ALR that are considered “Unavailable for farming” have an average assessed land and improvement value of \$185,333 per ha.

(Calculated using 2011 BC Assessment)

Land is further assessed for its cultivation potential based on physical and environmental characteristics.

It is assumed that removing built structures and fill piles, filling in water bodies or remediating slopes/soils to create land with cultivation potential would likely not occur. In addition, areas with operational constraints such as a very small size are considered not to have potential for cultivation.

Only areas in natural and semi-natural vegetation, areas in managed vegetation (managed for landscaping, dust or soil control), and non-built or bare areas are considered to have potential for cultivation.

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

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

Land status		ALR		Outside ALR (ha)	Total area (ha)
		In ALR (ha)	% of inventoried ALR area		
Actively farmed	Cultivated field crops	10,490	37 %	157	10,647
	Farm infrastructure	113	<1 %	5	118
	Greenhouses	14	<1 %	< 1	14
ACTIVELY FARMED		10,617	38 %	163	10,780
Anthropogenic areas supporting farming	Transportation	49	<1 %	3	52
	Artificial Waterbodies	28	<1 %	< 1	28
	Residential footprint	21	<1 %	< 1	21
SUPPORTING FARMING		98	<1 %	4	102
Unavailable for farming due to existing land use	Transportation	79	<1 %	4	83
	Recreation & leisure - golf	14	<1 %	-	14
	Protected area / park / reserve	6	<1 %	-	6
	Transportation - airport	5	<1 %	35	40
	Institutional & community	3	<1 %	-	3
	Residential	< 1	<1 %	-	< 1
Unavailable for farming due to existing land cover	Wetlands	382	1 %	20	402
	Waterbodies	284	1 %	5	289
	Transportation	92	<1 %	< 1	92
	Residential footprint	52	<1 %	< 1	53
	Built up - Other	28	<1 %	< 1	28
	Utilities	12	<1 %	4	17
	Natural bare areas	2	<1 %	-	2
UNAVAILABLE FOR FARMING		961	3 %	69	1,030
Site limitations	Topography &/or soils	11,543	41 %	635	12,178
	Riparian	585	2 %	12	597
	Operational	260	<1 %	2	262
	Drainage	2	<1 %	-	2
LIMITED POTENTIAL FOR CULTIVATION		12,390	44 %	649	13,039
Available & with potential for cultivation	Natural & Semi-natural - Vegetation	2,385	8 %	23	2,408
	Natural pasture or rangeland	970	3 %	< 1	970
	Anthropogenic - Managed vegetation	461	2 %	18	479
	Unused forage or pasture	350	1 %	4	354
	Unmaintained field crops	52	<1 %	2	55
	Anthropogenic - Non Built or Bare	1	<1 %	-	1
AVAILABLE & WITH POTENTIAL FOR CULTIVATION		4,219	15 %	47	4,267
TOTAL		28,285	100 %	933	29,217
Not inventoried	Not inventoried	18,825			
	Excluded Crown parcels	17,807			
	Outside legal parcels	6,875			
SUBTOTAL		43,508			
TOTAL		71,792			

Table 4 shows that 10,617 ha or 38% of the inventoried ALR is actively used for farming; <1% is used in support of farming (farm residences, roads, etc); 3% is unavailable for farming; 44% has limited potential for cultivation; and 15% is available and has potential for cultivation.

Although 44% of the inventoried ALR was found to have limited potential for cultivation, many of the lands currently under cultivation likely started with these same “raw” limitations. The land was improved with time and effort, or was cultivated for less intensive uses, such as pasture for livestock grazing. The likelihood of these limited potential areas being cultivated in the future depends largely on commodity prices and the expectations of the farmer.

Refer to Map 2 and 3 for more information.

Figure 6. Availability and potential of ALR lands for cultivation

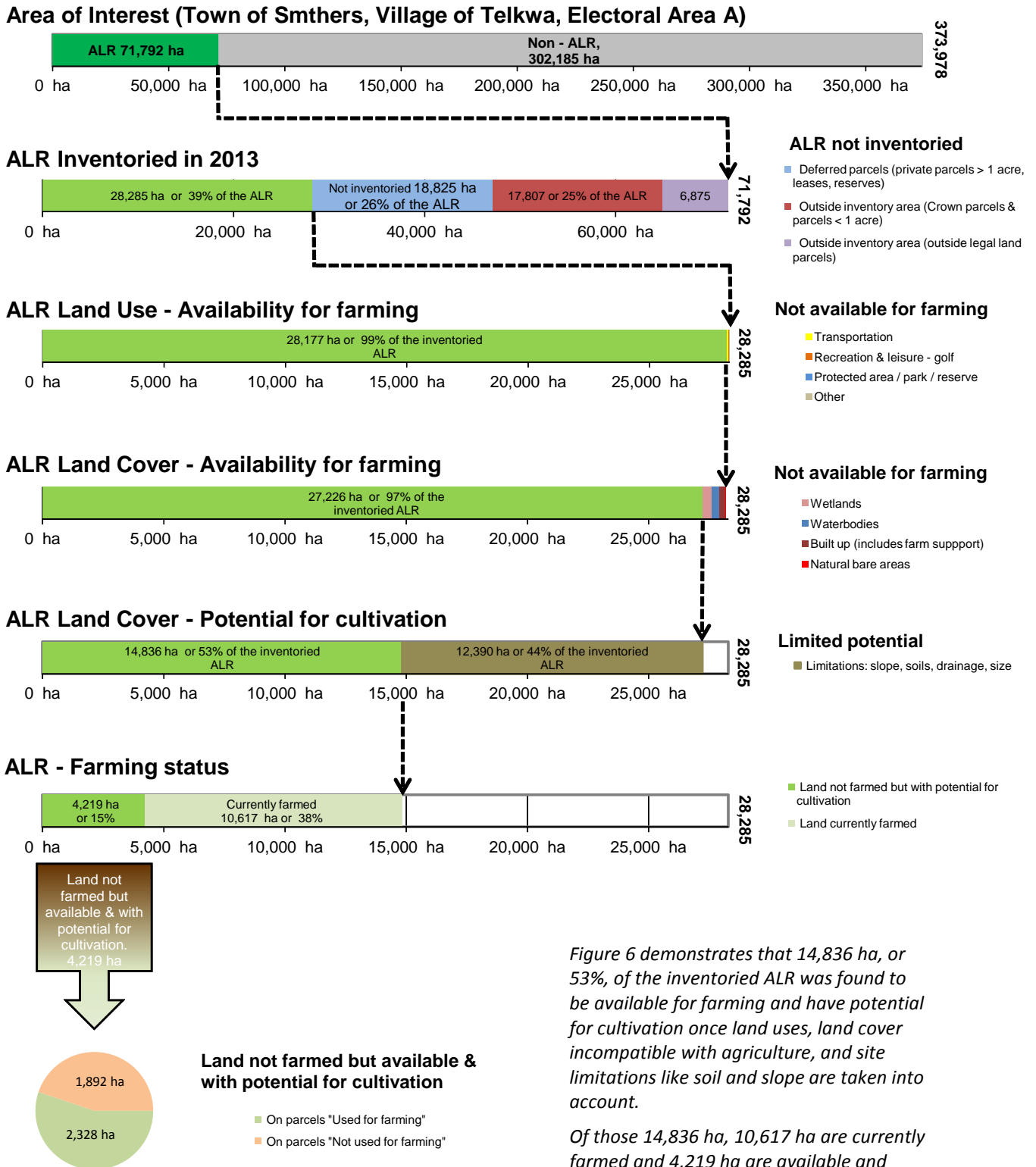


Figure 6 demonstrates that 14,836 ha, or 53%, of the inventoried ALR was found to be available for farming and have potential for cultivation once land uses, land cover incompatible with agriculture, and site limitations like soil and slope are taken into account.

Of those 14,836 ha, 10,617 ha are currently farmed and 4,219 ha are available and have potential for cultivation.

CHARACTERISTICS OF AVAILABLE LANDS

A large factor for future agriculture expansion is the size of the area available. Small areas can effectively be used for some intensive agricultural operations such as mushrooms, floriculture, greenhouses, poultry, and container nurseries. Small areas are also suitable for start-up farmers, horse enthusiasts, farmers testing new technologies, or established farmers wanting to expand through leases.

Despite these opportunities, small areas provide fewer farming choices than large lots. They generally exclude dairy, hogs, poultry barns, and beef back grounding. For example, a dairy cow produces sufficient manure per year to fertilize 0.4 ha of forage production which means a dairy operation consisting of 50 cows would require access to 20 ha of land. Without sufficient land area to utilize the manure as a fertilizer, the dairy operation would have to find other, more expensive, methods to handle the manure produced on the farm. In addition, working farms require sufficient space to operate in order to avoid odour, dust, and noise conflicts with nearby non-farm land uses.

On Parcels Already “Used for Farming”

Table 5. Land use and cover on parcels “Used for farming” with land available for cultivation

Mixed land use on “Used for farming” parcels	Number of parcels	Land not farmed but with potential for cultivation			Land currently farmed			% potential increase to total ALR farmed area
		In ALR (ha)	Outside ALR (ha)	Total area (ha)	In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Residential	182	1,390	6	1,397	4,256	20	4,276	13 %
Agriculture	56	790	3	793	1,245	4	1,249	7 %
Recreation & leisure	5	106	< 1	106	60	< 1	60	<1 %
Transportation	4	40	-	40	83	-	83	<1 %
Institutional & community	1	3	-	3	9	-	9	<1 %
TOTAL	248	2,328	9	2,337	5,654	24	5,677	22 %

Table 5 demonstrates the potential to increase the amount of cultivated land on parcels that are already “Used for farming”. This increase would come from expanding existing farm operations towards a more complete utilization of the available parcel area. It is assumed that existing non-farm land uses would be maintained.

Figure 7. Land cover available for cultivation on ALR parcels “Used for farming”

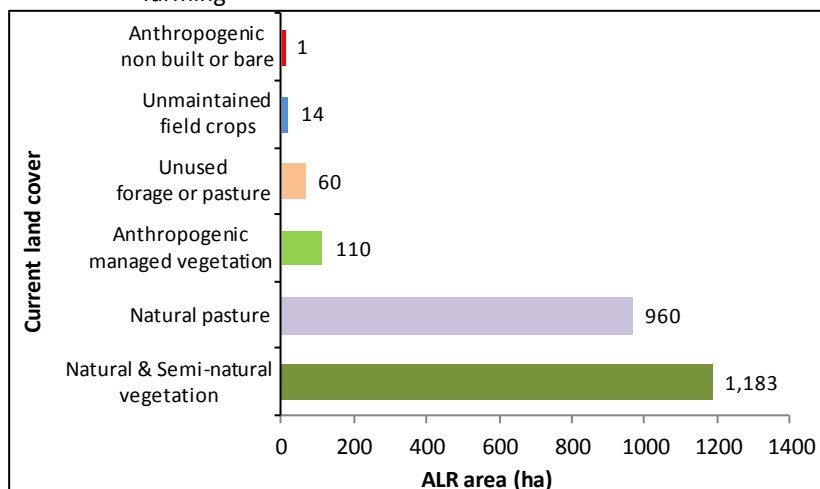


Figure 7 indicates that land in “Natural & Semi-natural vegetation” and “Natural pasture” would offer the greatest gains in cultivation on parcels that are already “Used for farming”.

These gains in farming may not be supported by residents who value privacy and views and would have to be measured against the loss of natural pasture.

In addition, the input costs necessary to achieve these gains may not be recoverable when compared with any expected increase in farm revenue.

On Parcels “Not Used for Farming”

Table 6. Land use and cover on ALR parcels “Not used for farming” with land available for cultivation

Parcel Land use		Number of parcels	Land not farmed but with potential for cultivation			% potential increase to total ALR farmed area
			In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Used for grazing	Used for grazing only	1	4	-	4	<1 %
	Residential	1	12	< 1	12	<1 %
Not used for farming or grazing	Residential	318	1,174	15	1,189	11 %
	No apparent use	45	540	3	544	5 %
	Transportation - airport	6	128	16	144	1 %
	Recreation & leisure	5	17	4	21	<1 %
	Transportation	1	11	-	11	<1 %
	Institutional & community	2	3	-	3	<1 %
	Utilities	1	1	-	1	<1 %
Recreation & leisure - golf	1	< 1	-	< 1	<1 %	
TOTAL		381	1,892	38	1,929	18 %

Table 6 demonstrates the potential to increase the amount of cultivated land on parcels that are “Not used for farming”. This increase would come from prioritizing agriculture over other non-farm land uses and full utilization of the available parcel area for farming. It is assumed that existing non-farm land uses would be maintained.

Figure 8. Land cover available for cultivation on ALR parcels “Not used for farming”

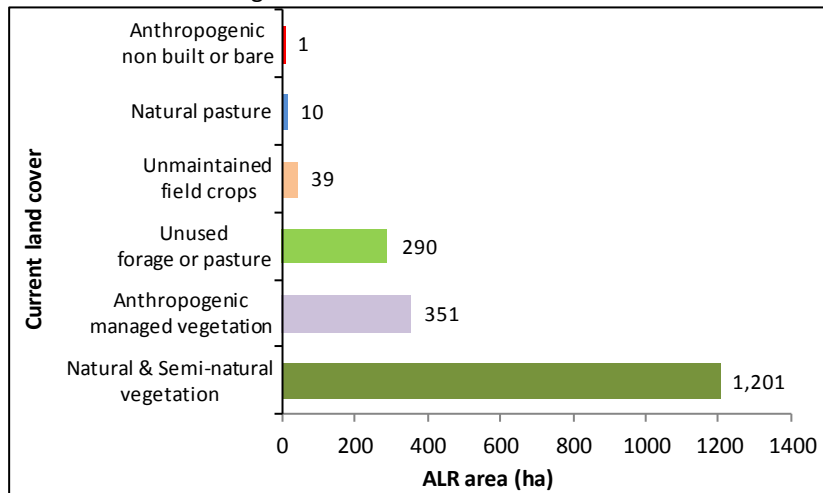


Figure 8 indicates that most of the available land on parcels “Not used for farming” is currently in “Natural & Semi-natural vegetation”.

Converting this land may be at the expense of other values, such as privacy, views, and wildlife habitat, and would have to be measured against the benefits from farming.

Figure 9. Size of areas available for cultivation on ALR parcels “Not used for farming”

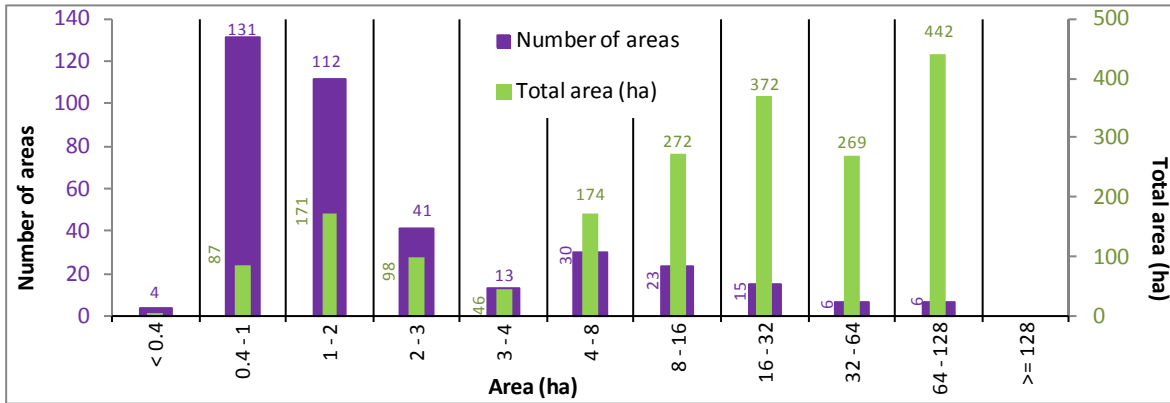


Figure 9 demonstrates that the majority of areas available for cultivation and without limitations are less than 2 ha in size (247 of 381 or 65%). Fewer options are available to efficiently farm small areas. In general, areas should be at least 4 ha or more to provide the widest range of farming options.

There are 80 areas greater than 4 ha and available for cultivation. These areas have a total of 1,528 ha or 79% of the land available (refer to Table 6).

Figure 10. Parcel size distribution for ALR parcels “Not used for farming” with land available for cultivation

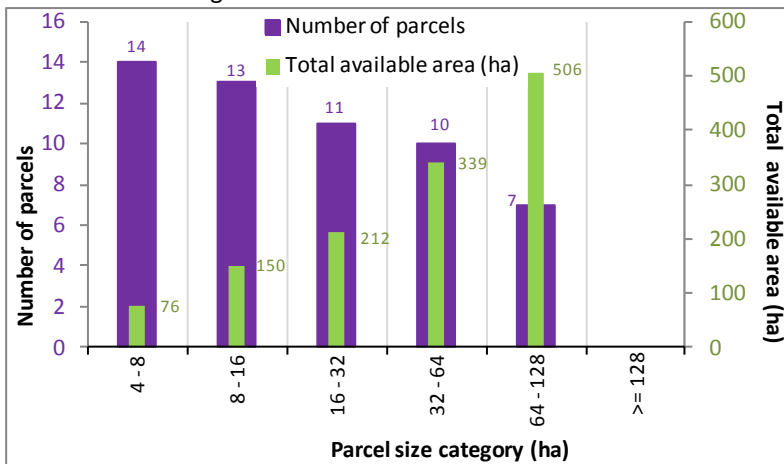


Figure 10 shows parcels currently “Not used for farming” with at least 50% of parcel area and at least 4 ha available for cultivation. In the inventoried ALR, there are only 55 parcels with a total of 1,282 ha available that meet these criteria.

4. Farming Activities

CULTIVATED FIELD CROPS

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

Included with cultivated field crops is fallow farmland, inactively farmed land (i.e. forage or pasture crops which have not been harvested or grazed this season) and land 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 are described by seven crop groupings:

- **Forage & pasture:** grass, legumes
- **Cereals, pulses, oilseeds:** canola, barley, oats, wheat, field peas
- **Cultivated land:** 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 seasons), crop transition
- **Field forestry stock**
- **Field nursery**
- **Strawberries**
- **Floriculture**
- **Mixed vegetables**

Table 7. Main field crop types by area

General Crop Type	ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
	In ALR (ha)	% of inventoried ALR area				
Forage & pasture	10,371	37%	158	10,529	95%	549
Cereals, pulses, oilseeds	435	2%	5	440	4%	19
Cultivated land *	87	< 1%	< 1	87	< 1%	12
Field forestry stock	3	< 1%	-	3	< 1%	43
Field nursery	1	< 1%	-	1	< 1%	-
Strawberries	< 1	< 1%	-	< 1	< 1%	-
Floriculture	-	-	< 1	< 1	< 1%	-
Mixed vegetables	< 1	< 1%	-	< 1	< 1%	-
TOTAL	10,899	39%	163	11,062	100%	623

* Crop field: a continuous or non-continuous area of the same crop type on one parcel. The number of crop fields is equal to the number of parcels where that specific type of crop occurs.

* Cultivated land. 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 7 shows the 8 main field crop types produced on the 10,899 ha of cultivated land in the inventory area. If two or more fields of the same general crop type are on one parcel, they are counted as one crop field. One parcel may have several different types of crop fields.

“Forage & pasture” is the most common type of cultivated field crop accounting for 95% of all cultivated land and 37% of the inventoried ALR.

Refer to Map 4 for more information.

Figure 11. Main field crop types by percentage of cultivated land

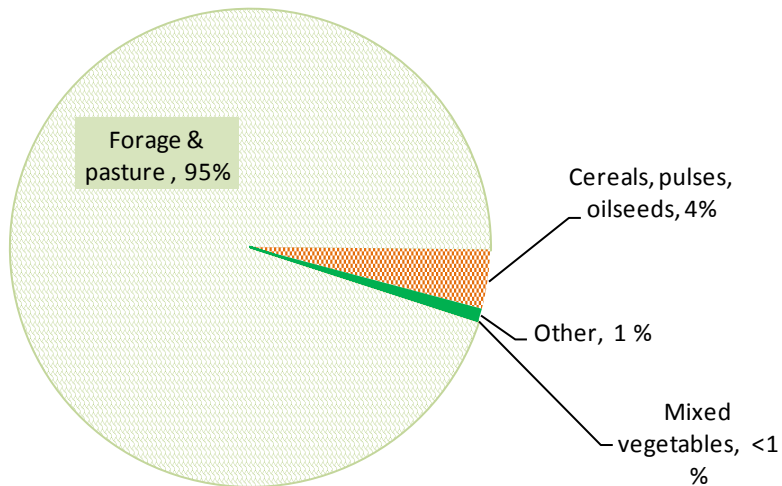


Figure 11 shows the proportion of main field crop types across all cultivated land in the inventory area.

Figure 12. All field crops by size

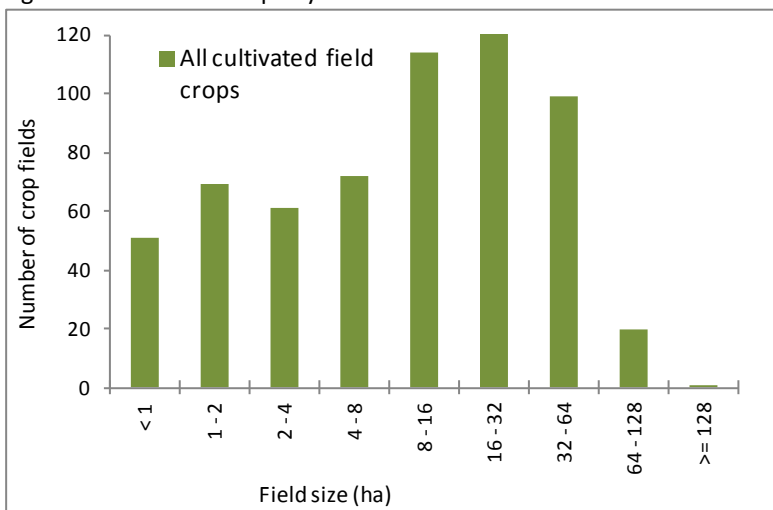


Figure 12 illustrates the number and size distribution of fields used for cultivated field crops.

In the inventory area, cultivated fields are most likely to be 16-32 ha in size.

There are 610 individual crop fields when grouped by main crop types. These fields have an average area of 18 ha and median area of 11 ha.

These fields occur on 571 parcels with an average size of 42 ha and a median size of 35 ha.

Figure 13. Forage & pasture and cereals, pulses, oilseeds field size

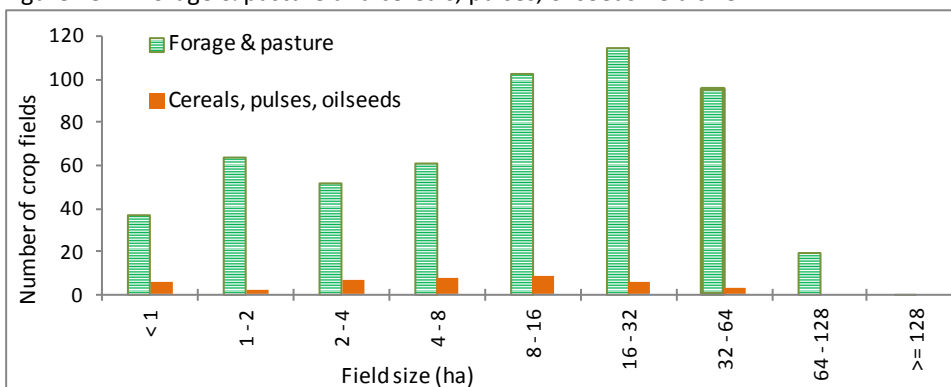


Figure 13 compares the top two main crop types by field sizes.

“Forage & pasture” and “Cereals, pulses, oilseeds” fields occur on a variety of field sizes.

Small scale agriculture

Small scale agriculture plays a significant part in maintaining local food production skills and knowledge, and promotes general awareness of the importance of agriculture. These small operations often provide the nucleus for larger market gardens and greenhouses, and other potential contributions to the local food supply, all which contribute positively to the socio-economic fabric of the community.

Small scale agriculture is defined as crops or greenhouses where the area utilized is less than 500 square meters for the purposes of this report. This includes most residential and subsistence gardens and greenhouses.

Four scales of small scale agriculture are defined:

- **Very small scale:** <100 square meters in size
- **Small scale:** 100 - 250 square meters in size
- **Medium scale:** 250 - 400 square meters in size
- **Large scale:** 400 - 500 square meters in size

Table 8. Small scale agriculture by activity

Type of small scale agriculture (< 500 sq m)		Number of activities	Average parcel size (ha)
Greenhouse	Very small scale	8	40
	Small scale	38	9
	Medium scale	11	7
	Large scale	6	12
Subtotal		63	
Fruit garden	Very small scale	1	134
	Medium scale	1	2
Subtotal		2	
Mixed garden	Very small scale	1	< 1
	Small scale	4	21
	Medium scale	3	4
	Large scale	2	32
Subtotal		10	
Vegetable garden	Very small scale	3	12
	Small scale	26	13
	Medium scale	29	16
	Large scale	11	15
Subtotal		69	
TOTAL		144	

Table 8 details the 144 small agriculture activities identified in the inventory area.

These 144 activities occur on 114 parcels as some parcels have more than one activity.

Refer to Map 2 for more information.

Forage & pasture crops

Forage is a cultivated crop that is cut and made into silage, haylage or hay for livestock feed:

- **Forage (managed):** Management includes weed control & fertilizer/manure applications. Often there is no fencing and crop growth is generally healthy and even.
- **Forage (unmanaged):** Weed management & fertilizer/manure applications are minimal. Crop growth is uneven with weeds.

Pasture is a cultivated crop that is used for grazing only and is not cut:

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

Some areas are used for both forage & pasture:

- **Forage & pasture (managed):** Crop is cut and made into silage, haylage, or hay but is also used for grazing. Fencing is in good condition and crop growth is reasonably even with few weeds. Usually associated with dairy operations.

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

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

Table 9. Forage & pasture crops by area

Forage and pasture crops		ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
		In ALR (ha)	% of inventoried ALR area				
Forage (managed)	Mixed grass / legume	3,190	11%	75	3,265	30%	255
Forage (managed)	Grass	316	1%	-	316	3%	18
Forage (managed)	Legume	16	< 1%	-	16	< 1%	1
Forage (unmanaged)	Grass	3	< 1%	-	3	< 1%	1
Forage (unmanaged)	Mixed grass / legume	115	< 1%	-	115	1%	22
Subtotal		3,641	13%	75	3,716	34%	
Pasture (managed)	Grass	3	< 1%	-	3	< 1%	1
Pasture (managed)	Mixed grass / legume	60	< 1%	-	60	< 1%	7
Pasture (unmanaged)	Grass	52	< 1%	4	56	< 1%	13
Pasture (unmanaged)	Mixed grass / legume	2,191	8%	38	2,228	20%	373
Subtotal		2,305	8%	42	2,347	21%	
Forage & pasture (managed)	Grass	42	< 1%	-	42	< 1%	4
Forage & pasture (managed)	Mixed grass / legume	3,974	14%	35	4,009	36%	322
Subtotal		4,016	14%	35	4,051	37%	
Unused	Grass	24	< 1%	< 1	24	< 1%	11
Unused	Mixed grass / legume	333	1%	4	336	3%	76
Unmaintained / abandoned	Grass	4	< 1%	-	4	< 1%	5
Unmaintained / abandoned	Mixed grass / legume	49	< 1%	2	51	< 1%	22
Subtotal		409	1%	6	415	4%	
TOTAL		10,371	37%	158	10,529	95%	

* Crop field: a continuous or non-continuous area of the same crop type on one parcel. The number of crop fields is equal to the number of parcels where that specific type of crop occurs.

Table 9 shows that mixed grass/legume is the main forage & pasture crop type. Most of the pure grass forage is Timothy and Orchard grass (bunch grass). Pure fields of grass or legume are desirable for the speciality feed market which allows the consumer to mix different proportions of grass and alfalfa to best meet their livestock feeding requirements.

Note: This table does not include natural pasture.

Figure 14. Forage & pasture fields by size

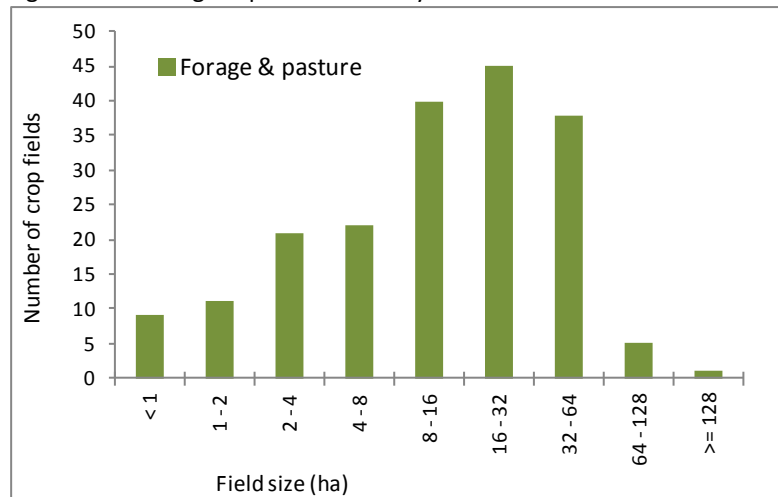


Figure 14 shows that “Forage & pasture” fields occur on a variety of field sizes including fields less than 1 ha.

There are 712 individual “Forage & pasture” fields when separated by detailed crop type. These fields have an average area of 15 ha and median area of 8 ha.

These fields occur on 549 parcels with an average size of 43 ha and a median size of 38 ha.

Figure 15. Forage & pasture fields by size and type

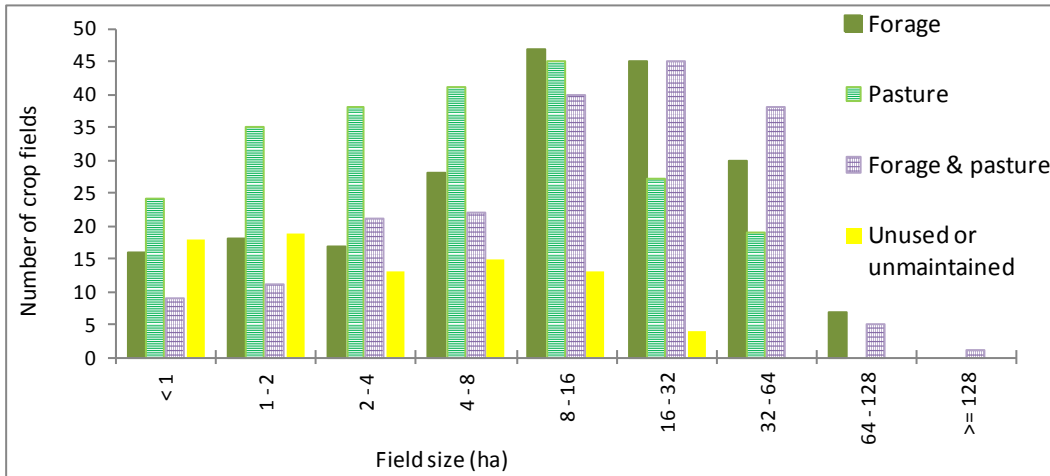


Figure 15 compares forage fields to pasture fields.

There are 208 forage fields with an average area of 18 ha, median area of 12 ha, and an average parcel size of 46 ha.

By comparison, there are 229 pasture fields with an average area of 10 ha, median area of 5 ha, and an average parcel size of 50 ha.

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

Grain crops

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

- **Cereals** are members of the grass family that are 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 noticeable for much of the growing season.

Table 10. Cereals, pulses, oilseeds by area

Cereals, pulses, oilseeds	ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
	In ALR (ha)	% of inventoried ALR area				
Canola	194	< 1%	-	194	2%	10
Barley	163	< 1%	-	163	1%	26
Oats	61	< 1%	5	66	< 1%	14
Field peas	10	< 1%	-	10	< 1%	2
Wheat	6	< 1%	< 1	6	< 1%	1
TOTAL	435	2%	5	440	4%	

* Crop field: a continuous or non-continuous area of the same crop type on one parcel. The number of crop fields is equal to the number of parcels where that specific type of crop occurs.

Table 10 shows the 435 ha of grain crops recorded in the inventory area. Barley is primarily intended for greenfeed production and is often used as a first year cover crop after an old forage field is cultivated and re-seeded.

Local knowledge suggests there is significantly more oat and barley crops in the inventory area than was recorded during the inventory. It is suspected that the photo interpretation and “windshield” survey methods were not sufficient to distinguish grain crops that were far removed from the road.

Figure 16. Cereal, pulses, oilseed fields by size

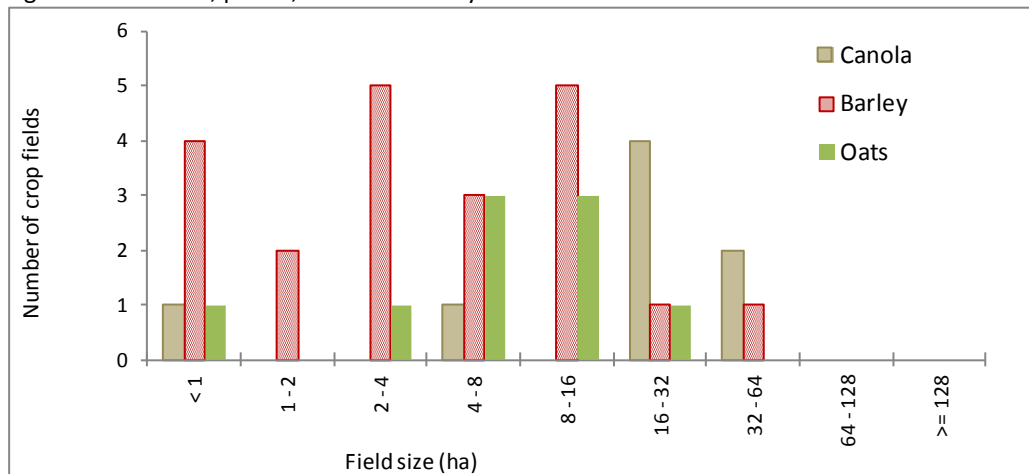


Figure 16 shows the size distribution of all 43 individual grain fields. These 43 fields have an average area of 10 ha and median area of 5 ha. These 43 fields occur on 41 parcels with an average size of 44 ha and a median size of 46 ha.

Individual Crops

Table 11. Individual crop types by area

Detailed crop type	ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
	In ALR (ha)	% of inventoried ALR area				
Forage & pasture (managed)	4,016	14%	35	4,051	37%	195
Forage (managed)	3,523	12%	75	3,598	33%	190
Pasture (unmanaged)	2,243	8%	42	2,284	21%	243
Unused forage/pasture	356	1%	4	360	3%	67
Canola	194	< 1%	-	194	2%	8
Barley	163	< 1%	-	163	1%	23
Forage (unmanaged)	118	< 1%	-	118	1%	23
Oats	61	< 1%	5	66	< 1%	9
Pasture (managed)	62	< 1%	-	62	< 1%	7
Unmaintained forage/pasture	53	< 1%	2	55	< 1%	18
Cultivated land*	34	< 1%	-	34	< 1%	4
Crop transition	20	< 1%	-	20	< 1%	4
Fallow land*	19	< 1%	-	19	< 1%	3
Cover grass	14	< 1%	< 1	14	< 1%	1
Field Peas	10	< 1%	-	10	< 1%	2
Wheat	6	< 1%	< 1	6	< 1%	1
Forestry stock	3	< 1%	-	3	< 1%	1
Nursery	1	< 1%	-	1	< 1%	1
Strawberries	< 1	< 1%	-	< 1	< 1%	1
Floriculture	-	-	< 1	< 1	< 1%	1
Vegetables	< 1	< 1%	-	< 1	< 1%	5
TOTAL	10,899	39%	163	11,062	100%	

* Cultivated land. 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.

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

* Crop field: a continuous or non-continuous area of the same crop type on one parcel. The number of crop fields is equal to the number of parcels where that specific type of crop occurs.

Table 11 shows the individual crops that account for 100% of the cultivated land in the inventory area.

If two or more fields of the same detailed crop type are on one parcel, they are counted as one crop field. One parcel may have several different crop fields.

NATURAL PASTURE & RANGELAND

Natural pastures and rangelands are fenced areas with uncultivated (not sown) natural or semi-natural grasses, herbs or shrubs used for grazing domestic livestock such as cattle, sheep or equines. Natural pastures are smaller fenced areas usually occurring on private land while rangeland refers to larger blocks of land (extensive areas from hundreds to thousands of acres in size) with perimeter fencing that may encompass many parcels or district lots. Rangelands tend to be on provincial Crown land.

Natural pastures are usually on land unsuited for cultivation due to poor soils (stoniness), seasonal flooding, or slope. In many cases, these areas are remote from the infrastructure necessary to facilitate agriculture improvements such as irrigation. Although some of these natural areas could be used for hay, most are grazed since the quality and quantity of hay is usually not worth the harvesting costs. Such natural areas are very susceptible to invasive plant threats.

Most natural pastures and rangelands are influenced by humans to some degree. Fire may be used to control woody plants and remove over mature herbage. Introduction of livestock or equines has an effect on natural vegetation and can lead to changes in vegetation composition. Bush-clearing, fencing, drainage, application of fertilizers and trace elements are more intensive methods which influence natural vegetation as pasture. The introduction of grasses and legumes, without cultivation, is yet a further stage in influencing a natural area. In some cases, these practices have increased susceptibility to invasive plant threats.

Natural pastures and rangelands are captured in a geographical information system at the field or land cover polygon level by the natural vegetation type that dominates the upper canopy (grassland, open treed, etc.). Each vegetation type is then summarized to total land area and evaluated for field size characteristics.

Table 12. Natural pasture vegetation types by area

Natural pasture		ALR		Outside ALR (ha)	Total area (ha)	% of natural pasture
		In ALR (ha)	% of inventoried ALR area			
Pasture (natural)	Herbaceous	2	< 1%	-	2	< 1%
	Shrubland	102	< 1%	15	117	4%
	Treed - closed	2,830	10%	222	3,053	95%
	Treed - open	30	< 1%	-	30	< 1%
TOTAL		2,964	10%	237	3,201	100%

All natural pastures presented here are on privately owned land. Very little Crown land was surveyed as part of this inventory; therefore no significant data on rangeland was captured.

Table 12 shows that 95% of natural pasture is on areas with a land cover of "Treed – closed" where 60% to 100% of crown cover is native trees

Figure 17. Natural pasture areas by size

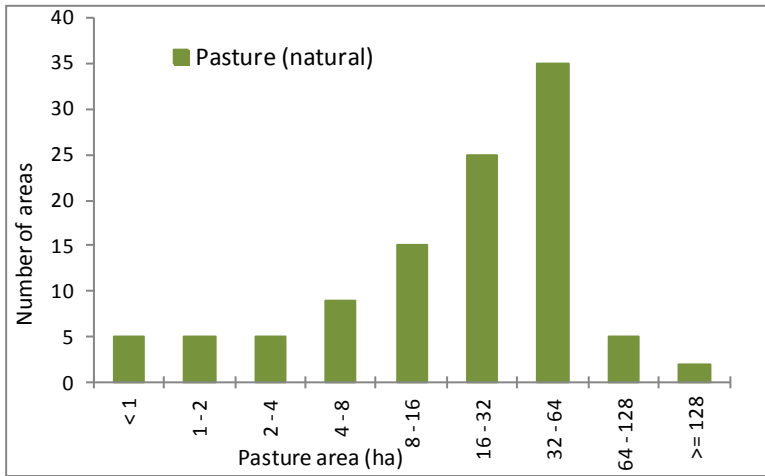


Figure 17 shows that natural pastures are most likely to be 16-32 ha in size.

There are 106 individual natural pastures with an average area of 30 ha and median area of 23 ha. The average size of parcels where natural pasture occurs is 63 ha.

GREENHOUSES & CROP BARNs

Greenhouses are structures covered with translucent material and of sufficient size for a person to work inside¹⁰. They are permanent enclosed glass or polyethylene (poly) structures with or without climate control facilities for growing plants under controlled environments. Non permanent structures such as hoop covers are considered an agricultural practice and are not included here.

Crop barns are permanent structures with non-translucent walls that are used for growing crops such as mushrooms and endive. There are no crop barns found in the inventoried area.

Table 13. Greenhouses by area¹¹

Greenhouses		ALR		Outside ALR (sq m)	Total area (sq m)	Number of greenhouses	Number of parcels	Number of operations
		In ALR (sq m)	% of inventoried ALR					
Poly greenhouse	Reforestation seedling nursery	50,100	< 1%	-	50,100	78	3	2
	Floriculture & Horticulture mix	500	< 1%	200	700	2	2	2
TOTAL		50,600	< 1%	200	50,800	80	5	4

Table 13 presents the greenhouses reported in the inventory area including those associated with two large reforestation seedling nursery operations. PRT Summit Nursery has approximately 33 poly greenhouses covering 18,750 sq m located on two adjacent 4 ha parcels. Woodmere Nursery has approximately 45 poly greenhouses covering 31,350 sq m on one 33 ha parcel. The other two greenhouses are small market garden operations. There are no glass greenhouses or crop barns (e.g. for mushroom production) reported in the inventory area.

Figure 18. Distribution of greenhouses by crop type

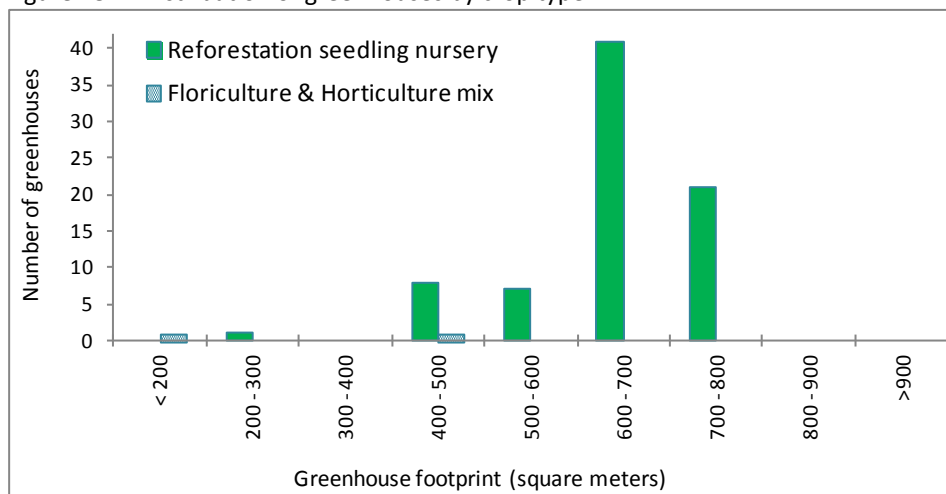


Figure 18 shows the size distribution of the footprint of the 80 poly greenhouses reported in the inventory area.

The most common greenhouse size is 600-700 sq m. All greenhouses > 500 sq m are associated with reforestation seedling nurseries.

Refer to Map 4 for more information.

¹⁰ Source: *Guide for Bylaw Development, 1998 Issue (Working Copy)* by Ministry of Agriculture and Food.

¹¹ The areas reported in this table exclude external yards, parking, warehouses and other infrastructure related to the greenhouse or crop barn operation. Poly refers to polyethylene.

IRRIGATION

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

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

Table 14. Main crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)				Total area irrigated (ha)	% of inventoried crop area irrigated
	Surface	Sprinkler	Giant gun	Landscape / turf		
Forage & pasture	20	44	40	17	121	1%
Cereals, pulses, oilseeds	-	-	-	-	-	-
Cultivated land *	-	-	-	-	-	-
Field forestry stock	-	-	-	-	-	-
Field nursery	-	1	-	-	1	30%
Strawberries	-	< 1	-	-	< 1	100%
Floriculture	-	< 1	-	-	< 1	100%
Mixed vegetables	-	< 1	-	-	< 1	100%
TOTAL FIELD CROP AREA IRRIGATED	20	47	40	17	124	
Greenhouses	-	-	-	-	5	100%
TOTAL AREA IRRIGATED	20	47	40	17	129	

* Cultivated land. 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 14 illustrates that only 1 % of all Forage & pasture crops are irrigated in the inventory area. In total, only 124 ha of cultivated field crops and 5 ha of greenhouses were found to be irrigated.

Refer to Map 4 for more information.

LIVESTOCK

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

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

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

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

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

"Homesite" refers to the location of the main ranch or main barn of a livestock operation or farm unit¹². Often, other types of farm infrastructure, such as corrals, paddocks, barns, feeding/watering facilities, and the farm residence are also at this location. This is the primary location of the farm unit where most livestock management occurs.

"Non-Homesite" refers to a location where livestock are present but related infrastructure is minimal. Often pasture fencing and watering are the only apparent infrastructure improvements. This location is often used only for pasturing livestock and is secondary to an operation's primary (or homesite) location.

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

- **"Very Small"** Approximately 1 cow or horse or bison, 3 hogs, 5 goats or deer, 10 sheep, 50 turkeys, 100 chickens (1 animal unit equivalent),
- **"Small"** LESS THAN 25 cows or horses or bison, 75 hogs, 125 goats or deer, 250 sheep, 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, 5000 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, 5000 turkeys, 10,000 chickens (over 100 animal unit equivalents).

¹² Farm unit includes all the property belonging to a farm and may incorporate more than one parcel.

Table 15. Livestock activities

Livestock group	Livestock detail *	By parcel		Total activities	By activity type		By Homesite	
		Main type	Secondary type		Intensive	Non Intensive	Yes	No
Beef	Beef total	60	2	62	3	59	51	11
Dairy	Dairy total	10	3	13	11	2	11	2
Poultry	Poultry total	6	4	10	-	10	10	-
Swine	Swine total	2	1	3	-	3	3	-
Sheep / lamb / goat	Sheep / lamb	8	4	12	-	12	11	1
	Goat	1	1	2	-	2	2	-
	Sheep / lamb / goat total	9	5	14	-	14	13	1
Llama	Llama total	-	1	1	-	1	1	-
Equine	Horse	70	12	82	-	82	82	-
	Donkey, ass	1	-	1	-	1	1	-
	Mixed equine	1	-	1	-	1	1	-
	Equine total	72	12	84	-	84	84	-
TOTAL		159	28	187	14	173	173	14

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

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

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

Table 15 outlines the livestock identified in the inventoried area. Beef, dairy, sheep/lamb/goat and equines are the most common types of livestock and are further described below.

Although equine operations are very common, the scale of each operation is generally much smaller than beef or dairy operations. See Figure 20 below.

All poultry activities are "very small" scale (< 100 birds) except for 1 "small" scale activity (100 – 2,500 birds).

All swine activities are "very small" scale (< 3 hogs) except for 1 "small" scale activity (3 – 75 hogs).

All llama activities are "very small" scale (< 5 llamas).

Table 16. Beef activities

Scale of beef activity	By parcel		Total number of activities	By activity type		By location	
	Main type	Secondary type		Intensive	Non Intensive	Homesite	Non Homesite
Very small scale (1 cow)	4	-	4	-	4	3	1
Small scale (2 - 25 cattle)	17	1	18	-	18	16	2
Medium scale (25 -100 cattle)	22	1	23	1	22	17	6
Large scale (>100 cattle)	17	-	17	2	15	15	2
TOTAL	60	2	62	3	59	51	11

Table 16 details the 62 beef activities identified in the inventory area. Only 51 of the 61 activities are homesites which indicates there are 51 separate beef operations in the inventory area.

Table 17. Dairy activities

Scale of dairy activity	By parcel		Total number of activities	By activity type		By location	
	Main type	Secondary type		Intensive	Non Intensive	Homesite	Non Homesite
Small scale (1 cow)	-	1	1	-	1	-	1
Medium scale (2 - 25 cattle)	8	2	10	9	1	9	1
Large scale (> 100 cattle)	2	-	2	2	-	2	-
TOTAL	10	3	13	11	2	11	2

Table 17 details the 13 dairy activities identified in the inventory area. Only 11 of the 13 activities are homesites which indicates there are only 11 separate dairy operations in the inventory area.

Table 18. Sheep/lamb/goat activities

Scale of Sheep / lamb / goat activity	By parcel		Total number of activities	By activity type		By location	
	Main type	Secondary type		Intensive	Non Intensive	Homesite	Non Homesite
Goat - Very small scale (5 goats)	1	1	2	-	2	2	-
Sheep / lamb - Very small scale (10 sheep)	3	2	5	-	5	5	-
Sheep / lamb - Small scale (10-250 sheep)	5	2	7	-	7	6	1
TOTAL	9	5	14	-	14	13	1

Table 18 details the 14 sheep/lamb/goat activities. Only 13 of the 14 activities are homesites which indicates there are 13 separate sheep/lamb/goat operations in the inventory area.

Figure 19. Livestock activities (excluding equine) by scale and type

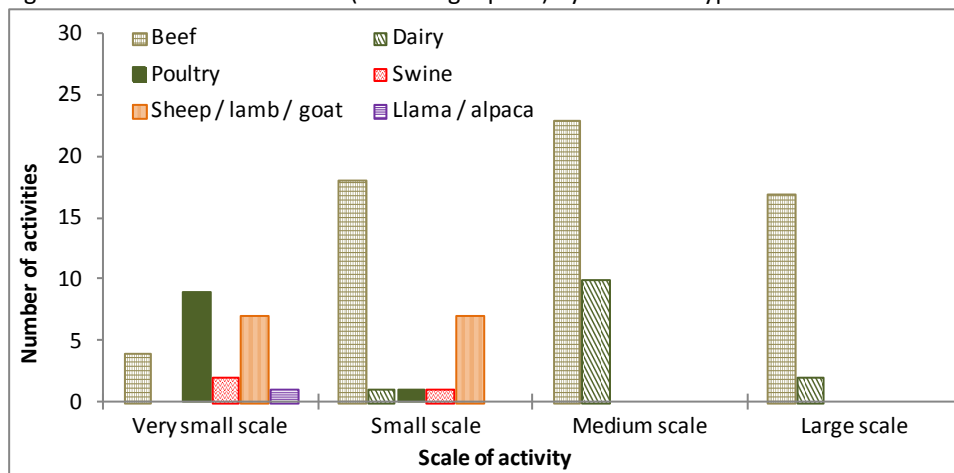


Figure 19 illustrates the scale of all livestock activities (excluding equine).

Poultry, swine, sheep/lamb/goat, and llama/alpaca only occur as "small" or "very small" scale activities.

Almost all dairy activities are intensive, with only one "small" and one "medium" scale operations being non intensive. Dairy is a supply managed industry.

Figure 20. Livestock and equine activities by scale

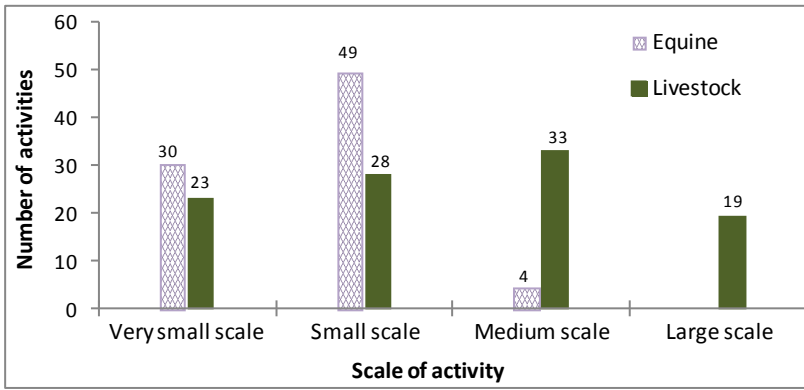


Figure 20 compares the scale of livestock and equine activities.

Even though 84 of the 173 livestock homesites are equine, most are “small” or “very small” scale. There are 19 “large” scale livestock activities, while there are no “large” scale equine activities.

Figure 21. Livestock activities (excluding equine) by parcel size and scale

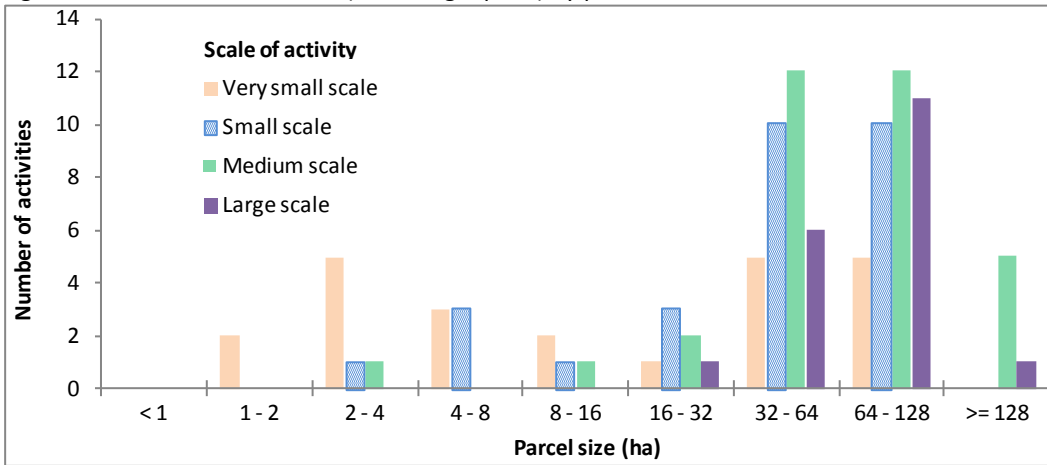


Figure 21 illustrates the distribution of livestock activities (excluding equine) by scale across parcel size categories.

“Small” scale livestock operations occur on nearly all parcel sizes.

Almost all “large” scale livestock activities occur on parcels greater than 32 ha and most occur on parcels greater than 64 ha.

Figure 22. Beef activities (excluding equines) by parcel size and scale

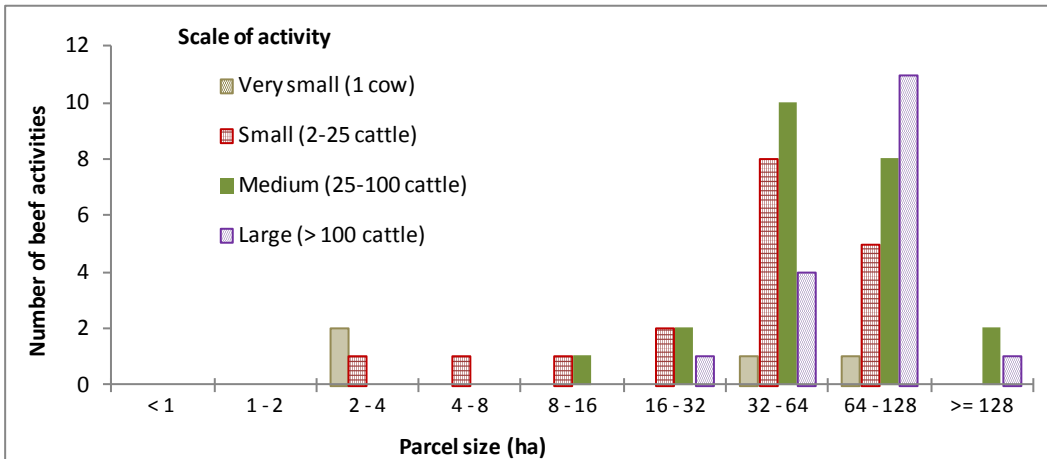


Figure 22 illustrates the distribution of beef activities by scale across parcel size categories.

There is one “large” scale beef activity on a parcel in the 16-32 ha category, but the other 15 “large” scale beef activities all occur on parcels greater than 32 ha.

Most “large” scale beef activities occur on parcels greater than 64 ha.

Figure 23. Livestock activities (excluding equines) by parcel size and type

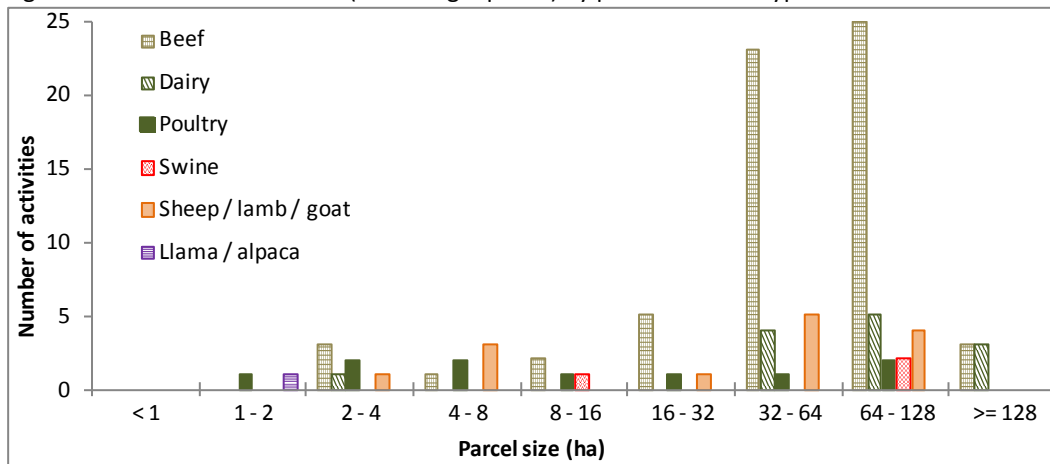


Figure 23 compares the distribution of different livestock types across parcel size categories.

One dairy homesite occurs on a 2-4 ha parcel, but the other 10 dairy homesites all occur on parcels greater than 32 ha.

The majority of the beef homesites occur on parcels greater than 32 ha.

Figure 24. Livestock and equine activities by parcel size

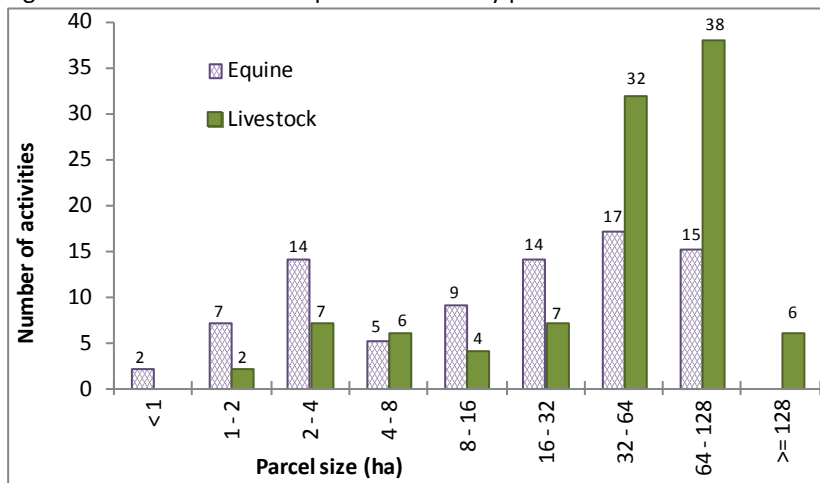


Figure 24 compares the distribution of equine and livestock activities across parcel size categories.

Parcels less than 32 ha are more likely to have equine activities while parcels greater than 32 ha are more likely to have livestock activities.

Figure 25. Average area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

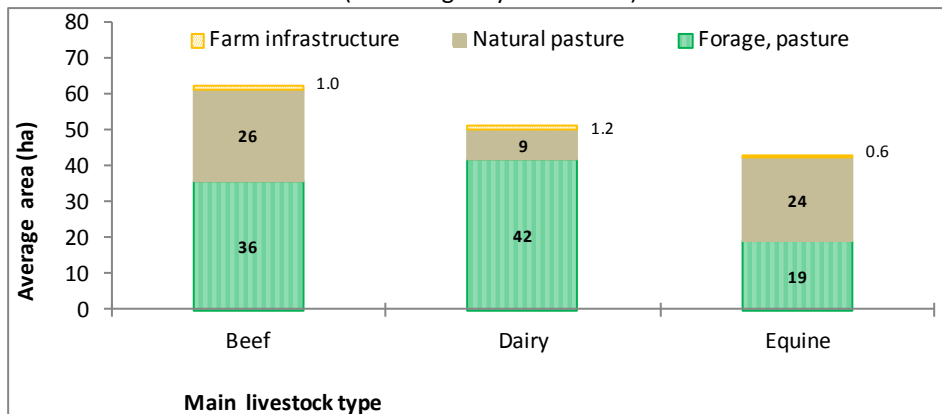


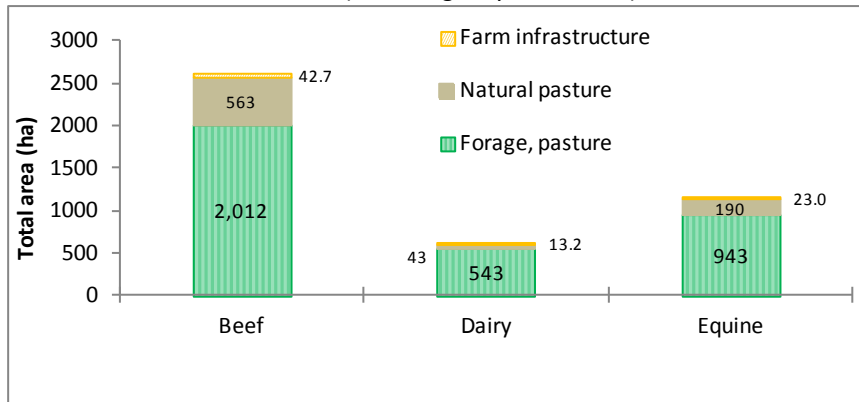
Figure 25 shows that, on average, a beef activity is associated with 36 ha of forage & pasture, 26 ha of natural pasture, and about 1 ha of farm infrastructure.

Comparatively a beef activity utilizes less forage & pasture than a dairy activity but more than an equine activity. This may be attributed to beef's extensive utilization of Crown range.

Comparatively, a dairy activity uses more farm infrastructure than a beef or equine activity.

*Farm Infrastructure includes lands covered by built objects associated with farming. Includes farm buildings, barns, stables, corrals, riding rings, and associated yards

Figure 26. Total area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

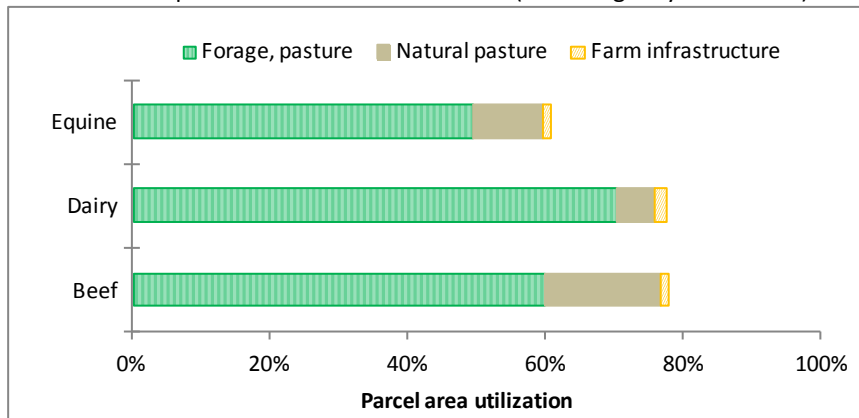


*Farm Infrastructure includes lands covered by built objects associated with farming. Includes farm buildings, barns, stables, corrals, riding rings, and associated yards

Even though each dairy activity on average uses more forage or pasture than beef (see Figure 25 above), Figure 26 shows that beef activities use a much greater total area.

The actual forage area for livestock is often underestimated as not all forage & pasture fields are located on the same parcel as the livestock activity.

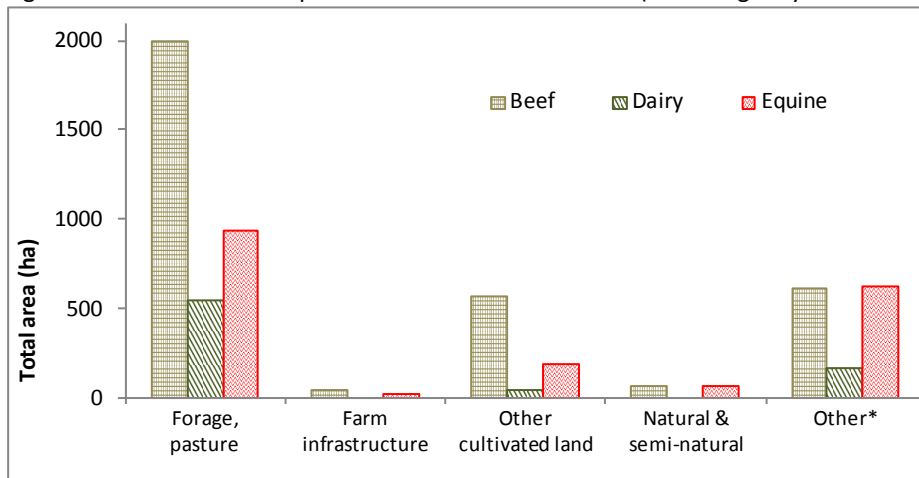
Figure 27. Percent of parcel area utilized for forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)



*Farm Infrastructure includes lands covered by built objects associated with farming. Includes farm buildings, barns, stables, corrals, riding rings, and associated yards

Figure 27 shows that on average, both beef and dairy activities utilize just under 80% of parcel area for forage & pasture, natural pasture, and farm infrastructure while equine activities utilize less at around 60%.

Figure 28. Land cover on parcels with livestock activities (excluding very small scale)



*Farm Infrastructure includes lands covered by built objects associated with farming. Includes farm buildings, barns, stables, corrals, riding rings, and associated yards.
 *Other includes vegetated lands seeded or planted for landscaping, dust, or soil control but not cultivated for harvest or pasture, lands covered by built objects but not farm infrastructure, and bare areas such as piles, pits, fills dumps.

Figure 28 shows that beef, dairy, and equine activities have significant amounts of forage & pasture associated with them. These operations are growing some of their own feed.

ON-FARM VALUE-ADDED

Activities which add value to raw commodities produced on the farm are reported in this section. At least 50% of the commodity utilized must be produced on farm¹³ or the activity is considered non-agricultural and not reported here. In many cases, local knowledge in combination with the field survey is used to determine if an activity meets the criteria to be considered on-farm value-added. The three main categories of value-added are processing, direct sales, and agri-tourism.

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

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

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

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

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

Table 19. Value-added activities by scale and type

Value added	Description				Total number of activities	Average parcel size (ha)
		Small scale	Medium scale	Large scale		
Agri-tourism	Seasonal events	1	1	-	2	48.7
Direct sales	Farm gate	-	2	2	4	14.2
Direct sales	U-pick	-	1	1	2	5.5
TOTAL NUMBER OF ACTIVITIES		1	4	3	8	

Table 19 details the value added activities found in the inventory area.

The two agri-tourism operations offer winter sleigh rides.

One large scale direct sales operation includes both farm gate sales and U-pick strawberries.

One large scale direct sales (farm gate) is actually farmer market sales (Healthy Hugs Organics).

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

5. Condition of ALR Lands

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

PARCEL INCLUSION IN THE ALR

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

- private or Crown municipal owned, and
 - > 0.05 ha in size with at least half their area ($\geq 50\%$) in the ALR, or
 - with at least 10 ha (≥ 10 ha) of ALR land.

In total, 1,732 parcels with a total of 47,047 ha of ALR meet the above criteria and are included in this section of the report. This includes 4 parcels that have less than 50% of their area in the ALR but contain greater than 10 ha of ALR land. Indian reserves are not included in this section of the report.

Of the 1,732 parcels, only 1,111 parcels or 28,285 ha of ALR were inventoried for land use and land cover in 2013. This includes 3 parcels that have less than 50% of their area in the ALR but contain greater than 10 ha of ALR land.

Figure 29. Parcel inclusion in the ALR

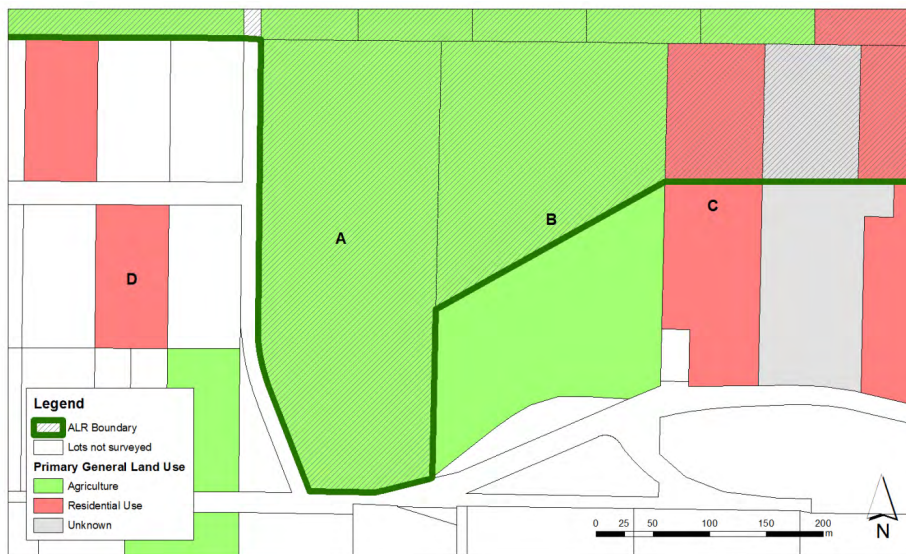


Figure 29 illustrates the distinction between parcels considered to be within or outside the ALR:

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:

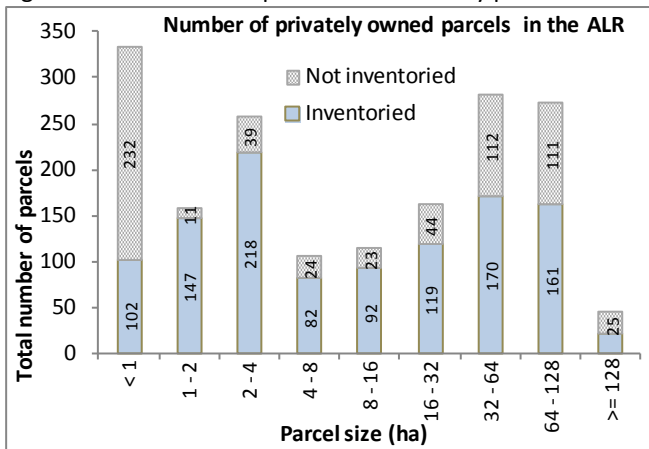
- lot C has less than 50% of its area and less than 10 ha in the ALR
- lot D is completely outside the ALR.

PARCEL SIZE & FARMING IN THE ALR

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

A farming operation may utilize more than one parcel as a farm unit¹⁴, however it is generally more efficient to run a farm on fewer larger parcels than many smaller parcels. Larger parcels accommodate equipment more efficiently and reduce the need to move farm equipment on public roads. Smaller parcels are more impacted by bylaws designed to reduce potential land use conflicts, such as setbacks from lot lines and road allowances, and may encourage alternative land uses such as residential.

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



Of all private owned ALR parcels, 19% are less than one ha. The average ALR parcel size is 27.4 ha.

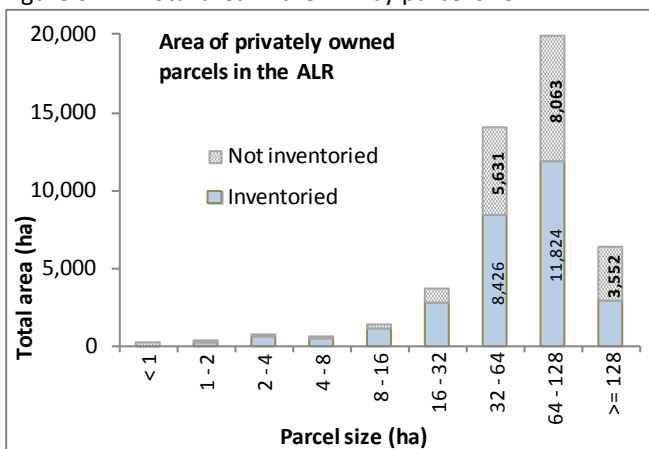
Figure 30 illustrates that of the 1,732 parcels in the ALR:

- 19% (334 parcels) are less than 1 ha.
- 43% (749 parcels) are less than 4 ha.
- 6% (106 parcels) are between 4 ha and 8 ha.
- 7% (115 parcels) are between 8 ha and 16 ha.

44% (762 parcels) are greater than 16 ha.

Only 1,111 of the 1,875 ALR parcels were inventoried for land use and land cover in 2013.

Figure 31. Total area in the ALR by parcel size



Even though there is a large number of small parcels, most of the privately owned ALR is on larger parcels.

Figure 31 illustrates that of the 47,047 ha in the ALR:

- <1% (110 ha) is on parcels less than 1 ha.
- 2% (1,020 ha) is on parcels less than 4 ha.
- 1% (557 ha) is on parcels between 4 ha and 8 ha.
- 3% (1,409 ha) is on parcels between 8 ha and 16 ha.

94% (44,061 ha) is on parcels greater than 16 ha.

Only 28,285 of the 47,047 ha of ALR were inventoried for land use and land cover in 2013.

¹⁴Farm 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 20. Number of farmed and not farmed parcels in the ALR

Parcel status with respect to farming	Number of parcels	% of parcels in the ALR	% of parcels inventoried
Used for farming	445	26 %	40 %
Used for grazing	6	<1 %	<1
Not used for farming or grazing	660	38 %	59 %
Not inventoried	621	36 %	
TOTAL	1732	100 %	100 %

Table 20 demonstrates that of the 1732 private owned parcels in the ALR, 445 or 26% are reported to be "Used for farming".

Of the 621 parcels that did not get inventoried in 2013, 217 are less than one acre.

Figure 32. Number of farmed and not farmed parcels in the ALR by parcel size

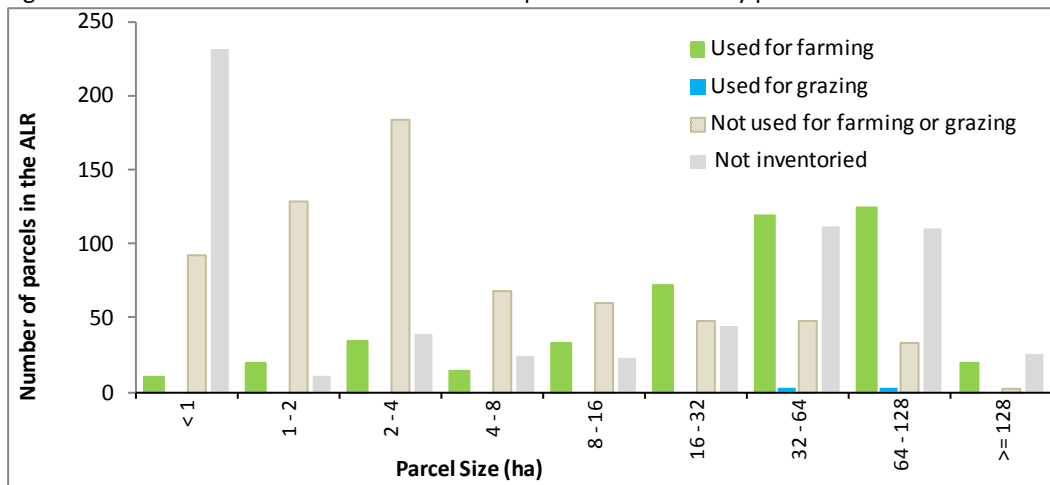


Figure 32 compares the distribution of "Used for farming" parcels with other parcels in the ALR.

The proportion of parcels that are "Used for farming" increases with larger parcels.

Small parcels are less likely to be farmed.

Figure 33. Number of farmed and not farmed parcels in the ALR by parcel size (line chart)

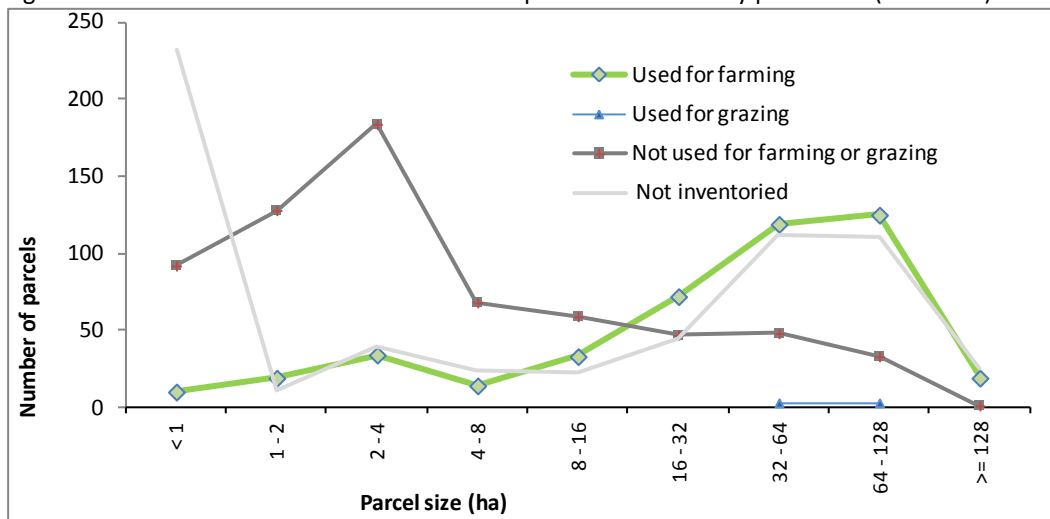


Figure 33 illustrates that although parcels of all sizes are "Used for farming", small parcels are less likely to be farmed.

Figure 34. Proportion of parcels farmed and not farmed by parcel size in the ALR

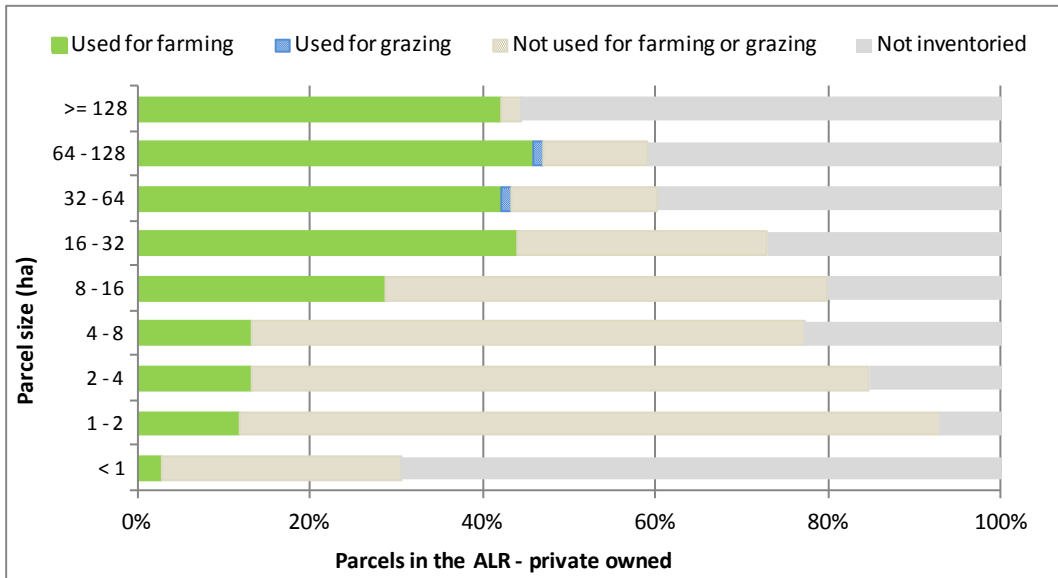
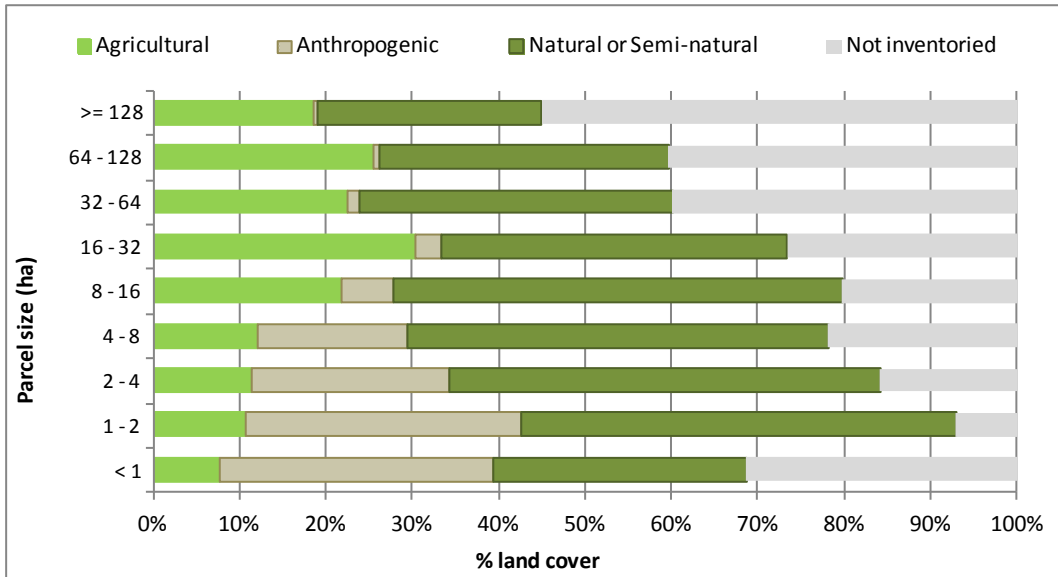


Figure 34 shows that the proportion of parcels "Used for farming" generally increases as the parcel size increases.

Figure 35. Proportion of land cover by parcel size in the ALR



Similar to Figure 34 above, Figure 35 shows that the proportion of farmed land cover generally increases as the parcel size increases.

Appendix A - Maps

Map 1.	Land cover & farmed area	Map1_LandUse_24x39PT.pdf
Map 2.	Land use & farm use	Map2_LandUse_34x39PT.pdf
Map 3.	Availability of land for farming	Map3_Availability_34x39PT.pdf
Map 4.	Farming activities	Map4_FarmAct_34x39PT.pdf
Map 5.	Condition of ALR lands	Map5_CondALR_34x39PT.pdf

Digital format : pdf
Size: 34" x 39" portrait