

Growing Knowledge



Ministry of
Agriculture

Agricultural Land Use Inventory

Reference Number: 800.510-79.2014



Vanderhoof & Electoral Area F Regional District of Bulkley-Nechako Summer 2013



Photo credits: Shirley Hamblin submitted.

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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.....	v
Acronyms	v
Definitions.....	v
Executive Summary.....	1
Agrologist Comments.....	3
Introduction	5
General Community Information	5
Agricultural Land Reserve.....	6
Inventory Area.....	7
Methodology.....	8
Inventory Methodology.....	8
Description of the Data	9
Presentation of the Data	10
Determination of Parcels within the ALR	11
1. Land Cover and Farmed Area.....	12
2. Land Use and Farm Use	14
3. Availability of Land for Farming.....	17
Characteristics of Available Lands.....	20
4. Farming Activities.....	24
Cultivated Field Crops.....	24
Natural Pasture & Rangeland	32
Greenhouses & Crops Barns.....	34
Irrigation.....	35
Livestock.....	37
On-Farm Value-Added.....	44
5. Condition of ALR Lands	45
Parcel Inclusion in the ALR	45
Parcel Size & Farming in the ALR.....	46
Appendix A - Maps.....	49

List of Tables

Table 1.	Land cover and farmed area	13
Table 2.	Land use and farming use by parcel	15
Table 3.	Parcel use and land cover in the ALR	16
Table 4.	Status of the land base with respect to farming.....	18
Table 5.	Land use and cover on parcels “Used for farming” with land available for cultivation	20
Table 6.	Land use and cover on parcels “Not used for farming” with land available for cultivation	22
Table 7.	Main field crop types by area	24
Table 8.	Small scale agriculture by activity	26
Table 9.	Forage & pasture crops by area	28
Table 10.	Cereals and oilseeds by area.....	30
Table 11.	Individual crop types by area	31
Table 12.	Natural pasture vegetation types by area	32
Table 13.	Greenhouses by area	34
Table 14.	Main crop types and irrigation.....	35
Table 15.	Individual crop types and irrigation	36
Table 16.	Livestock activities	38
Table 17.	Beef activities.....	39
Table 18.	Dairy activities.....	39
Table 19.	Sheep / lamb / goat activities	40
Table 20.	Number of farmed and not farmed parcels in the ALR	47

List of Figures

Figure 1.	General location map.....	5
Figure 2.	Agricultural Land Reserve location map.....	6
Figure 3.	Inventory area and Agricultural Land Reserve location map.....	7
Figure 4.	Parcel inclusion in the ALR.....	11
Figure 5.	Land cover and farmed area in the ALR.....	13
Figure 6.	Availability and potential of ALR lands for cultivation.....	19
Figure 7.	Land cover available for cultivation on ALR parcels “Used for farming”	21
Figure 8.	Natural & Semi-natural land cover available for cultivation on ALR parcels “Used for farming”	21
Figure 9.	Land cover available for cultivation on ALR parcels “Not used for farming”	22
Figure 10.	Natural & Semi-natural land cover available for cultivation on ALR parcels “Not used for farming” ...	23
Figure 11.	Size of areas available for cultivation on ALR parcels “Not used for farming”	23
Figure 12.	Parcel size distribution for ALR parcels “Not used for farming” with land available for cultivation	23
Figure 13.	Main field crop types by percentage of cultivated land	25
Figure 14.	All field crops by size.....	25
Figure 15.	Forage & pasture and cereal & oilseed crops by size	25
Figure 16.	Forage & pasture fields by size	29
Figure 17.	Forage & pasture fields by size and type	29
Figure 18.	Cereal & oilseed fields by size.....	30
Figure 19.	Natural pasture areas by size.....	33
Figure 20.	Distribution of greenhouses by crop type	34
Figure 21.	Livestock activities (excluding equine) by scale.....	40
Figure 22.	Livestock and equine activities by scale	40
Figure 23.	Livestock activities (excluding equine) by parcel size and scale	41
Figure 24.	Beef activities by parcel size and scale	41
Figure 25.	Livestock activities (excluding equines) by parcel size and type	41
Figure 26.	Livestock and equine activities by parcel size.....	42
Figure 27.	Average area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)	42
Figure 28.	Total area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale).....	42
Figure 29.	Percent of parcel area utilized for forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)	43
Figure 30.	Land cover on parcels with livestock activities (excluding very small scale)	43
Figure 31.	Parcel inclusion in the ALR.....	45
Figure 32.	Number of parcels in the ALR by parcel size.....	46
Figure 33.	Total area in the ALR by parcel size	46
Figure 34.	Number of farmed and not farmed parcels in the ALR by parcel size.....	47
Figure 35.	Number of farmed and not farmed parcels in the ALR by parcel size (line chart)	47
Figure 36.	Proportion of parcels farmed and not farmed by parcel size in the ALR.....	48
Figure 37.	Proportion of land cover by parcel size on parcels in the ALR	48

List of Maps

- 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 classification, which is useful for land use surveys.

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

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

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

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

Land Cover

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

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

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

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

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

Anthropogenic – Residential footprint – Includes the main residence plus its associated yard, driveway, parking and any auxiliary buildings or structures. When two residences are on a property, areas associated 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.

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, and abandoned or unused structures.

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

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

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 ha (approximately 1 acre) since most of the parcel is covered by built structures, pavement and landscaping.

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

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

Executive Summary

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 RDBN and the BC Ministry of Agriculture (AGRI) conducted an ALUI in the District of Vanderhoof and the surrounding area of Electoral Area F. 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, 37,370 ha on 908 private parcels were inventoried in 2013 and thus form the basis of this report. This includes 36,799 ha of land on 873 parcels inside the ALR and 571 ha of land on 35 parcels outside the ALR.

A further 57,187 ha of land met the criteria above, but was not inventoried due to time constraints and distance from the District of Vanderhoof. 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 F.

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 19,459 ha or 53% of the inventoried ALR is actively farmed. An additional 147 ha of land outside the ALR is farmed. A total of 6,221 ha or 17% of the inventoried ALR has limited potential for cultivation due to topographical, physical or operational constraints and 9,655 ha or 26% 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 30,816 ha or 84% of the inventoried ALR is on parcels “Used for farming”. By parcel count, 491 parcels or 56% of the ALR parcels inventoried are “Used for farming”. See Table 2 and Map 2 for more details.

There are 19,473 ha of cultivated land in the inventory area with 19,319 ha in the ALR and 154 ha outside the ALR. The most common crop is forage and pasture with 14,800 ha or 76% of all cultivated land. There are 4,179 ha of grain crops including canola, barley, oats, and wheat. In addition to the cultivated field crops, there are 5,108 ha of natural pasture and 3 poly greenhouses on 1 greenhouse operation. 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 69 greenhouses, 10 mixed gardens and 67 vegetable gardens for a total of 146 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 rare with only 9% of cultivated land in the inventoried area or 1,707 ha under irrigation. 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 63 beef operations including 16 large scale (> 100 cattle) operations with 1 intensive feedlot, 31 medium scale (25 – 100 cattle) operations with 1 intensive feedlot, and 16 small (< 2 – 25 cattle) or very small scale (1 cow) operations. There are 3 dairy operations including 1 large scale (> 100 cattle) intensive operation and 2 very small scale (1 cow) non-intensive operations. There are 4 small scale sheep/lamb operations and 4 small scale goat 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 73 out of 167 livestock operations, however all are “non-intensive” and only 3 have more than 25 animals. See Tables 15, 16, 17 and Map 4 for more information.

A parcel size analysis was conducted on all 1,940 privately owned ALR parcels in the District of Vanderhoof and Electoral Area F including those parcels not inventoried in 2013. Of these parcels, the average parcel size is 48 ha, 6% are less than one ha, 22% are less than 4 ha, 491 (25%) are “Used for farming”, 9 (<1%) are “Used for grazing”, 373 (19%) are “Not used for farming or grazing”, and 1,067 (55%) 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 insight into the current status of agriculture to help inform decisions on how to best manage the agricultural land base in order to support and strengthen farming in the future.

Agrologist Comments

Agriculture has contributed greatly to the settlement and development of the Vanderhoof area. Driven initially by the Grand Trunk Pacific Railway's land sales, this area is one of the earliest known agricultural settlements in BC. The fertile Nechako Valley and Plateau quickly gained a reputation for being the "hay basket" of the Central Interior-Northwest due to its prolific forage production. Such forage production has enabled the development of a strong livestock sector which is currently dominated by beef. The area offers significant growth potential in any livestock sector that relies on forage availability including sheep and goat production.

The climate of the area is very favourable to forage production, including alfalfa and grass hay production as well as grain and oilseed production. Average annual rainfall is 330 mm and the June rainfall normally determines what the growing season will herald for crop productivity. Vanderhoof's fall season weather is more conducive to cereal harvesting than any other agricultural area along Highway 16. Frost-free days are typically around 53 days per annum but do vary according to geographical characteristics. Short season crops are best suited to the area. Irrigation of cropland is very scarce, however there are many existing fields with the size, shape (fairly flat) and arability necessary to consider investment in irrigation economically feasible. The Nechako River is a reliable source of irrigation water but may be tempered by other demands such as the Kemano Reservoir management.

It is well known that the agriculture capability of the Vanderhoof area is not being fully realized on both land use and ALR land base fronts. In addition to the numerous private and Crown parcels in the ALR not currently being farmed, there are 10,519 ha of Crown land designated as agriculture development areas (ADA land) on the edges of the existing agriculture settlement. The potential for agriculture expansion and development is significant. Historically primary agriculture production (i.e. beef cow-calf operations which ship to Alberta for finishing and processing) has been the focus, but in the last thirty years the development of more and larger scale beef feedlots as well as a stronger beef back-grounding sector has fostered more cereal production. The quality alfalfa hay from the Vanderhoof area sustains many dairy farms along Highways 16 and 97 and the quality timothy hay finds its way to local and provincial horse hay markets. The significant agricultural land base can support increased value-added and specialty product development that is vital to the realization of the full potential of the agriculture sector in the area; potential that will be realized as profitability improves in key areas of the agriculture sector.

The agricultural productivity and diversity of the area is slowly rebuilding as organizations such as the Vanderhoof Farmer's Market, Nechako Valley Exhibition, Nechako Valley Food Network, and others continue to showcase and promote products and producers. Distance to markets continues to shrink as access to a growing population in Prince George offers increasing market opportunities. Local Class A provincially licensed abattoirs foster access to provincial meat markets such as the lower mainland. The container shipping Port of Prince Rupert encourages investigation of off-shore Asian market opportunities.

The relevance of the local agriculture value-added operations is not well recognized in this report because neither of the two abattoirs or the two hay compression plants meets the criteria for "on-farm value added" (greater than 50% of the commodity utilized is produced on the same farm as the operation) even though they are on ALR land. What is relevant is how important and valuable such value added operations are to the area's agriculture profitability and diversity. For example, both the red meat abattoir and the poultry-rabbit abattoir contribute significant opportunities for area livestock

producers to diversify, add value and capture local and provincial niche market opportunities. Similarly, the two new hay compression plants have generated incredible hope and excitement for alfalfa and timothy hay producers because of the opportunity for significant sales into the Asian markets. It is expected that an increased pursuit of high value hay sales will also generate a greater volume of medium quality hay that will benefit local beef production.

The Vanderhoof agricultural area straddles the Highway 16 (Yellowhead) corridor. The traffic along this corridor during the tourist season offers marketing opportunities for more local agriculture products and services. Vanderhoof is home to the most westerly livestock auction market (BC Livestock) which channels thousands of beef animals from along Highway 16 to regional buyers as well as many more eastern and southern buyers. The livestock auction also hosts premier bull sales each spring allowing commercial cattlemen along Highway 16 and beyond to take advantage of local and regional purebred beef genetics.

Many of the issues facing agriculture in the Vanderhoof area are outlined in the Agriculture Plan published by the Regional District of Bulkley-Nechako in 2012. One such issue that was well evident during the field survey component of this inventory was the threat of invasive plant species to ALR land not being farmed as well as farmland adjacent to land on which invasive plant species are not being controlled or managed.

Overall, the Vanderhoof area has a tremendous wealth of existing agriculture experts and entrepreneurs, some well developed farm infrastructure, and huge potential given the quality and quantity of the land base available for agricultural production.

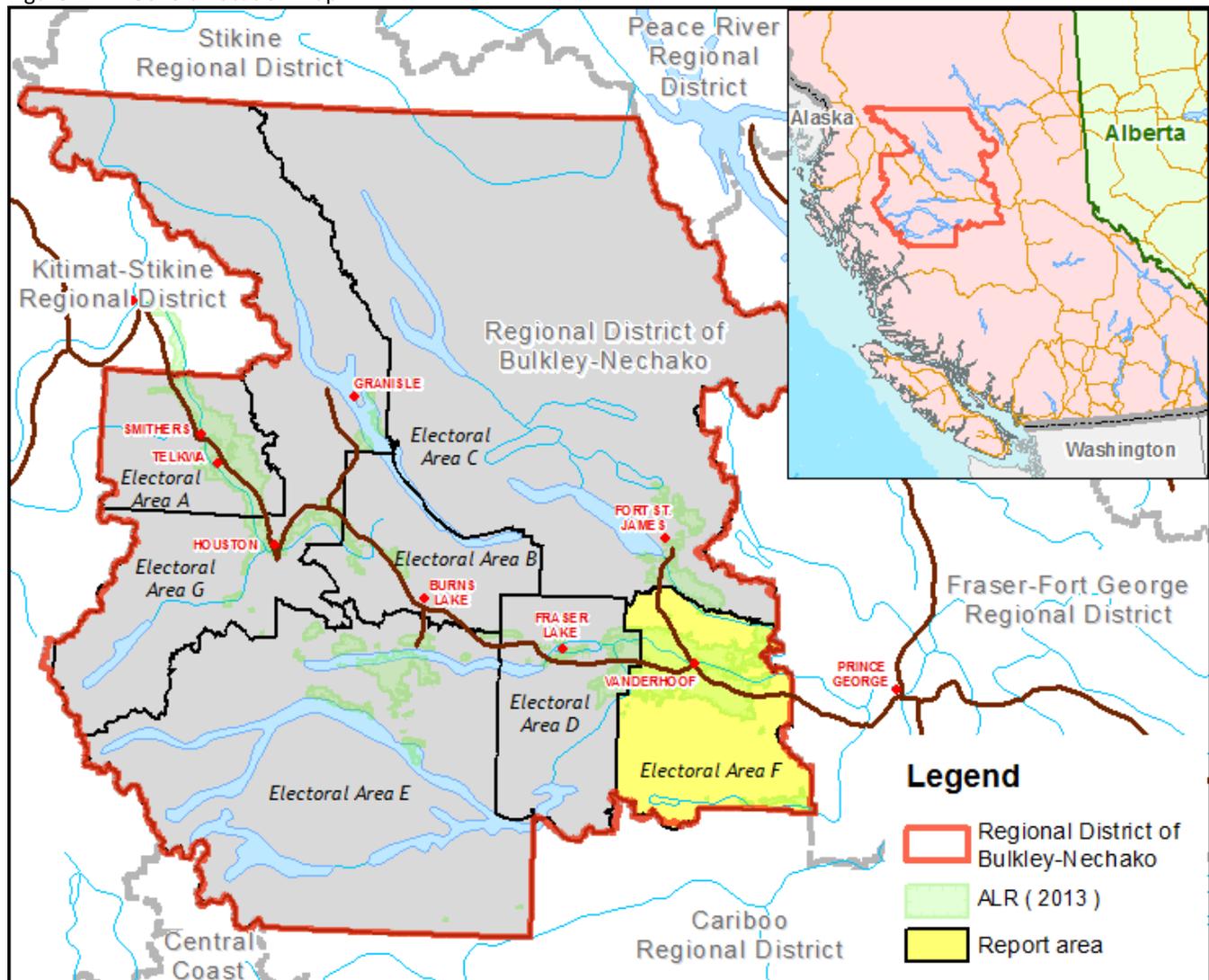
Introduction

GENERAL COMMUNITY INFORMATION

The District of Vanderhoof (pop. 4,480)³ is located in the Nechako Valley of northwestern BC, on the Trans Canada Highway (Yellowhead Route 16), approximately 620 km east of Prince Rupert and 98 km west of Prince George. Electoral Area F (pop. 3,702)¹ is the surrounding rural area and includes the unincorporated communities of Engen and Cluculz Lake. All are within the Regional District of Bulkley-Nechako (RDBN). The area also contains the main community of the Saik'uz First Nation at the Stony Creek Indian Reserve in addition to several other reserves. The Nazko Indian Band, Nadleh Whut'en First Nation and Nak'azdli Band also identify traditional lands within the area.

Vanderhoof is Dutch for 'of the farm', which is appropriate given that Vanderhoof was one of the first agricultural settlements in BC. Located on a plateau above the valley bottom, the area is abundant with productive agricultural lands and forests. The main industries are forestry, agriculture and tourism⁴.

Figure 1. General location map



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

⁴ District of Vanderhoof website; <http://www.vanderhoof.ca/District/Vanderhoof.html>

AGRICULTURAL LAND RESERVE

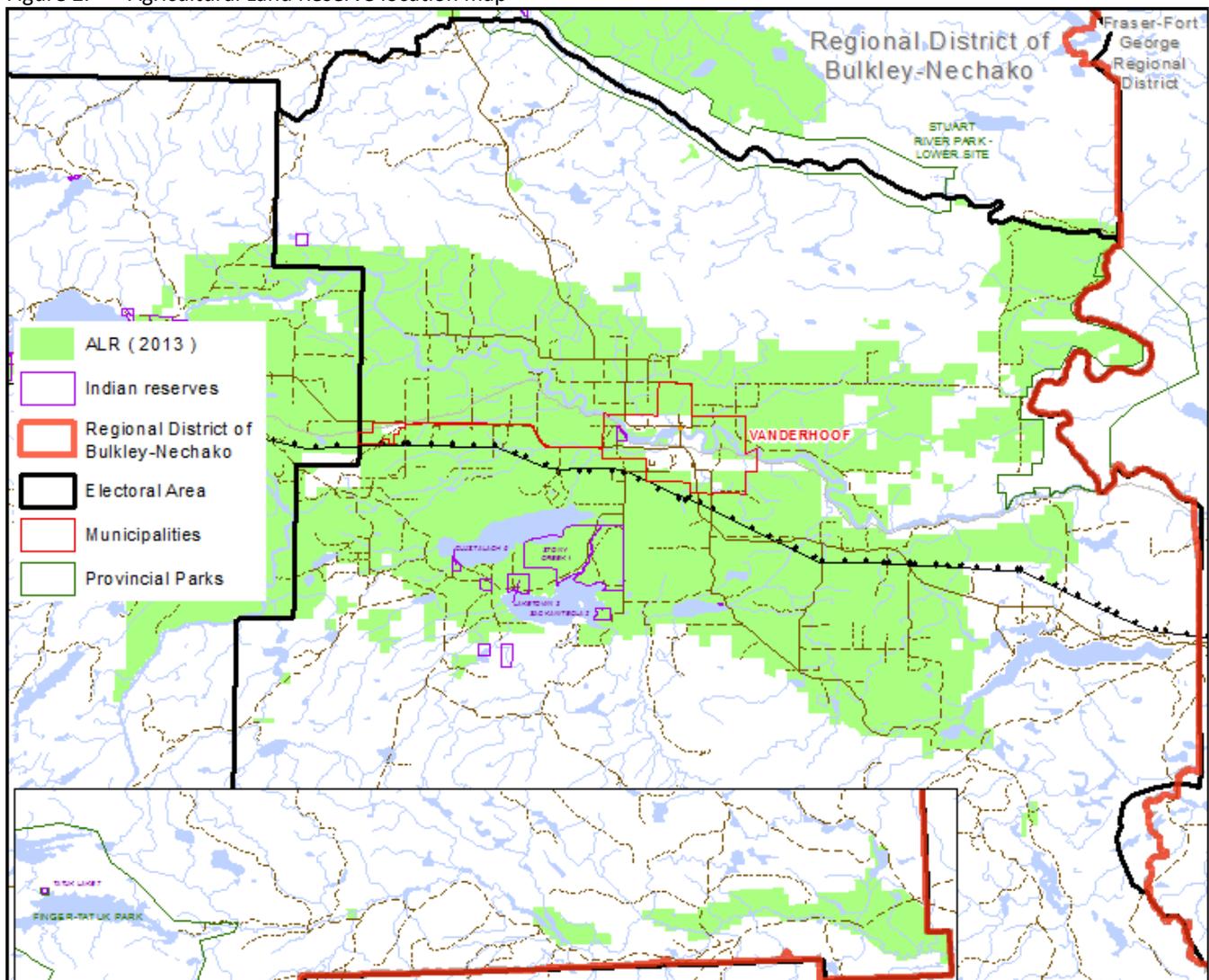
The Agricultural Land Reserve (ALR) is a provincial land use zone designated in 1973 where agriculture is recognized as the priority use. Within the ALR, farming is encouraged and non-agricultural uses are controlled.

In the RDBN, there is 373,405 ha⁵ of ALR land (shown in Figure 1); 129,682 ha⁶ or 35% is within the area of interest (District of Vanderhoof and Electoral Area F).

The total size of the area of interest is 566,085 ha⁷. With 129,682 ha⁴ of ALR, almost 23% of the area is in the ALR. This includes 119,920 ha³ in legal land parcels, 3,038 ha in Indian reserves, and 6,724 ha⁵ outside legal land parcels in Crown land, rights-of-way, or water. The ALR in legal land parcels includes

- 3,567 ha⁵ or 3% of the legal land parcels in the District of Vanderhoof;
- 116,353 ha⁵ or 97% of the legal land parcels in Electoral Area F.

Figure 2. Agricultural Land Reserve location map



⁵ 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.

⁶ Agricultural Land Commission, ALR mapping, Land and Resource Data Warehouse, 2012-10-31 (area calculated in GIS).

⁷ Calculated in GIS.

INVENTORY AREA

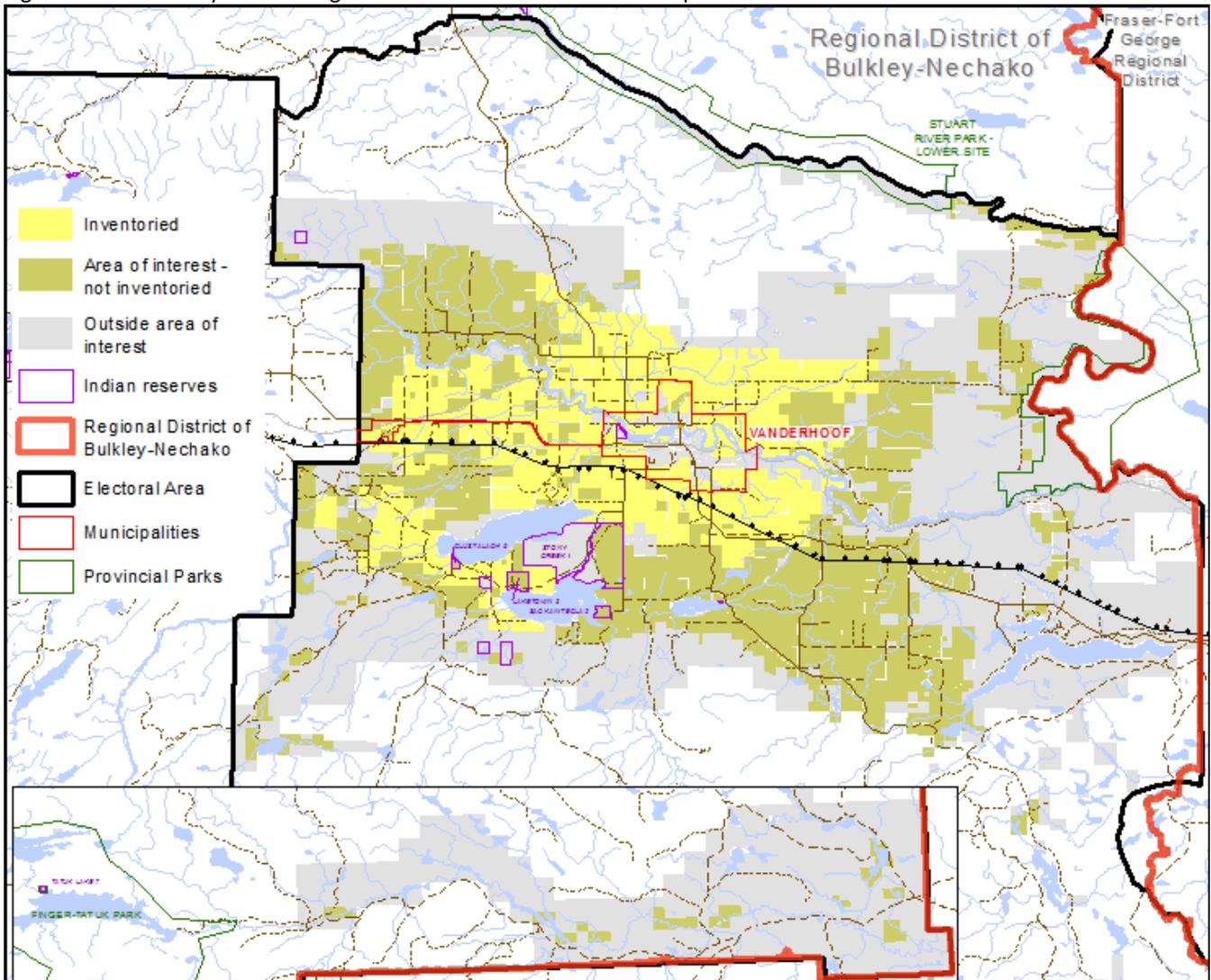
Only land where there is a probability of agriculture is considered for inventory. This includes land on

- legal land parcels privately owned greater than 1 acre⁸; 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 1,974 parcels and 5 Indian reserves (Stony Creek 1, Laketown 3, Sackanitecla 2, Clustalach 5, and Tatuk Lake 7) meet the above criteria (98,376 ha total area, 93,986 ha ALR area). Excluded are ALR land on Crown parcels (28,972 ha) or ALR land outside legal land parcels (6,724 ha).

In 2013, 908 parcels (37,370 ha total area, 36,799 ha ALR area) were field inventoried including 186 parcels in the District of Vanderhoof. This field data provides the basis for this report.

Figure 3. Inventory area and Agricultural Land Reserve location map



⁸ One acre is approximately 0.404 ha.

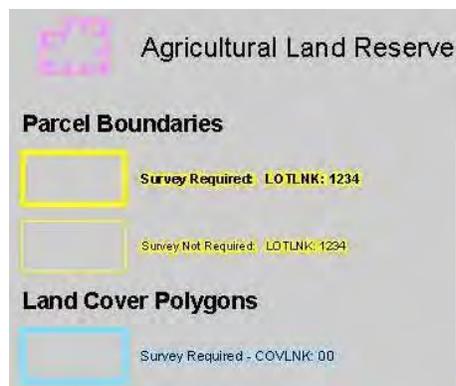
Methodology

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 Vanderhoof land use inventory was conducted in the summer of 2013 by a RDBN Planning Technician with the assistance of a contract agrologist. 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)⁹;
- Unique identifier for each legal parcel ;
- The preliminary land cover polygon boundaries (digitized prior to field survey using aerial photography);
- Unique identifier for each preliminary land cover polygon;
- The boundary of the Agricultural Land Reserve (ALR);
- Base features such as streets, street names, watercourses and contours;
- Aerial photography.



⁹ 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 which add value to raw agricultural products.

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

General land use:

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

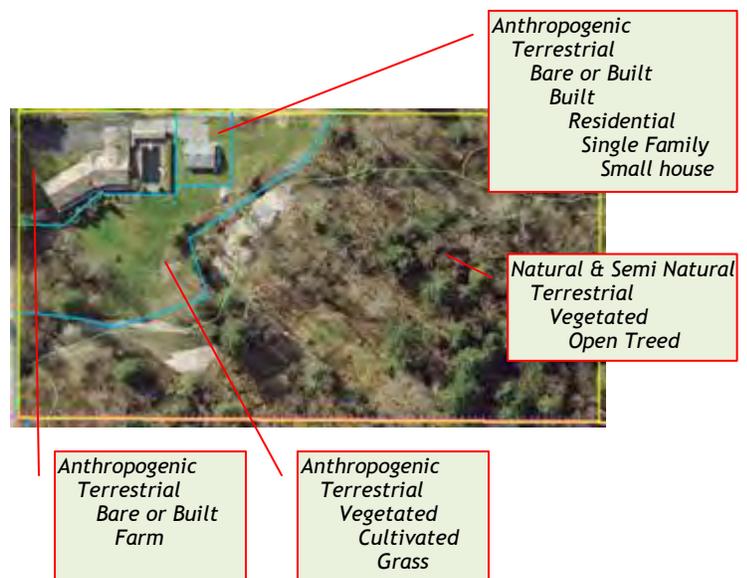
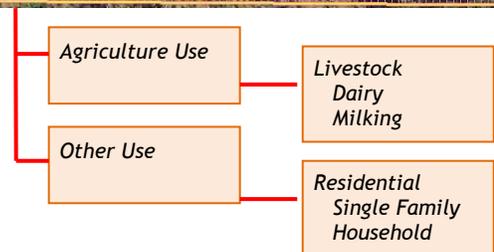
- The actual human use of land and related structures and modifications to the landscape
- Use-related land cover (where land cover implies a use or is important to interpreting patterns of use)
- Declared interests in the land (which may limit use) such as parks

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

Land cover:

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

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



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

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

Agricultural crop production: Crop production and crop protection methods observed on the parcel were recorded. These included wildlife scare devices, temperature or light control, and 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 includes 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 were preserved throughout the summarization process to maintain precision. In the final formatting of the summarized tables and charts, data values were 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.

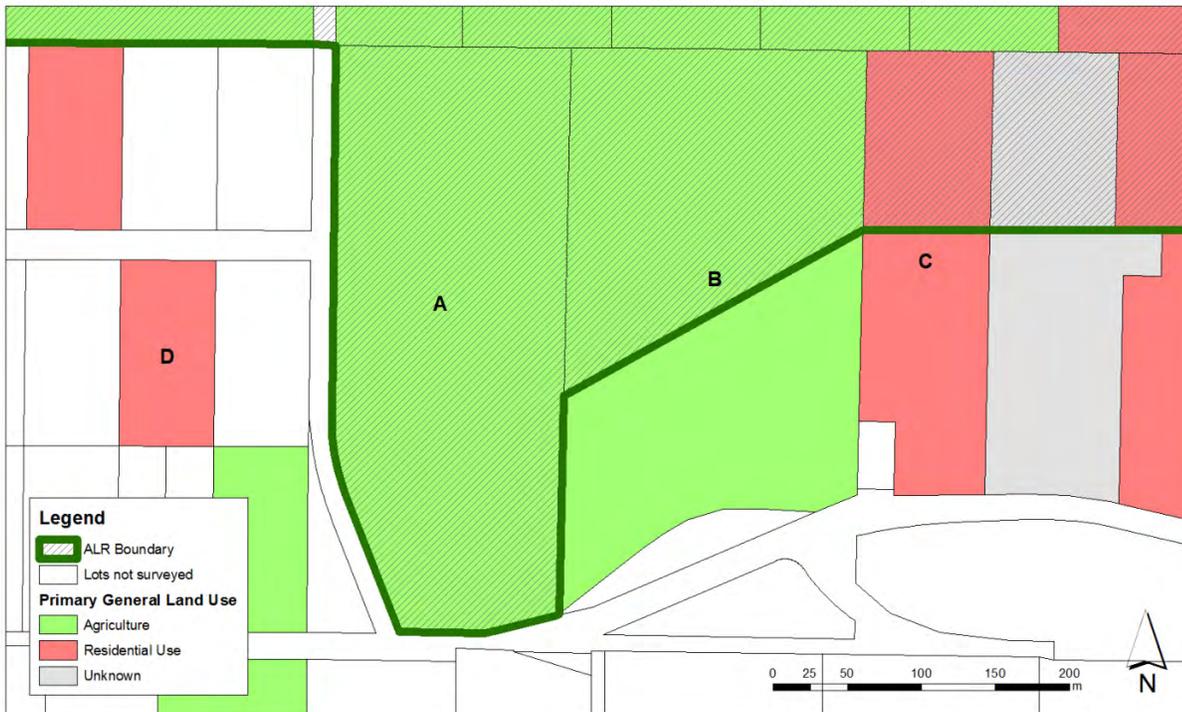
Figure 4 illustrates the frequent misalignment between parcel boundaries and the ALR boundary. Given that the dark green line represents the ALR boundary, Lot A is completely in the ALR and Lots B and C have only a portion of their area in the ALR. Lot D is completely outside the ALR.

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, only 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	19,152	52%	138	19,290
	Farm infrastructure	306	< 1%	9	315
	Greenhouses	-	-	<1	<1
Inactively farmed	Unmaintained field crops	60	< 1%	-	60
	Unused forage or pasture	106	< 1%	16	123
FARMED SUBTOTAL		19,626	53%	163	19,789
Anthropogenic (not farmed)	Managed vegetation	391	1%	11	402
	Non Built or Bare	161	< 1%	<1	161
	Residential footprint	38	< 1%	<1	39
	Settlement	39	< 1%	81	120
	Transportation	199	< 1%	19	218
	Built up - Other	3	< 1%	-	3
	Waterbodies	17	< 1%	1	18
SUBTOTAL		849	2%	113	962
Natural and Semi-natural	Natural pasture or rangeland	5,083	14%	25	5,108
	Vegetated	10,238	28%	257	10,495
	Wetlands	740	2%	4	744
	Waterbodies	65	< 1%	9	74
SUBTOTAL		16,126	44%	295	16,421
	Unknown	199	< 1%	-	199
TOTAL		36,799	100%	571	37,370
Not inventoried	Not inventoried	57,187			
	Excluded Crown parcels	28,972			
	Outside legal parcels	6,724			
SUBTOTAL		92,883			
TOTAL		129,682			

* 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 19,789 ha in "Farmed" land cover although 183 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 is included as Natural and Semi-natural.

Refer to Map 1 for more information.

Figure 5. Land cover and farmed area in the ALR

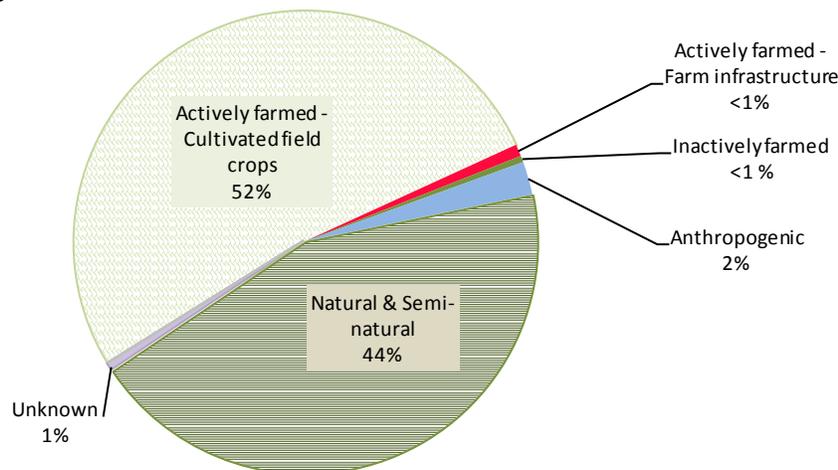


Figure 5 shows the proportions of land cover types across the inventoried ALR.

The dominant land cover is "Actively Farmed-Cultivated field crops" at 52%.

A significant portion of the inventoried ALR is in "Natural and Semi-natural" land cover which includes land used as natural pasture.

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 area	Number of ALR parcels	% of ALR parcels				
Used only for farming - no other use		13,821	38 %	201	23 %	102	3	13,923	68
Used for farming - Mixed use	Residential	14,467	39 %	255	29 %	143	6	14,610	56
	Utilities	895	2 %	10	1 %	< 1	-	895	89
	Land in transition	633	2 %	7	<1 %	< 1	-	633	90
	Industrial	616	2 %	11	1 %	< 1	-	616	56
	Transportation - airport	119	<1 %	1	<1 %	-	-	119	119
	Forestry	114	<1 %	1	<1 %	-	-	114	114
	Industrial - agriculture related	78	<1 %	3	<1 %	< 1	-	78	26
	Transportation	58	<1 %	1	<1 %	< 1	-	58	58
	Institutional & community	16	<1 %	1	<1 %	-	-	16	16
USED FOR FARMING SUBTOTAL		30,816	84 %	491	56 %	245	9	31,061	
Used only for grazing - no other use		147	<1 %	2	<1 %	-	-	147	73
Used for grazing - Mixed use	Residential	238	<1 %	6	<1 %	16	1	254	36
	Forestry	34	<1 %	1	<1 %	< 1	-	34	34
USED FOR GRAZING SUBTOTAL		419	1 %	9	1 %	16	1	435	
Not used for farming or grazing	Residential	2,372	6 %	216	25 %	43	7	2,414	11
	No apparent use	1,964	5 %	62	7 %	141	7	2,105	31
	Industrial	603	2 %	16	2 %	89	3	692	36
	Transportation	198	<1 %	44	5 %	27	6	226	5
	Forestry	181	<1 %	2	<1 %	< 1	-	181	91
	Transportation - airport	141	<1 %	3	<1 %	< 1	-	141	47
	Recreation & leisure	86	<1 %	22	3 %	7	-	92	4
	Institutional & community	11	<1 %	5	<1 %	2	1	13	2
	Land in transition	7	<1 %	2	<1 %	< 1	1	8	3
	Water management	< 1	<1 %	1	<1 %	< 1	-	< 1	< 1
NOT USED FOR FARMING OR GRAZING SUBTOTAL		5,564	15 %	373	43 %	310	25	5,874	
TOTAL		36,799	100 %	873	100 %	571	35	37,370	
Not inventoried	Not inventoried	57,187							
	Excluded Crown parcels	28,972							
	Outside legal parcels	6,724							
SUBTOTAL		92,883							
TOTAL		129,682							

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

Table 2 shows that 30,816 ha or 84% of the inventoried ALR is on 491 parcels "Used for farming". In addition, there were 9 parcels outside the ALR that were "Used for farming".

Many "Used for Farming" parcels are also used for other purposes with only 201 parcels or 23% of the inventoried ALR parcels exclusively "Used for farming."

Two of the "Used for farming, Industrial – agriculture related" parcels are hay compression operations, Top Hay Agri Industries and Nechako Valley Agri Ltd. Both operations purchase alfalfa and Timothy hay to compress and export to Eastern Asia and the Middle East for various livestock consumption.

The third "Used for farming, Industrial – agriculture related" parcel is Country Locker Meats, a custom meat slaughter and processer with both retail and commercial sales specializing in conventional livestock.

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			Unknown
		In ALR (ha)	% of inventoried ALR area	In ALR (ha)	% of inventoried ALR area	In ALR (ha)	% of inventoried ALR area		In ALR (ha)
Used only for farming - no other use		8,819	24 %	50	<1 %	4,899	13 %	54	13,821
Used for farming - Mixed use	Residential	8,982	24 %	203	<1 %	5,267	14 %	15	14,467
	Utilities	632	2 %	< 1	<1 %	262	<1 %	-	895
	Land in transition	349	<1 %	41	<1 %	243	<1 %	-	633
	Industrial	305	<1 %	33	<1 %	268	<1 %	9	616
	Transportation - airport	88	<1 %	29	<1 %	2	<1 %	-	119
	Forestry	21	<1 %	-	-	93	<1 %	-	114
	Industrial - agriculture related	26	<1 %	23	<1 %	30	<1 %	-	78
	Transportation	46	<1 %	-	-	12	<1 %	-	58
Institutional & community	8	<1 %	1	<1 %	7	<1 %	-	16	
TOTAL USED FOR FARMING		19,275	52 %	381	1 %	11,081	30 %	78	30,816

Table 3 combines land use and land cover on parcels "Used for farming". For example, inventoried parcels with the mixed use "Used for farming" and "Residential" have a total of 8,982 ha in "Farmed" land cover, 203 ha in "Anthropogenic" (not farmed) land cover, and 5,267 ha in "Natural & Semi-natural" land cover.

Although 30,816 ha or 84% of inventoried ALR is on parcels "Used for farming" (refer to Table 2), only 19,275 ha 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 growth¹⁰. 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 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 District of Vanderhoof and Electoral Area F, properties in the ALR and “Used for farming” have an average assessed land and improvement value of \$2,299 per ha.

Properties in the ALR that are considered “Unavailable for farming” have an average assessed land and improvement value of \$32,631 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.

¹⁰ 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	19,152	52 %	138	19,290
	Farm infrastructure	306	<1 %	9	315
	Greenhouses	-	-	< 1	< 1
ACTIVELY FARMED		19,459	53 %	147	19,606
Anthropogenic areas supporting farming	Transportation	28	<1 %	< 1	28
	Residential footprint	15	<1 %	< 1	16
	Artificial Waterbodies	15	<1 %	< 1	16
SUPPORTING FARMING		58	<1 %	1	59
Unavailable for farming due to existing land use	Transportation	123	<1 %	27	151
	Transportation - airport	79	<1 %	< 1	80
	Industrial	53	<1 %	50	102
	Residential	38	<1 %	3	41
	Recreation & leisure	22	<1 %	4	26
	Institutional & community	7	<1 %	2	9
	Water management	< 1	<1 %	< 1	< 1
	Land in transition	< 1	<1 %	< 1	< 1
Unavailable for farming due to existing land cover	Wetlands	740	2 %	4	743
	Waterbodies	66	<1 %	8	74
	Transportation	40	<1 %	< 1	40
	Built up - Other	23	<1 %	31	53
	Residential footprint	16	<1 %	< 1	16
UNAVAILABLE FOR FARMING		1,207	3 %	130	1,336
Site limitations	Topography &/or soils	4,850	13 %	146	4,997
	Riparian, Drainage, Buffer	1,326	4 %	25	1,351
	Operational	26	<1 %	< 1	26
	Flooding	19	<1 %	-	19
LIMITED POTENTIAL FOR CULTIVATION		6,221	17 %	171	6,393
Available & with potential for cultivation	Natural & Semi-natural - Vegetation	5,998	16 %	77	6,075
	Natural pasture or rangeland	3,091	8 %	21	3,113
	Anthropogenic - Managed vegetation	317	<1 %	7	324
	Anthropogenic - Non Built or Bare	105	<1 %	< 1	105
	Unused forage or pasture	83	<1 %	16	99
	Unmaintained field crops	60	<1 %	-	60
AVAILABLE & WITH POTENTIAL FOR CULTIVATION		9,655	26 %	122	9,777
Unknown		199	<1 %	-	199
TOTAL		36,799	100 %	571	37,370
Not inventoried	Not inventoried	57,187			
	Excluded Crown parcels	28,972			
	Outside legal parcels	6,724			
SUBTOTAL		92,883			
TOTAL		129,682			

Table 4 shows that 19,459 ha or 53% 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; 17% has limited potential for cultivation; and 26% is available and has potential for cultivation.

Although 17% of the inventoried ALR was found to have limited potential for cultivation, some 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

Area of Interest (District of Vanderhoof, Electoral Area F)

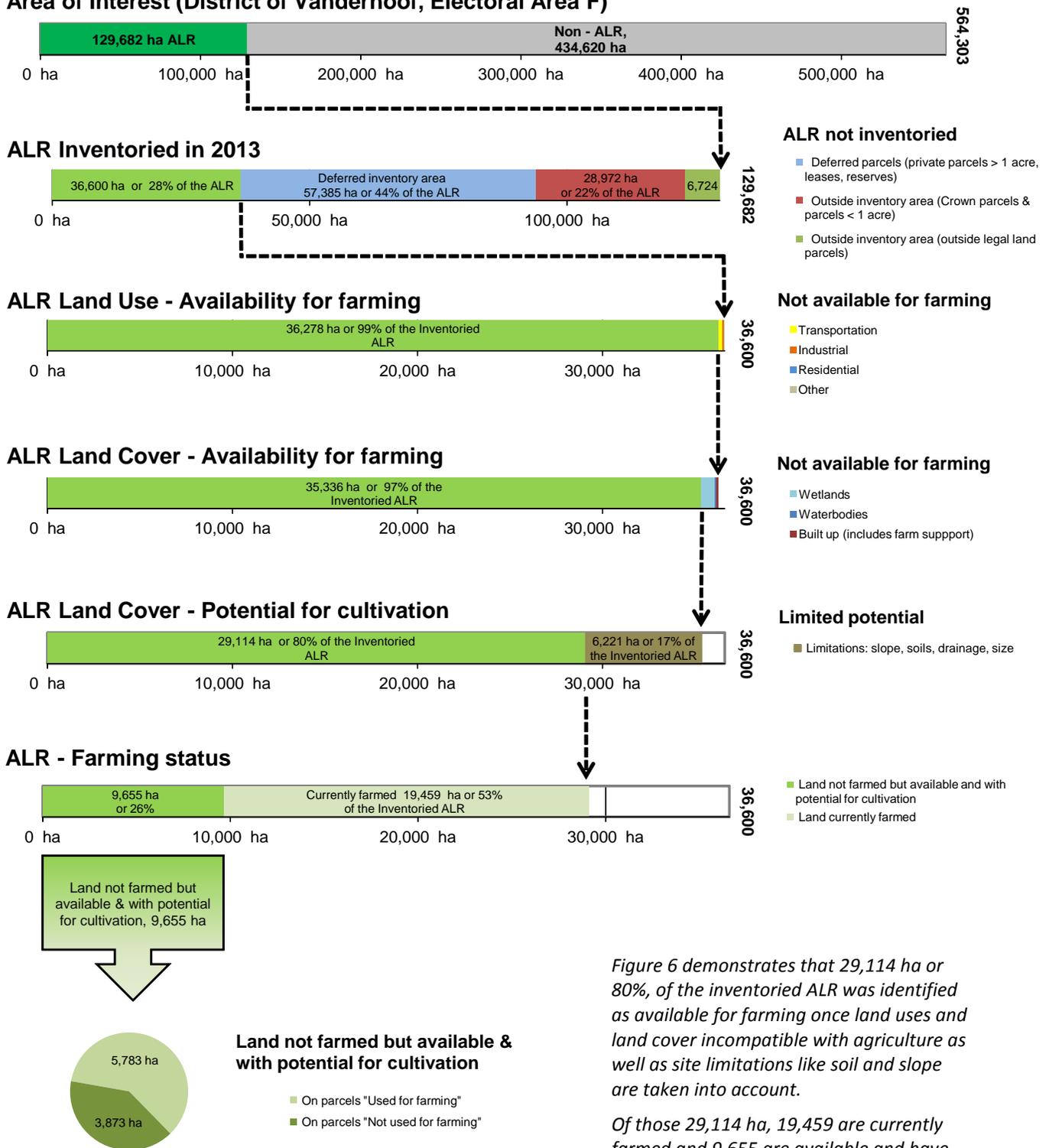


Figure 6 demonstrates that 29,114 ha or 80% of the inventoried ALR was identified as available for farming once land uses and land cover incompatible with agriculture as well as site limitations like soil and slope are taken into account.

Of those 29,114 ha, 19,459 are currently farmed and 9,655 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 “Used for Farming”

Table 5. Land use and cover on ALR 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 farming			Land currently farmed			% potential increase to total ALR farmed area
		In ALR (ha)	Outside ALR (ha)	Total area (ha)	In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Agriculture	120	2,421	9	2,430	4,890	58	4,948	12 %
Residential	237	2,886	21	2,907	7,942	61	8,003	15 %
Land in transition	7	235	< 1	235	349	< 1	349	1 %
Forestry	1	64	-	64	21	-	21	<1 %
Industrial	9	63	< 1	63	180	< 1	180	<1 %
Utilities	4	49	< 1	49	173	-	173	<1 %
Industrial - agriculture related	3	47	< 1	47	26	-	26	<1 %
Institutional & community	1	7	-	7	8	-	8	<1 %
Transportation - airport	1	7	-	7	88	< 1	88	<1 %
Transportation	1	4	-	4	-	-	-	<1 %
TOTAL	384	5,783	30	5,813	13,677	118	13,795	30 %

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”

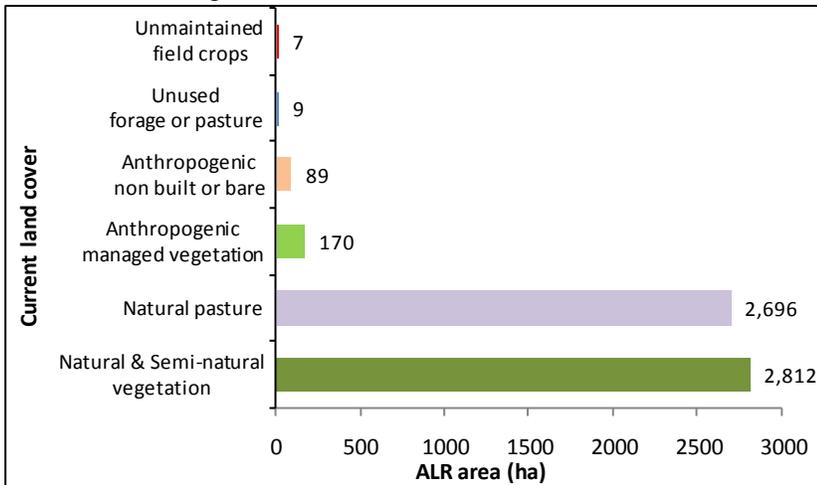


Figure 7 indicates that land in “Natural & Semi-natural vegetation” and “Natural pasture” would offer the greatest gains in cultivation on parcels that are already “Used for farming”.

These gains in farming may not be supported by residents who value privacy and viewsapes 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.

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

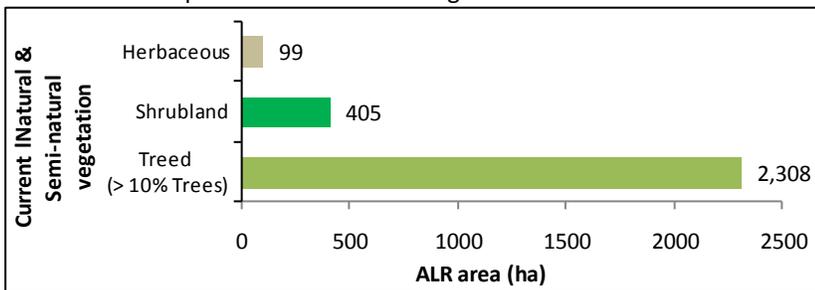


Figure 7 shows that trees comprise the majority of vegetation that would have to be cleared to bring “Natural & Semi-natural vegetation” into production on parcels that are already “Used for farming”.

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 farming			% potential increase to total ALR farmed area
			In ALR (ha)	Outside ALR (ha)	Total area (ha)	
Used for grazing	Used for grazing only	2	141	-	141	<1 %
	Residential	5	160	12	172	<1 %
	Forestry	1	34	-	34	<1 %
Not used for farming or grazing	Residential	196	1,548	23	1,571	8 %
	No apparent use	46	1,336	57	1,393	7 %
	Industrial	11	433	-	433	2 %
	Forestry	1	64	-	64	<1 %
	Recreation & leisure	4	54	< 1	54	<1 %
	Transportation - airport	1	52	< 1	52	<1 %
	Transportation	2	41	-	41	<1 %
	Land in transition	2	7	-	7	<1 %
Institutional & community	1	1	-	1	<1 %	
TOTAL		272	3,873	92	3,964	20 %

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

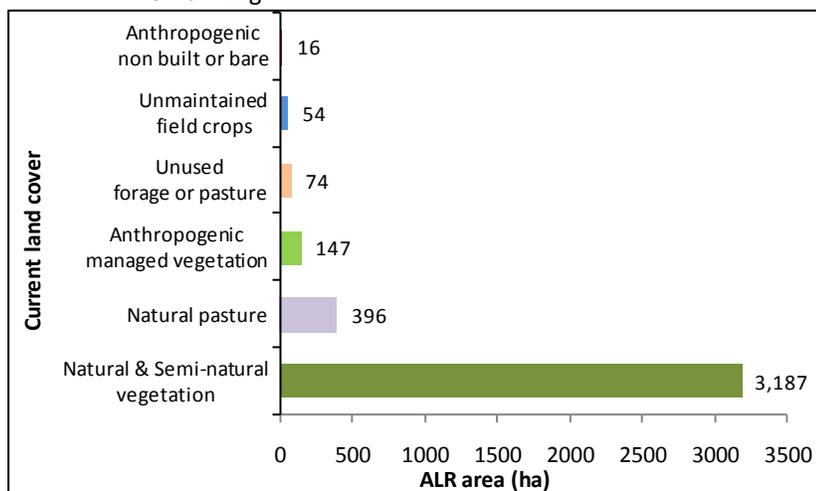


Figure 9 indicates that most of the available land on parcels “Not used for farming” is currently in “Natural & Semi-natural vegetation”.

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

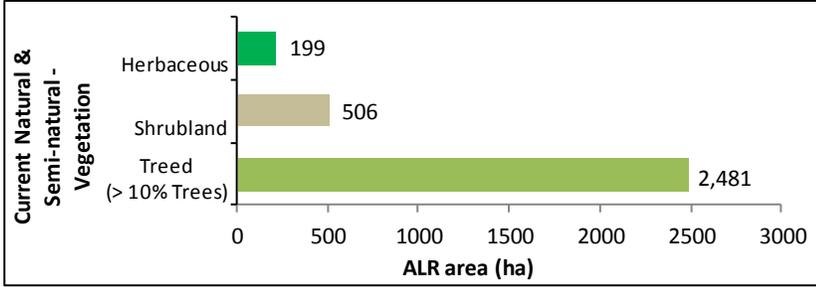


Figure 10 shows that trees comprise the majority of vegetation that would have to be cleared to bring “Natural & Semi-natural vegetation” into production on parcels that are “Not used for farming”.

Figure 11. Size of areas available for cultivation on ALR parcels “Not used for farming”

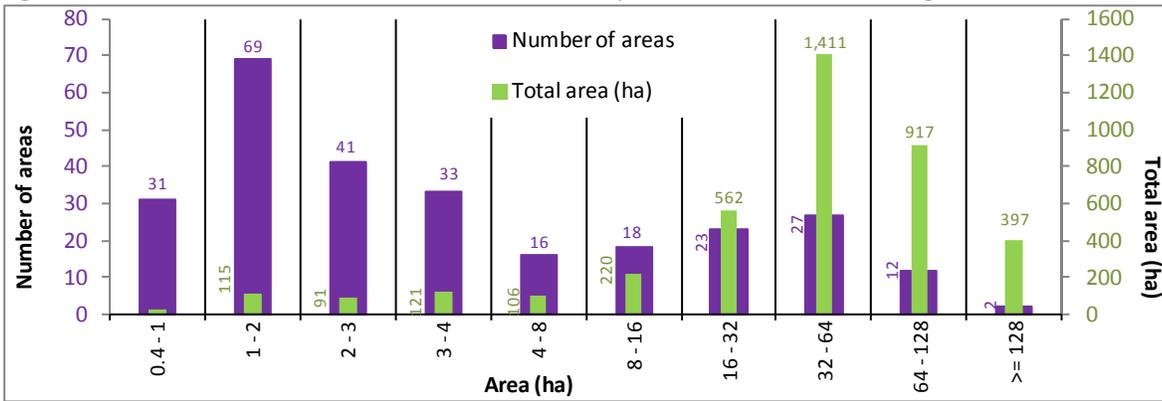


Figure 11 demonstrates that the majority of areas available for cultivation and without limitations are less than 2 ha in size (100 of 272 or 37%). Fewer options are available to efficiently farm small parcels. In general, areas should be at least 4 ha or more to provide the widest range of farming options.

There are 98 areas greater than 4 ha and available for cultivation. These areas have a total of 3,612 ha or 91% of the land available (refer to Table 6).

Figure 12. Parcel size distribution for ALR parcels “Not used for farming” with land available for cultivation

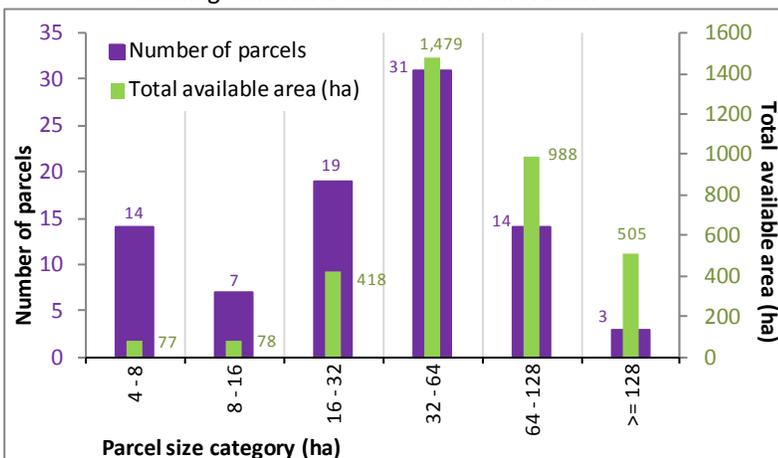


Figure 12 shows parcels currently “Not used for farming” with at least 50% of parcel area and at least 4 ha available for cultivation. In the inventoried ALR, there are 88 parcels with a total of 3,545 ha available that meet these criteria.

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 four crop groupings:

- **Forage & pasture:** grass, alfalfa
- **Cereals & oilseeds:** barley, oats, wheat, and canola
- **Cultivated land:** bare cultivated land (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
- **Sweet corn**

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	14,800	40%	74	14,874	76%	466
Cereals & oilseeds	4,179	11%	65	4,244	22%	116
Cultivated land*	340	< 1%	14	355	2%	25
Sweet corn	-	-	< 1	< 1	< 1%	1
TOTAL	19,319	52%	154	19,473	100%	608

* 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 seasons), 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 4 main field crop types produced on the 19,473 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 76% of all cultivated land and 40% of the inventoried ALR.

Cereals & oilseeds is the second most common type of cultivated crop accounting for 22% of all cultivated land and 11% of the ALR.

Refer to Map 4 for more information.

Figure 13. Main field crop types by percentage of cultivated land

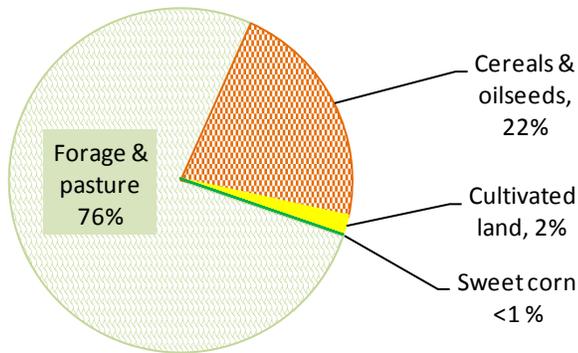


Figure 13 shows the proportion of main field crop types across all cultivated land in the inventory area.

Figure 14. All field crops by size

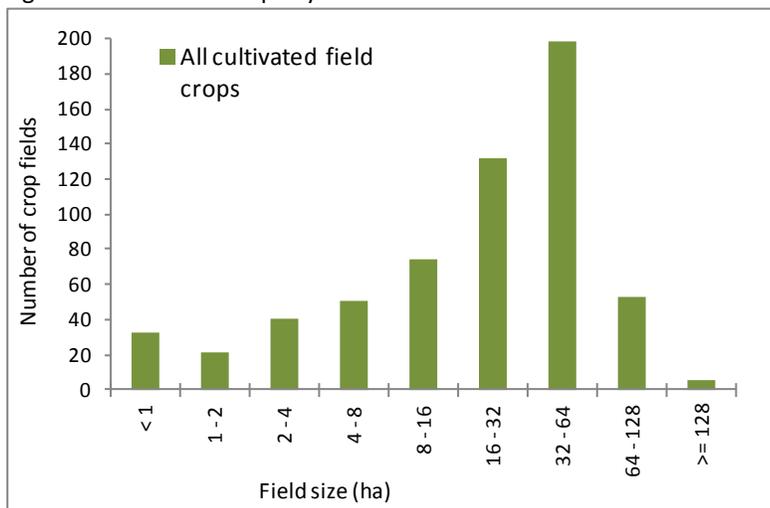


Figure 14 illustrates the number and size distribution of fields used for cultivated field crops.

In the inventory area, cultivated fields are most likely to be 32-64 ha in size.

There are 608 individual crop fields when grouped by main crop types. These fields have an average area of 32 ha and median area of 27 ha.

These fields occur on 524 parcels with an average size of 61 ha and a median size of 63 ha.

Figure 15. Forage & pasture and cereal & oilseed crops by size

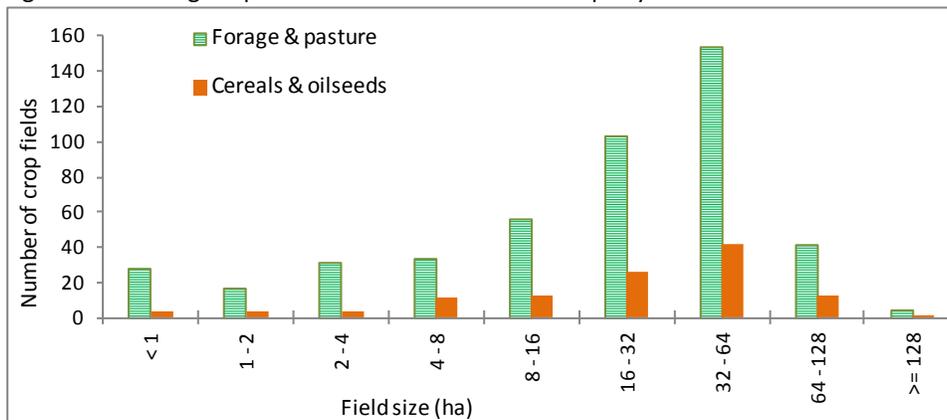


Figure 15 compares the top two main crop types by field sizes in the inventory area.

“Forage & pasture” and “Cereal & oilseed” 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

Small scale agriculture (< 500 sq m)		Number of activities	Average parcel size (ha)
Greenhouse	Very small scale	38	20
	Small scale	24	41
	Medium scale	6	44
	Large scale	1	62
Subtotal		69	
Mixed garden	Very small scale	5	45
	Small scale	2	45
	Medium scale	2	25
	Large scale	1	24
Subtotal		10	
Vegetable garden	Very small scale	29	16
	Small scale	20	22
	Medium scale	12	38
	Large scale	6	28
Subtotal		67	
TOTAL		146	

Table 8 details the 146 small agriculture activities identified in the inventory area.

These 146 activities occur on 97 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 (intensively managed):** Management includes weed control & fertilizer / manure applications. Often there is no fencing and crop growth is vigorous, even and thick.
- **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. Also used for grazing for 1 to 3 months per season. Fencing is in good condition and crop growth is reasonably even with few weeds. Usually associated with dairy operations.

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

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

Table 9. Forage & pasture crops by area

Forage and pasture crops		ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land
		In ALR (ha)	% of inventoried ALR area			
Forage (intensively managed) ^	Grass	39	< 1%	14	53	< 1%
Forage (intensively managed)	Alfalfa	185	< 1%	-	185	< 1%
Forage (intensively managed)	Mixed grass / legume	296	< 1%	< 1	296	2%
Forage (managed)	Grass	87	< 1%	-	87	< 1%
Forage (managed)	Alfalfa	752	2%	< 1	752	4%
Forage (managed)	Mixed grass / legume	4,550	12%	< 1	4,550	23%
Forage (unmanaged)	Grass	36	< 1%	-	36	< 1%
Forage (unmanaged)	Mixed grass / legume	615	2%	33	648	3%
Forage^	Grass	10	< 1%	-	10	< 1%
Forage^	Mixed grass / legume	384	1%	< 1	384	2%
Subtotal		6,954	19%	47	7,001	36%
Pasture (managed)	Grass	5	< 1%	-	5	< 1%
Pasture (managed)	Mixed grass / legume	421	1%	< 1	421	2%
Pasture (unmanaged)	Grass	187	< 1%	< 1	187	< 1%
Pasture (unmanaged)	Mixed grass / legume	770	2%	< 1	770	4%
Pasture^	Grass	837	2%	6	843	4%
Pasture^	Mixed grass / legume	1,363	4%	5	1,368	7%
Subtotal		3,583	10%	11	3,594	18%
Forage & pasture (managed)	Grass	115	< 1%	< 1	115	< 1%
Forage & pasture (managed)	Alfalfa	114	< 1%	< 1	114	< 1%
Forage & pasture (managed)	Mixed grass / legume	3,590	10%	< 1	3,590	18%
Subtotal		3,818	10%	< 1	3,819	20%
Forage or pasture unknown^	Unknown	277	< 1%	< 1	277	1%
Subtotal		277	< 1%	< 1	277	1%
Unused	Grass	34	< 1%	16	50	< 1%
Unused	Mixed grass / legume	72	< 1%	< 1	72	< 1%
Unmaintained / abandoned	Grass	19	< 1%	-	19	< 1%
Unmaintained / abandoned	Unknown	41	< 1%	-	41	< 1%
Subtotal		167	< 1%	16	183	< 1%
TOTAL		14,800	40%	74	14,874	76%

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

Table 9 shows that almost 7,000 ha of cultivated land is used for forage production. Mixed grass/legume is the main forage and pasture crop type. 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 16. Forage & pasture fields by size

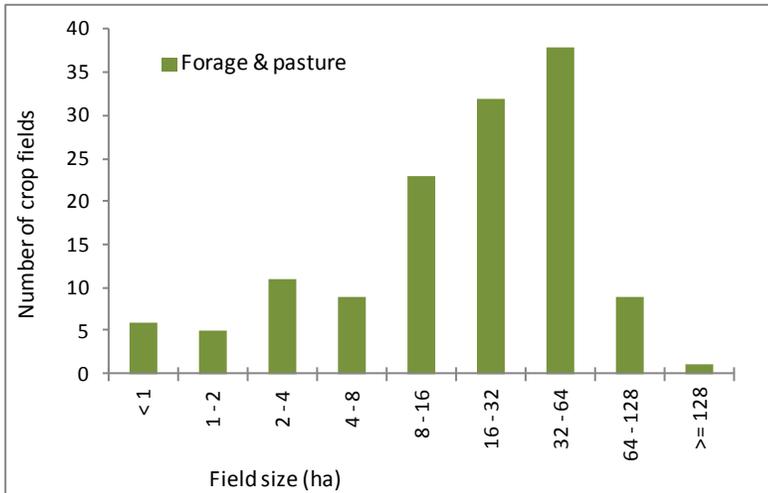


Figure 16 shows that “Forage & pasture” fields occur on a variety of field sizes in the inventory area, including fields less than 1 ha.

There are 622 individual “Forage & pasture” fields when separated by detailed crop type. These fields have an average area of 24 ha and median area of 17 ha.

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

Figure 17. Forage & pasture fields by size and type

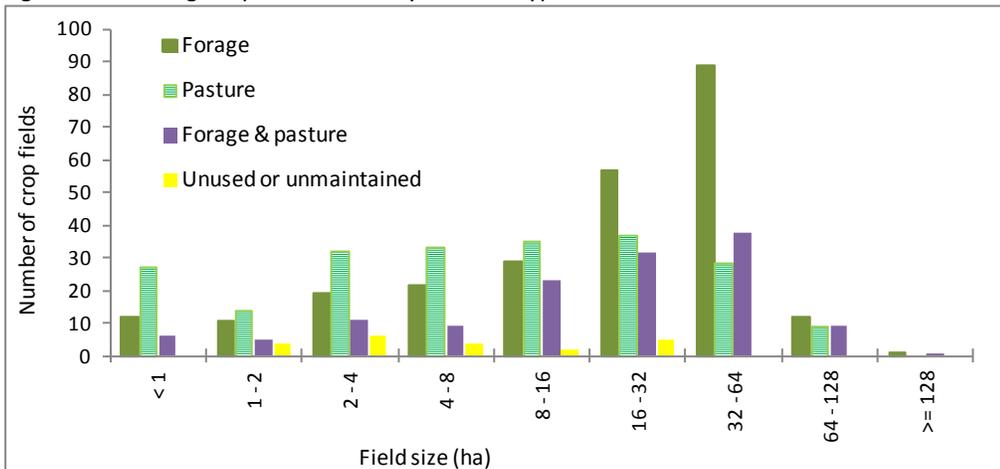


Figure 17 compares forage fields to pasture fields in the inventory area.

There are 252 forage fields with an average area of 29 ha, median area of 25 ha, and an average parcel size of 70 ha.

By comparison, there are 215 pasture fields with an average area of 17 ha, median area of 8 ha, and an average parcel size of 62 ha.

The most arable lands in the inventory area are used for forage as it is a high value crop when compared to livestock pasture. In fact, most large forage producers in the Vanderhoof area have no livestock. Much of the pasture land used by the beef producers is outside the survey area and thus not reported here.

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 no 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 & oilseeds by area

Grains	ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
	In ALR (ha)	% of inventoried ALR area				
Barley	2,198	6%	54	2,251	12%	70
Oats	1,222	3%	< 1	1,222	6%	56
Canola	640	2%	< 1	640	3%	18
Grain - Unknown	67	< 1%	-	67	< 1%	3
Wheat	53	< 1%	11	64	< 1%	5
TOTAL	4,179	11%	65	4,244	22%	

Table 10 shows that the inventory area has 4,244 ha in cereal & oilseed crops.

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.

* 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.

Figure 18. Cereal & oilseed fields by size

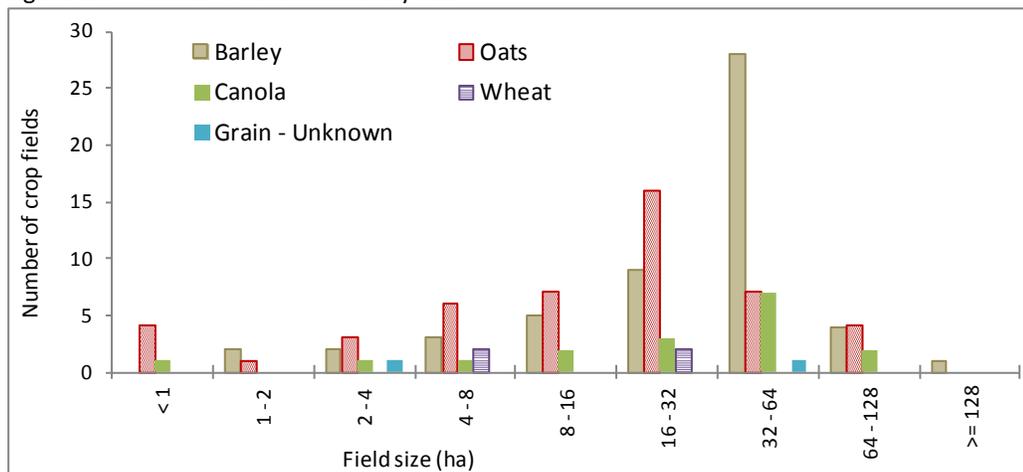


Figure 18 compares the different type of grain crops in the inventory area.

There are 54 barley fields with an average area of 42 ha, median area of 41 ha, and an average parcel size of 74 ha. There are 48 oat fields with an average area of 26 ha, median area of 17 ha, and an average parcel size of 66 ha. By comparison, there are 17 canola fields with an average area of 38 ha, median area of 37 ha, and an average parcel size of 63 ha.

In total, there are 125 grain fields with an average area of 34 ha and median area of 27 ha. These 125 fields occur on 116 parcels with an average size of 67 ha and a median size of 64 ha.

Individual Crops

Table 11. Individual crop types by area

Cultivated field crop	ALR		Outside ALR (ha)	Total area (ha)	% of inventoried cultivated land	* Number of crop fields
	In ALR (ha)	% of inventoried ALR area				
Forage (managed)	5,388	15%	< 1	5,389	28%	172
Forage & pasture (managed)	3,818	10%	< 1	3,819	20%	134
Barley	2,198	6%	54	2,251	12%	56
Pasture [^]	2,200	6%	11	2,211	11%	154
Oats	1,222	3%	< 1	1,222	6%	49
Pasture (unmanaged)	957	3%	< 1	957	5%	49
Forage (unmanaged)	651	2%	33	684	4%	41
Canola	640	2%	< 1	640	3%	17
Forage (intensively managed)	520	1%	14	534	3%	17
Pasture (managed)	426	1%	< 1	426	2%	18
Forage [^]	394	1%	< 1	394	2%	20
Forage or Pasture unknown	277	< 1%	< 1	277	1%	20
Cultivated land [~]	189	< 1%	4	193	< 1%	12
Crop transition	123	< 1%	11	133	< 1%	9
Unused forage/pasture	106	< 1%	16	123	< 1%	14
Grains, cereals, oilseeds	67	< 1%	-	67	< 1%	2
Wheat	53	< 1%	11	64	< 1%	4
Unmaintained forage/pasture	60	< 1%	-	60	< 1%	6
Fallow land [*]	28	< 1%	-	28	< 1%	4
Sweet corn	-	-	< 1	< 1	< 1%	1
TOTAL	19,319	52%	154	19,473	100%	

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

[~] Cultivated land is bare prepared land where the crop type is not yet apparent.

* 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)	Treed - open	1,834	5%	4	1,838	36%
	Treed - closed	1,759	5%	3	1,762	34%
	Herbaceous	1,030	3%	18	1,048	21%
	Shrubland	460	1%	< 1	460	9%
TOTAL		5,083	14%	25	5,108	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 36% of natural pasture is on areas with a land cover of Treed – open where 10% to 60% of crown cover is native trees and 34% is on areas with Treed – closed where 60% to 100% of crown cover is native trees.

Figure 19. Natural pasture areas by size

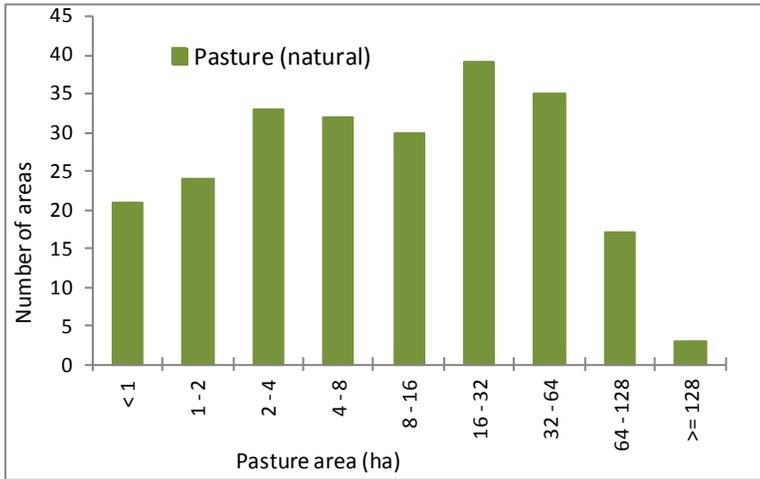


Figure 19 shows that natural pastures are most likely to be 16-32 ha in size.

There are 234 individual natural pastures with an average area of 22 ha and median area of 10 ha. The average size of parcels where natural pasture occurs is 62 ha.

GREENHOUSES & CROPS BARNs

Greenhouses are structures covered with translucent material and of sufficient size for a person to work inside¹¹. 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.

Table 13. Greenhouses by area¹²

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	Mixed bedding plants	0	0	0	1150	3	1	1
TOTAL		0	0	0	1150	3	1	1

Table 13 presents the one greenhouse operation reported in the inventory area. This operation has 3 poly greenhouses with 1,150 sq m of mixed bedding plants and is located outside the ALR. There are no glass greenhouses or crop barns reported in the inventory area.

Figure 20. Distribution of greenhouses by crop type

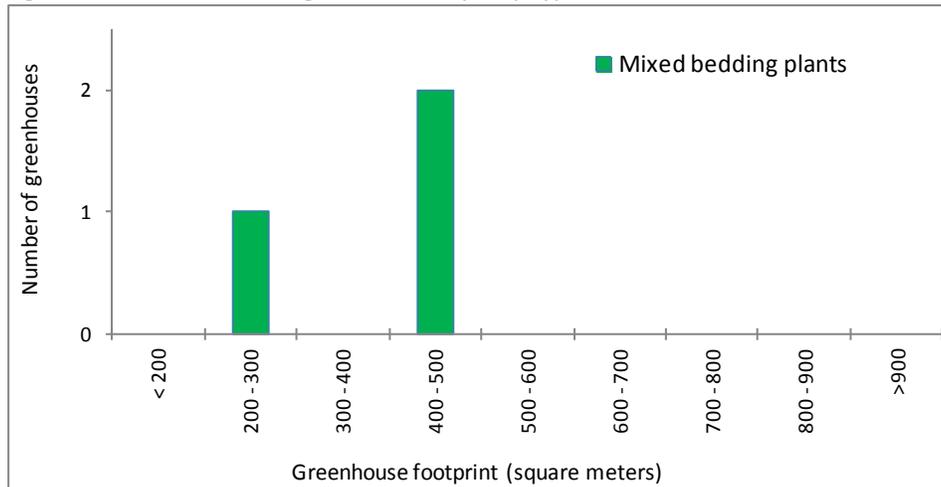


Figure 20 shows the size distribution of the footprint of the 3 poly greenhouses reported in the inventory area.

Refer to Map 4 for more information.

¹¹ Source: *Guide for Bylaw Development*, 2013 Issue by Ministry of Agriculture and Food.

http://www.agf.gov.bc.ca/resmgmt/publist/800Series/840000-1_Guide_for_Bylaw_Development_in_Farming_Areas-2013.pdf

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

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 crop area irrigated
	Sprinkler	Centre pivot	Landscape / turf		
Forage & pasture	756	-	18	774	5%
Cereals & oilseeds	470	457	< 1	928	22%
Cultivated land*	6	-	-	6	2%
Sweet corn	< 1	-	-	< 1	100%
TOTAL FIELD CROP AREA IRRIGATED	1,232	457	18	1,707	9%
Greenhouses	Flood and trickle irrigation			< 1	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.

Table 14 illustrates that only 5 % of all forage and pasture crops and 22% of all cereal & oilseeds crops are irrigated. In total, only 1,707 ha or 9% of cultivated crops were found to be irrigated.

Table 15. Individual crop types and irrigation

Cultivated field crop	Irrigation system in use (ha)			Total area irrigated (ha)	% of crop irrigated
	In ALR	% of inventoried ALR area	Outside ALR		
Forage (managed)	5,388	15%	< 1	205	4%
Forage & pasture (managed)	3,818	10%	< 1	91	2%
Barley	2,198	6%	54	697	31%
Pasture [^]	2,200	6%	11	14	< 1%
Oats	1,222	3%	< 1	62	5%
Pasture (unmanaged)	957	3%	< 1	2	< 1%
Forage (unmanaged)	651	2%	33	-	-
Canola	640	2%	< 1	141	22%
Forage (intensively managed)	520	1%	14	318	60%
Pasture (managed)	426	1%	< 1	47	11%
Forage [^]	394	1%	< 1	96	24%
Forage or Pasture unknown	277	< 1%	< 1	-	-
Cultivated land [~]	189	< 1%	4	-	-
Crop transition	123	< 1%	11	-	-
Unused forage/pasture	106	< 1%	16	-	-
Grains, cereals, oilseeds	67	< 1%	-	-	-
Wheat	53	< 1%	11	27	42%
Unmaintained forage/pasture	60	< 1%	-	-	-
Fallow land [*]	28	< 1%	-	6	20%
Sweet corn	-	-	< 1	< 1	100%
TOTAL	19,319	52%	154	1,707	

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

[~] Cultivated land is bare prepared land where the crop type is not yet apparent.

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

Table 15 outlines the type of irrigation systems used on the individual field crops in the inventory area.

Intensively managed forage is the most irrigated with 60% of crop area under sprinkler, followed by wheat with 42% of crop area under sprinkler and barley with 31% crop area under sprinkler or center pivot.

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 unit¹³. 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" 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).

¹³ Farm unit includes all the property belonging to a farm and may incorporate more than one parcel.

Table 16. Livestock activities

Livestock group	Livestock detail *	By parcel		Total activities	By activity type		By Location	
		Main type	Secondary type		Intensive	Non Intensive	Homesite	Non Homesite
Beef	Beef	91	2	93	2	91	60	33
	Beef (Dairy)	2	-	2	-	2	2	-
	Beef (Alpaca)	1	-	1	-	1	1	-
	Beef total	94	2	96	2	94	63	33
Dairy	Dairy total	1	2	3	1	2	3	-
Poultry	Chicken	4	7	11	2	9	11	-
	Turkey	1	-	1	-	1	1	-
	Poultry total	5	7	12	2	10	12	-
Swine	Swine total	1	5	6	-	6	6	-
Sheep / lamb / goat	Sheep / lamb	3	2	5	-	5	4	1
	Goat	1	3	4	-	4	4	-
	Sheep / lamb / goat total	4	5	9	-	9	8	1
Specialty	Bison total	1	-	1	-	1	1	-
Horse - meat	Horse - meat total	-	1	1	-	1	1	-
Equine	Horse & pony	63	11	74	-	74	67	7
	Mixed equine	6	1	7	-	7	6	1
	Equine total	69	12	81	-	81	73	8
TOTAL		175	34	209	5	204	167	42

"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.

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

Table 16 outlines the livestock identified in the inventoried area. Beef and equines are the most common types of livestock and are further described below. Although equine operations are the most common, the scale of each operation is generally much smaller than beef operations. See Figure 22 below.

All poultry activities are "very small" scale (< 100 birds) except for two intensive "small" scale activities; one layer and one pullet (each 100 – 2,500 birds).

All swine activities are "very small" scale (3 hogs) except for two "small" scale activities (4 – 75 hogs).

The one specialty livestock activity is a "small" scale bison farm (2 – 25 bison).

Table 17. Beef activities

Type of beef activity	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
Cow / calf	Very small scale (1 cow)	-	1	1	-	1	1	-
	Small scale (2 - 25 cattle)	12	-	12	-	12	9	3
	Medium scale (25 -100 cattle)	38	-	38	-	38	25	13
	Large scale (>100 cattle)	25	-	25	-	25	12	13
Back grounding	Small scale (2 - 25 cattle)	3	-	3	-	3	2	1
	Medium scale (25 -100 cattle)	4	-	4	1	3	4	-
	Large scale (>100 cattle)	1	-	1	-	1	1	-
Finishing	Very small scale (1 cow)	2	1	3	-	3	3	-
	Large scale (>100 cattle)	2	-	2	1	1	2	-
Unknown	Small scale (2 - 25 cattle)	1	-	1	-	1	1	-
	Medium scale (25 -100 cattle)	5	-	5	-	5	2	3
	Large scale (>100 cattle)	1	-	1	-	1	1	-
TOTAL	TOTAL	94	2	96	2	94	63	33

Table 17 details the 96 beef activities identified in the inventory area. Only 63 are located on “homesites” which indicates these 93 activities are associated with 63 separate beef operations.

Cow / calf is the raising of calves from birth to weaning (6 to 10 months). Rangelands are utilized extensively by the breeding herd (cow and calves), although some special breeding herds graze natural pasture and improved pastures areas. In the Vanderhoof area, most beef producers calve from January to April and wean in October or November. At weaning, calves are either moved to a back grounding operation or moved directly to a finishing operation.

Back grounding is the raising of calves over 6 months. Typically, calves are fed over the winter and then graze natural pasture and improved pasture areas the next summer. At 10 to 20 months, calves go to a finishing operation.

Finishing is where the yearlings are fattened for market, usually in a confined feeding environment such as a feedlot.

One cow / calf “small” scale operation and one unknown type “small” scale operation are both mixed beef and dairy herds. The one unknown type “large” scale operation is a mixed beef and alpaca herd.

Table 18. Dairy activities

Type of dairy activity	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
Milking	Very small scale (1 cow)	-	2	2	-	2	2	-
	Large scale (>100 cattle)	1	-	1	1	-	1	-
TOTAL	TOTAL	1	2	3	1	2	3	-

Table 18 details the 3 dairy activities identified in the inventory area. Only 1 of the 3 activities is a significant commercial operation. This operator also has a “large” scale beef cow / calf operation and a “large” scale beef finishing operation located on different homesites than the dairy.

In addition to the 3 dairy activities, there are two “small” scale mixed herd operations (beef and dairy cattle) which are reported in Table 17 above.

Table 19. 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)	-	2	2	-	2	2	-
Goat - Small scale (5 - 125 goats)	1	1	2	-	2	2	-
Sheep / lamb - Very small scale (10 sheep)	2	1	3	-	3	3	-
Sheep / lamb - Small scale (10 - 250 sheep)	1	1	2	-	2	1	1
TOTAL	4	5	9	-	9	8	1

Table 19 details the 9 sheep / lamb/ goat activities identified in the inventory area. Only 8 of the 9 activities are located on “homesites” which indicates these 9 activities are associated with 8 separate sheep / lamb/ goat operations.

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

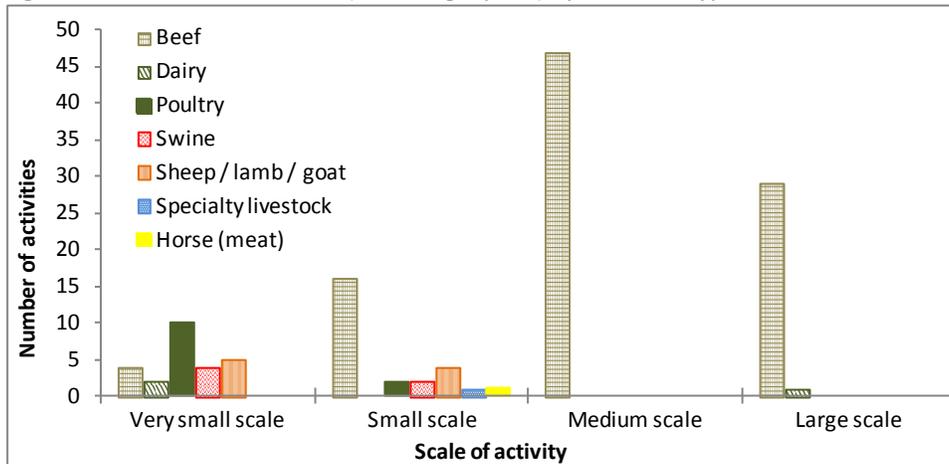


Figure 21 illustrates the scale of all livestock activities (excluding equine) in the inventory area.

Most (4 of 6) swine activities are “very small” scale (3 hogs) with only two “small” scale (4 – 75 hogs).

The one specialty livestock activity is a “small” scale bison farm (2 – 25 bison).

All poultry activities are “very small” scale (< 100 birds) except for two intensive “small” scale activities; one layer and one pullet (each 100 – 2500 birds).

All “medium” or “large” scale activities are beef except for one dairy.

Figure 22. Livestock and equine activities by scale

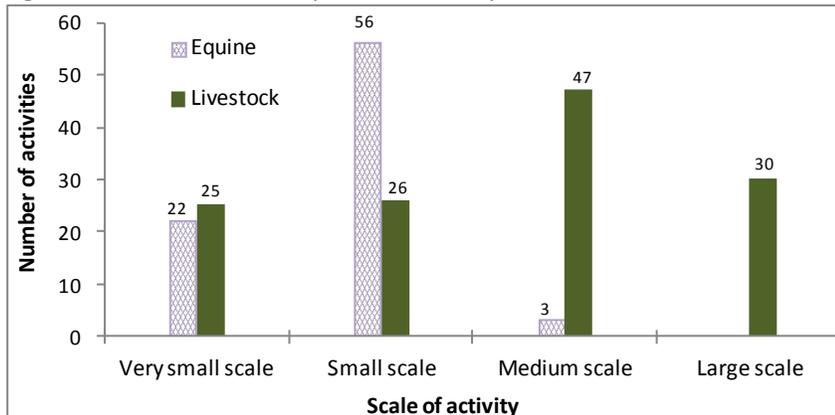


Figure 22 compares the scale of livestock and equine activities.

Even though 73 of the 167 livestock homesites are equine, most are “small” or “very small” scale. There are 30 “large” scale livestock activities, while there are no “large” scale equine activities.

Figure 23. Livestock activities (excluding equine) by parcel size and scale

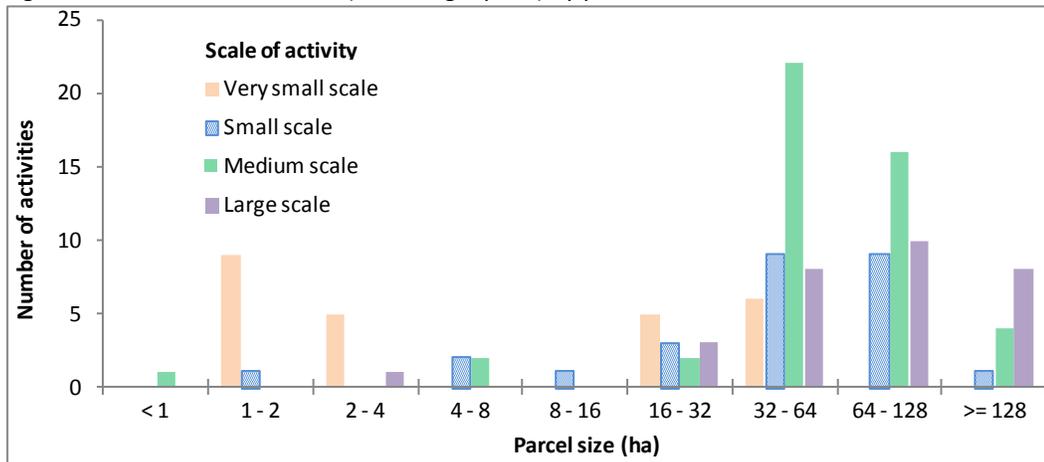


Figure 23 illustrates the distribution of livestock activities (excluding equine) by scale across parcel size categories.

“Very small” and “small” scale livestock operations occur on nearly all parcel sizes.

Most “large” scale livestock activities occur on parcels greater than 32 ha.

Figure 24. Beef activities by parcel size and scale

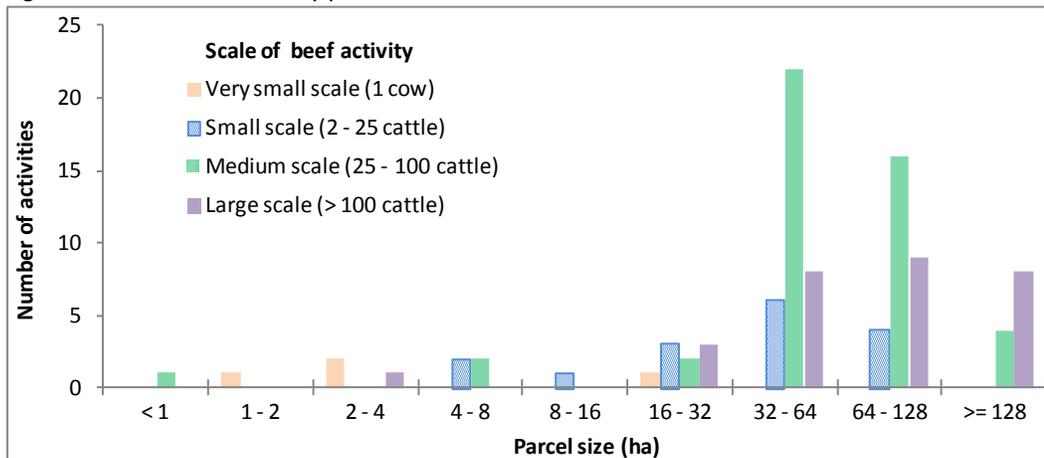


Figure 24 illustrates the distribution of beef activities by scale across parcel size categories.

Beef occurs on all parcel sizes, but most “large” scale beef occur on parcels greater than 32 ha.

Figure 25. Livestock activities (excluding equines) by parcel size and type

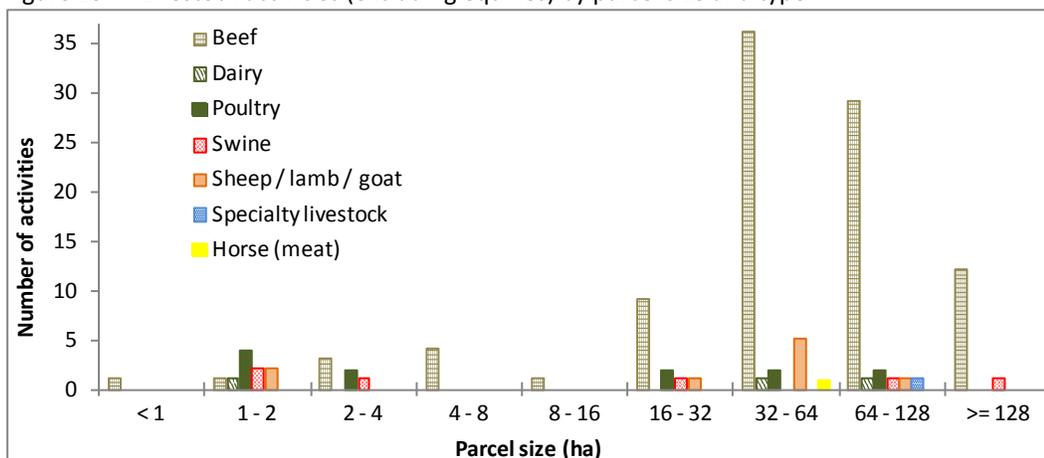


Figure 25 compares the distribution of different livestock types across parcel size categories.

The one specialty livestock activity “small” scale bison farm (2 – 25 bison) is on a 64-128 ha parcel.

Figure 26. Livestock and equine activities by parcel size

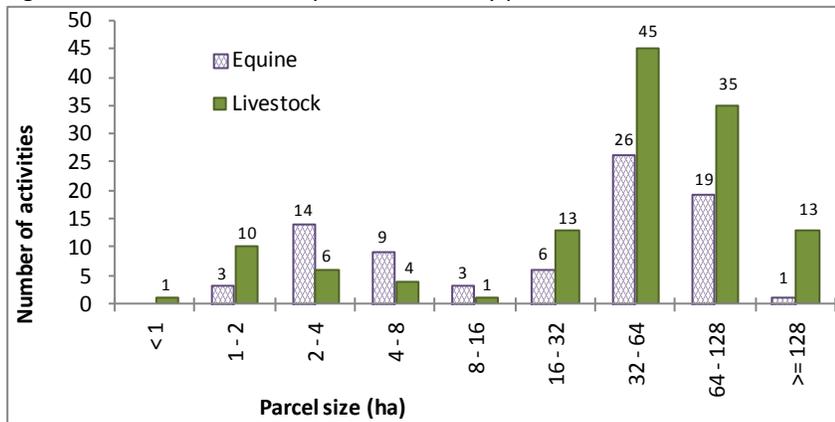


Figure 26 compares the distribution of equine and livestock activities across parcel size categories.

Parcels less than 16 ha are more likely to have equine activities while parcels greater than 16 ha are more likely to have livestock activities.

Figure 27. Average area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

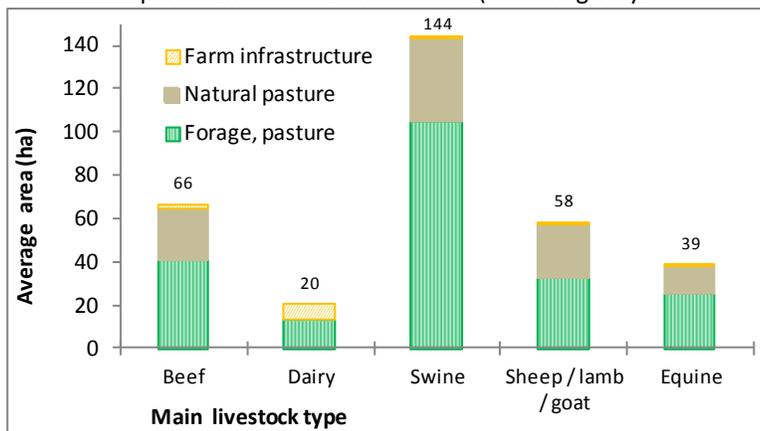


Figure 27 shows that, on average, a beef activity is associated with 40 ha of forage & pasture, 24 ha of natural pasture, and about 1.8 ha of farm infrastructure.

Comparatively, on average, a beef activity utilizes more forage & pasture than an 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 28. Total area in forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

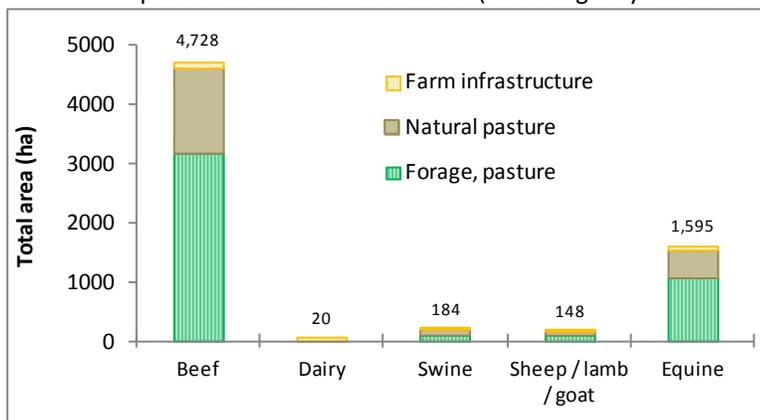


Figure 28 shows that beef activities use a much greater total area than any other livestock activity.

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

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

Figure 29. Percent of parcel area utilized for forage & pasture and farm infrastructure on parcels with livestock activities (excluding very small scale)

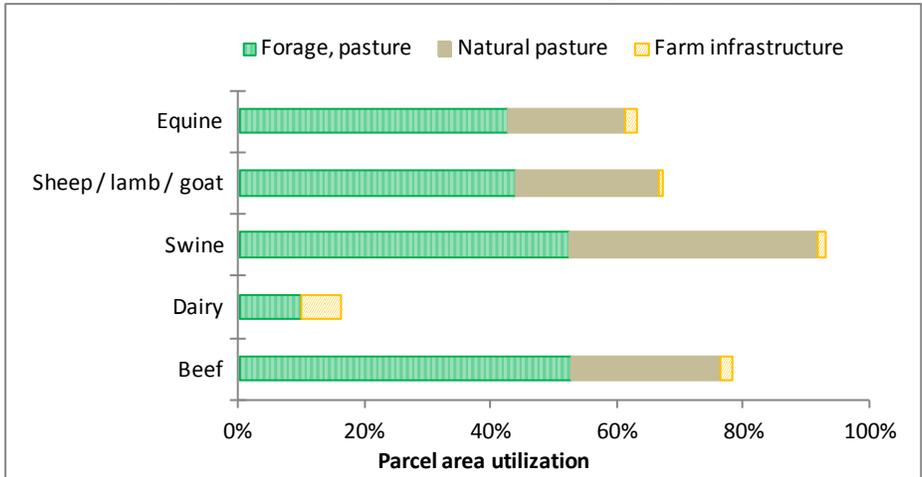
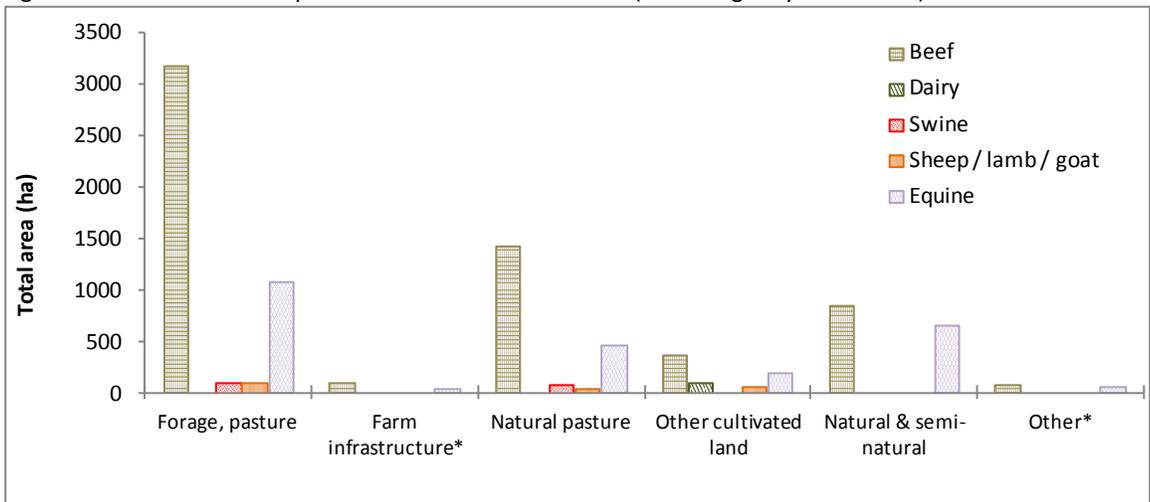


Figure 29 shows that on average, beef activities utilize just under 80% of parcel area for forage & pasture, natural pasture, and farm infrastructure.

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

Figure 30. 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 30 shows that beef 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 farm¹⁴ or the activity is considered non-agricultural. In many cases, local knowledge in combination with the field survey is used to determine if an activity meets the criteria to be considered on-farm value-added. The three main categories of value-added are: processing, direct sales, and agri-tourism.

Processing is an activity that maintains, 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.

There was no on farm value-added activities identified during the windshield survey, however there are 2 abattoirs and 2 hay compression operations in the Vanderhoof area which support the local agriculture industry. These operations are considered Industrial – agriculture related as they do not meet the definition of on farm value-added since less than 50% of the commodity utilized is produced on the same farm as the operation. For instance, the two hay compression operations purchase alfalfa and Timothy hay to compress and export to Eastern Asia and the Middle East for various livestock consumption. The two abattoirs offer custom slaughter services to local farmers, one specializing in poultry and rabbits and the other in red meat.

¹⁴ 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 parcelization of ALR land in the area of interest, only legal land 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, 1,940 parcels with a total of 92,732 ha of ALR meet the above criteria and are included in this section of the report. This includes 5 parcels that have less than 50% of their area in the ALR but contain greater than 10 ha of ALR land. Although Indian reserves Stony Creek 1, Old Country Meadow 4, Noonla 6, Laketown 3, Sackanitecla 2, and Clustalach 5 all have at least half of their land area in the ALR, they are not included in this section of the report.

Of these 1,940 parcels, only 873 parcels or 36,784 ha of ALR were inventoried for land use and land cover in 2013.

Figure 31. Parcel inclusion in the ALR



Figure 31 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:

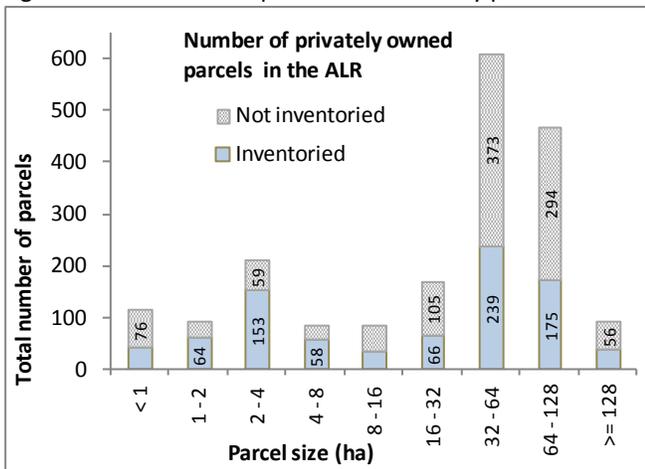
- lot C has less than 50% of its area and less than 10 ha in the ALR
- lot D is completely outside the ALR.

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 unit¹⁵, 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 32. Number of parcels in the ALR by parcel size



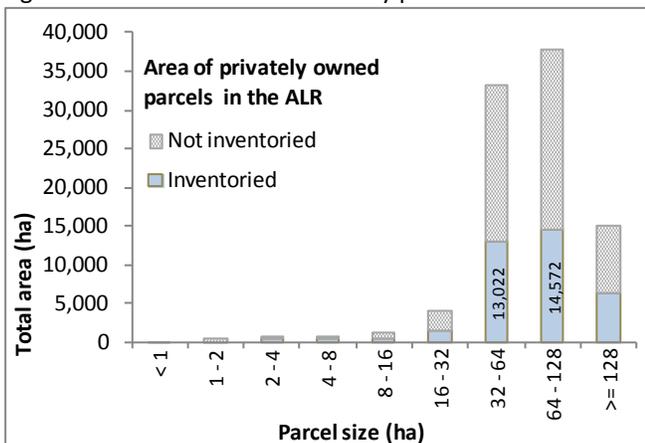
Of all private owned ALR parcels, 6% are less than one ha. The average ALR parcel size is 48 ha.

Figure 32 illustrates that of the 1,875 parcels in the ALR:

- 6% (118 parcels) are less than 1 ha.
- 22% (422 parcels) are less than 4 ha.
- 4% (85 parcels) are between 4 ha and 8 ha.
- 4% (86 parcels) are between 8 ha and 16 ha.
- 70% (1347 parcels) are greater than 16 ha.

Only 873 of the 1,875 ALR parcels were inventoried for land use and land cover in 2013.

Figure 33. Total area in the ALR by parcel size



In the Vanderhoof area, most of the private owned ALR is on larger parcels.

Figure 33 illustrates that of the 92,732 ha of ALR land on ALR parcels:

- <0.1% (48 ha) is on parcels less than 1 ha.
- <1% (802 ha) is on parcels less than 4 ha.
- <1% (459 ha) is on parcels between 4 ha and 8 ha.
- 1% (1,068 ha) is on parcels between 8 ha and 16 ha.
- 97% (90,404 ha) is on parcels greater than 16 ha.

Only 36,784 of the 92,732 ha of ALR were inventoried for land use and land cover.

¹⁵Farm 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	491	25 %	56 %
Used for grazing	9	<1	1 %
Not used for farming or grazing	373	19 %	43 %
Not inventoried	1,067	55 %	-
TOTAL	1,940	100 %	100 %

Table 20 demonstrates that of the 1,940 private owned parcels in the ALR, 491 or 25% are reported to be "Used for farming".

Of the 1,067 parcels not inventoried, only 65 are less than one acre.

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

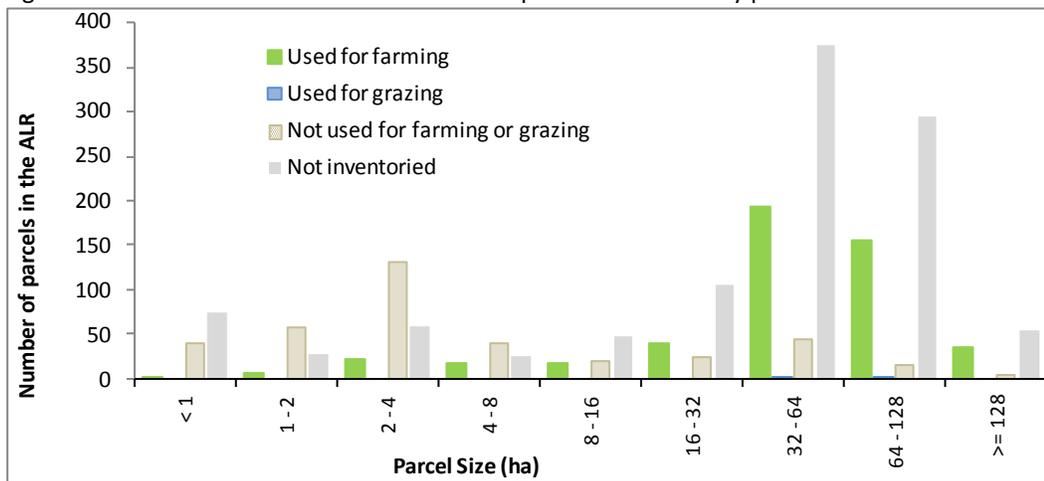


Figure 34 compares the distribution of "Used for farming" parcels with other parcels in the ALR.

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

Small parcels are less likely to be farmed.

Figure 35. Number of farmed and not farmed parcels in the ALR by parcel size (line chart)

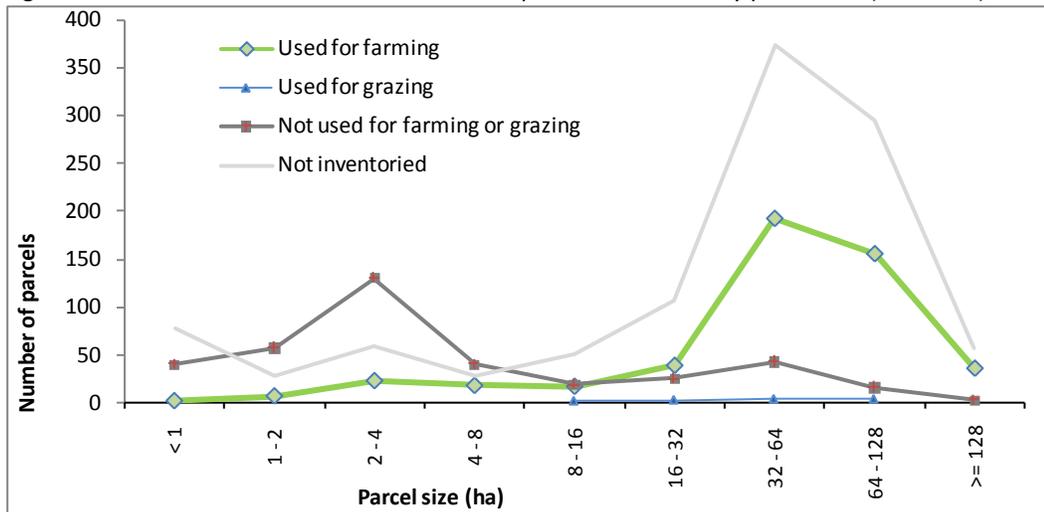


Figure 35 illustrates that although parcels of all sizes are "Used for farming"; parcels less than 8 ha are less likely to be farmed.

Figure 36. Proportion of parcels farmed and not farmed by parcel size in the ALR

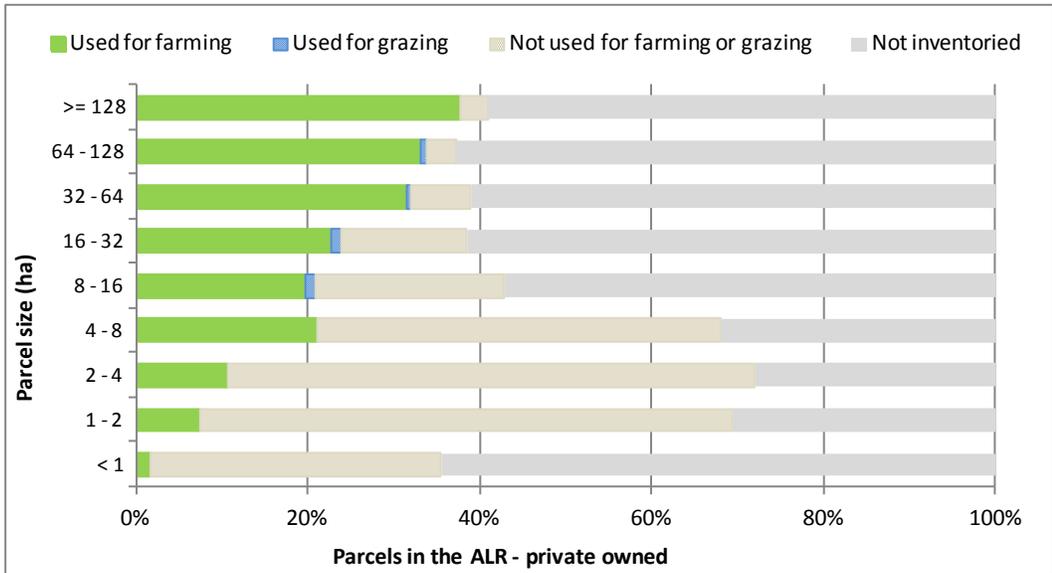
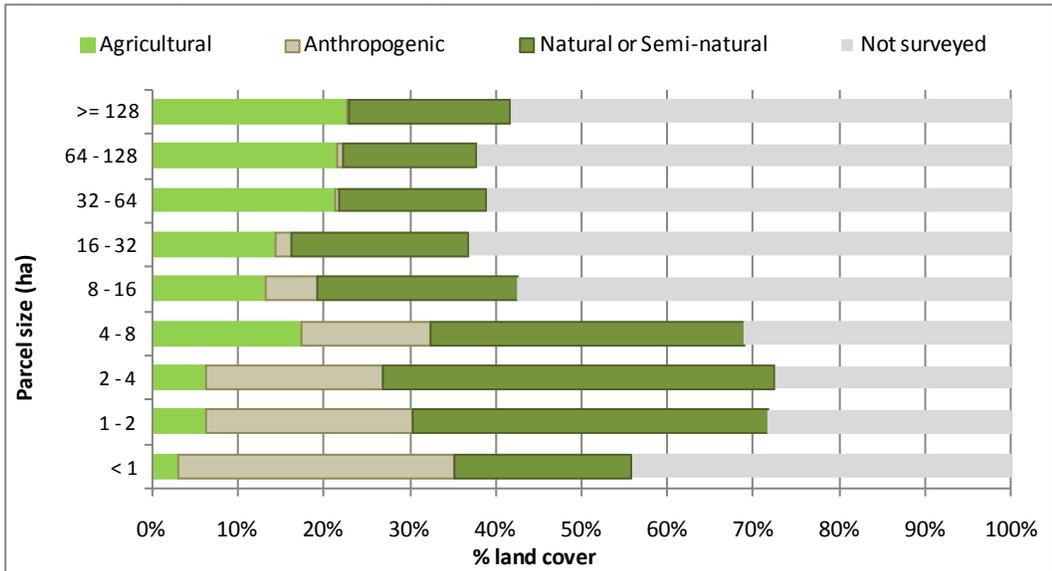


Figure 36 shows that the proportion of parcels "Used for farming" generally increases as the parcel size increases.

Figure 37. Proportion of land cover by parcel size on parcels in the ALR



Similar to Figure 36 above, Figure 37 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_34x44LS.pdf
Map 2.	Land use & farm use	Map2_LandUse_34x44LS.pdf
Map 3.	Availability of land for farming	Map3_Availability_34x44LS.pdf
Map 4.	Farming activities	Map4_FarmAct_34x44LS.pdf
Map 5.	Condition of ALR lands	Map5_CondALR_34x44LS.pdf

Digital format : pdf

Size: 34" x 44" landscape