

**AGRICULTURAL LAND PRESERVATION AND URBAN DEVELOPMENT IN THE NEW
FRINGE: A Case Study of Small Lot Farming
in Kelowna, British Columbia**

by

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A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE COLLEGE OF GRADUATE STUDIES

(Interdisciplinary Studies)

THE UNIVERSITY OF BRITISH COLUMBIA
(Okanagan)

August, 2017

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Committee Approval

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AGRICULTURAL LAND PRESERVATION AND URBAN DEVELOPMENT IN THE NEW
FRINGE: A Case Study of Small Lot Farming
in Kelowna, British Columbia

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Abstract

In 1973, the Province of British Columbia enacted the Agricultural Land Commission Act (ALC) implementing the Agricultural Land Reserve (ALR) to curb consumption of agricultural land by urban encroachment. The Central Okanagan was one of the main areas in the province where agriculture lands warranted protection. Today, the conflict between urbanization and agriculture is still simmering especially in Kelowna where 40% of the city's land base is within the ALR. The objective of this thesis is to understand the impact of the ALR on the inner fringe where urban and agricultural uses vie for the same land base. Four research questions are posed to understand the implications of agricultural land preservation within a Kelowna: (i) Is agricultural land preservation working in the inner fringe; (ii) Is urban sprawl being avoided; (iii) Is farming being advanced in the inner fringe; and (iv) Can small lot farming play a role to help advance farming in the inner fringe? The mixed methods case study approach employs a combination of qualitative methods, including personal interviews with city planners, developers and farmers; and empirical methods including a spatial analysis of two ALR study blocks that are under pressure of urbanization. The research results suggest that land sales speculation in the inner fringe ALR continues to undermine agricultural land preservation goals. The ALR has helped avoid urbanization of inner fringe agricultural lands, however, suburban, low density residential neighbourhoods continue to grow as a result of leapfrog development, market demand, and municipal policy for low density development. Although inner fringe agricultural land is being preserved, speculative interest has had a negative effect on farming, especially in the study block adjacent to the City Core Area. Small lot farming could have a role in urban agriculture, however, the continuing concern about fragmentation impedes expansion of this industry sector. Other means to promote farming is required. More definitive agricultural land use and community planning are suggested to protect agricultural land, enhance farming and mitigate urban sprawl. Five recommendations are provided for cities to embrace agriculture not only for food security, but also to invent new urban forms.

Preface

This thesis was researched and prepared by Edward Grifone. I have practiced as a professional urban planner in the Okanagan for 25 years. The precedent for the topic was derived from this experience. It is also a result of trying to understand the dynamic of how restrictive zoning such as the ALR relates to a growing urban centre, since 1976 when I worked as a summer student at the Agricultural Land Commission.

The research included interviews with three groups of informants: city planners, farmers/landowners in the ALR, and developers. As such, approval from the UBC Research Ethics Board was required and was obtained, November 24, 2016 (ID #H15-01939).

The initial phases of this thesis served as background to presentations made at the Canadian Association of Geographers Annual Conference in Vancouver (June, 2015), and to the Central Okanagan Food Council (Field to Fork) Research Meeting in Kelowna (April, 2016). Otherwise, this thesis or parts thereof, have not been published in advance of this submission.

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Acknowledgements

I offer my gratitude to Dr. Donna Senese (UBCO), principal advisor and supporter for the topic I wanted to pursue from the beginning of my graduate work. Her suggestions to create something special or “new” resonated with me and carried me through many months of investigation and writing. Her words of encouragement and advice from week to week and month to month lifted my spirits, allowing me to move smoothly through the steps and ultimately the sections and edits.

A sincere thank you must also go out to Dr. David Connell (UNBC), who introduced me to the concept of ‘small lot’ farming and who provided financial assistance for me to pursue the topic in more detail. His help with sourcing the literature was a significant contribution for the development of my thesis. The small lot farming topic in BC is important enough to demand more research and dialogue.

To Professor Bernard Momer (UBCO), I extend my thanks for directing me to apply my planning background and perspective. The issue of leapfrog development related to urban sprawl was an important realization when studying agricultural land preservation within a growing city. My eyes were opened to the many different degrees of sprawl when preparing a directed studies paper for Professor Momer.

Lastly, thanks go out to my wife of almost 40 years. Susan’s support from the day I announced I wanted to go back to graduate school was always present. Her contributions included rebounding ideas, offering word choices, and final draft formatting. Most importantly, her belief in my ability to succeed has been unwavering.

Dedication

I dedicate this thesis to the people that have contributed to my understanding of farming and urban form:

- Herb Luttmerding, P.Ag (1938-2014) A dedicated pedologist and one of the earliest Soils Specialists in Canada, Herb was instrumental in setting the System for Soil Classification (CLI). During many of my visits to soil test pits with Herb, he taught me that agriculture starts underground.
- Gary Runka, P, Ag, MSc (1938-2013) A specialist in natural resource management and soil science, Gary was one of the earliest General Managers and then Chairman of the Provincial Agricultural Land Commission. I had the privilege of working with him in government and in private consulting sector. His life work has affected many corners of BC.
- My many mentors in the early days of my planning and urban design career: Eugene Lee, Carmen Biafore, Lyall Armstrong and Arthur Muscovitch.
- The farmers, developers and my fellow planners that are all working hard to create a liveable Kelowna.

1. Introduction: Problem Statement, Research Questions and Study Area

1.1 Problem Statement

The relationship between urbanization and agricultural land preservation in Canada has been a focus of attention amongst scholars of urban and rural geography and practicing planners in local government for several decades. During the late 1950s and early 1960s, academics such as Russwurm and Krueger wrote about the loss of food-producing lands in Eastern Canada, especially where fruit lands in Ontario were under threat from urban encroachment and fragmentation of farms (Krueger, 1959; Russwurm, 1961). Local government planning departments imposed their own programs of farmland preservation, but the relentless forces of urbanization were too great to curb the continued consumption of the agricultural land (Wagner, 2005). Led by BC in the early 1970s, provincial agricultural land preservation legislation had also been enacted in three other provinces, Ontario, Quebec and Newfoundland, by the end of the decade. Nova Scotia introduced their legislation in the late 1990s. The battlegrounds between urbanization and the rural landscapes have continued to occur in cities' rural-urban fringes (Pryor, 1968). It is in these fringes where the evolving pattern of land uses and urban spatial expansion have raised concern about agricultural land loss as well as leapfrog development, land use disorder and urban sprawl. The disorder is often attributed to interruption of farming by non-compatible land uses or urban activities. By the late 1990s, there was significant focus on government initiatives that promoted compact urban development and residential densification policies to mitigate or halt urban sprawl throughout North America (Filion, 2003; Wagner, 2005).

Today, there is still concern about the impact of urbanization and sprawl on agricultural land, the natural environment and on the sustainability of cities. In British Columbia (BC), the Agricultural Land Reserve (ALR) has been very effective in slowing the loss of high quality agricultural land (Smith, 2012). However, agricultural land preservation within the inner fringes of cities has challenged the planning of urban land use patterns. This dissertation explores the effect of agricultural land preservation on urban sprawl by turning the table on perspectives of prevailing research. The research in this study uses the early principles of agricultural and rural community preservation as a foundation, but then goes further to specifically question the impacts of inner-city agricultural land preservation (the ALR) on urban sprawl, in the form of leapfrogging, in cities such as Kelowna, BC. There is a vast base of knowledge regarding the methods and tools that address farmland preservation in North America. Substantial strides have been made in the effectiveness of preservation programs since the early 1960s (Beesley, 2010; Bryant and Russwurm, 1982; Krueger, 1982). For example, provincial programs such as the ALR in BC have helped curb the loss of agricultural land from 6,000 hectares (ha.) per year just prior to the introduction of the legislation to 600 ha. annually nearly 35 years later (Campbell, 2006). The literature also abounds with information on urban sprawl and how it has become one of the main problems of contemporary cities that new urbanists wish to combat with smart growth principles (Filion, 2003). Similarly, densification, creating more compact, transit-oriented and walking-friendly communities is a planning concept now widely accepted amongst planning practitioners and smart growth advocates. In the meantime, the constant growth of the suburbs around many North American cities is proof that smart growth and other planning principles and policy directions are not

successful in altering prevailing forms of urbanization (Filion, 2003; Monroe and McDonnell, 2008).

There is little recent literature on the relationship between agricultural land preservation and urban sprawl in the inner fringes of cities. In this thesis, I ask whether agricultural land preservation has caused urban sprawl and conversely, could the benefit of developing some agricultural land in the inner fringe outweigh the cost or negative impacts of sprawl? These questions relate directly to the issues of agricultural land use protection and its effect on urban land use more generally. In order to address these questions, both empirical and qualitative research methods are used to examine residential density gains; the variation of land uses, transportation implications, and the impacts of urban sprawl or suburban developments more generally. In depth, qualitative data represents the opinions of urban planning practitioners responsible for the preparation and implementation of planning policies at the local level; of developers that represent market reality of suburban development; and of owners of farmland in the inner fringe. Conklin and Leshner (1977) refer to these as lands in close proximity to urban uses as those that have premature expectations for development but excessive agricultural disinvestment. It is the objective of this research to investigate whether these are the lands that may be causing urban sprawl via 'leapfrogging' as they sit in waiting for a future urban use.

The Kelowna case is a prime example where urbanization has been a strong force and continues to erode much of the agricultural land base. Although the Provincial Agricultural Land Commission Act (ALC Act), and the attendant Agricultural Land Reserve (ALR), is considered powerful legislation to protect the agricultural land base, there is concern that current policies and regulations have also resulted in considerable speculation in the sale

of inner city agricultural land, land use disorder and leapfrog development. Large quantities of farmland in the inner fringe sit idle or are under-farmed. In general, the overall pattern of development in Kelowna has been affected due to this attempt to respect the presence of the agricultural base.

Based on these long-term land use trends and gaps in the literature, this thesis seeks to better understand the relationship between the restrictive zoning of agricultural lands and urban development in Kelowna, BC. To this end, I will answer the following research questions:

1. Is agricultural land preservation working in the inner fringe?
2. Is urban sprawl being avoided?
3. Is farming being advanced in the inner fringe?
4. Can small lot farming play a role to help advance farming in the inner fringe?

This study involves researching the professional opinions of a group of participants in the municipal planning field, land development industry and the farming community. The research questions informed the topics discussed with the study informants and attempts to understand the dynamics of the problem in the inner fringe.

1.2 The Research Questions

The following is an overview and background to the questions posed above.

1.2.1 Is Agricultural Land Preservation working in the inner fringe?

To address the problem noted above, we must first consider if the agricultural land in the inner fringe of Kelowna is being protected with the legislative and policy framework that is in place. This question is important, as it will highlight how local political interests and senior government policy often disagree as to the use of agricultural land. Newman et al (2015) believe that this is largely due to land use planning and land development

controls that are within the local political scope of influence. Other factors to contend with are the speculative forces that are contrasted against the farmer's complaint regarding the poor economic feasibility of farming in the inner city. It is suggested that this dynamic is due to the influence of urban uses being located immediately adjacent to the farmland. These and other factors such as the expense of farming, high land values and prevailing markets have given rise to the question of whether the agricultural lands in the inner fringe should be protected for the short term or the longer term.

1.2.2 Is urban sprawl being avoided?

It is important to understand how sprawl, leapfrogging and fragmentation of the land base are inextricably linked when it comes to the consequences of urban encroachment on the countryside. This appreciation is especially relevant because the near-urban areas contain most of the Class 1-3 soils in Canada. (Caldwell et al, 2012; Cathcart, 2013; Hoffman 2001, 2005; Miller, 2013; Resource Planning Group, 2002). It is further argued by many researchers that the sprawl, in the form of low density residential patterns of rural development, has led to severances (authorized separation of a piece of land to form a new lot), subdivision and scattered development, and that avoidance of such fragmentation of the land base is the key to farmland preservation (BC Agricultural Land Commission, 2015; Brabec and Smith, 2002; Clark, Inwood and Jackson-Smith, 2014). According to Caldwell (2012), many authors (e.g. Bryant and Russwurm; Dodds-Wier; Miller, S.) go as far as to say that more land base is fragmented due to severances and scattered development than due to actual urban subdivisions approved for residential development.

There is increasing research interest in the disorder in the urban-rural fringes of growing and metropolitan areas caused by leapfrogging, a factor directly related to urban

sprawl in Kelowna. Newman et al cite Conzen (1960) when discussing the agri-urban landscape in the Lower Mainland of BC as “sprawl that has occurred in a ‘leapfrog’ manner, leaving pockets of both active and underdeveloped farmland between suburban areas” (Newman, 2015, p.99). Condon et al (2010) have also emphasized how much of the land in Metro Vancouver that was originally designated to be in the ALR is fragmented and abandoned for agricultural purposes, “either because it is too small or otherwise inappropriate for industrial scale agriculture use, being held for speculation, or a land endowed country residence” (Condon et al, 2010, p. 9). What has been experienced in Kelowna might also be explained as sprawl due to “leapfrogging” of the ALR, as suburban development continues to occur in the outlying hillsides. Some visiting scholars in geography presenting at a symposium hosted by The University of BC Okanagan in Kelowna, referred to a “pepperoni pizza” form of land use and zoning when asked about their view of how the city was developed (Rotary Centre for the Arts, Kelowna, 2014). This observation is not meant to suggest that there is poor planning in Kelowna, but does emphasize using a regulatory tool such as the ALR may have influenced the sprawling pattern of the city. Furthermore, according to Condon et al (2010), using the ALR to ensure land is available for food production may have failed to advance food security.

1.2.3 Is farming being advanced in the inner fringe of Kelowna?

The critics of agricultural land preservation programs in Canada ask if the protection of the lands alone will suffice to improve or grow the industry. The issue is raised regularly in BC and in Ontario where idle farmland continues to add fire to the debate (Caldwell et al., Condon et al., 2010; 2012; Globe and Mail, 2015; Katz 2009). In the case of BC’s Agricultural Land Reserve, there is documented evidence of agricultural land laying idle

often waiting to be urbanized as recently discovered in the Globe and Mail investigative reports (Globe and Mail, Nov, 2016). Metro Vancouver has supported this claim with respect to the declining use of agricultural land in the Lower Mainland where some of the most fertile soils in BC are located (Metro Vancouver, 2016). It is apparent that the same issues prevail in Kelowna and especially with the inner fringe agricultural areas.

Enhancement of agriculture means more than simply asking, is the land farmed or not. In many cases, land is under farmed in the inner fringe with hay or fallow grass. Therefore, a better understanding of agriculture in the inner fringe requires an investigation of the potential of the farm which asks: what crops are being produced, has there been capital improvement or value added investment such as storage, shipping or other ancillary developments? The ability of the farmer is a critical ingredient in this debate. For example, with a quickly ageing population, Kelowna farmers, like farmers across Canada, are in need of succession to new young and experienced farmers. The ALC/ALR was established based on the premise of protecting and growing the family farm (Runka in Katz, 2009), which is also being threatened in an ever-urbanizing city such as Kelowna. Nevertheless, farmers such as Kevin Day whose farm holdings are in the heart of the KLO-Benvoulin ALR block, offer optimism as to the future of agriculture in this city. He contends that Kelowna has the potential to become an agri-tourism hub and grow more food for local sales to feed more people, but young people must be attracted to and trained in farming (City of Kelowna Blog, July, 2016).

1.2.4 Can small lot farming play a role to advance farming in the inner city?

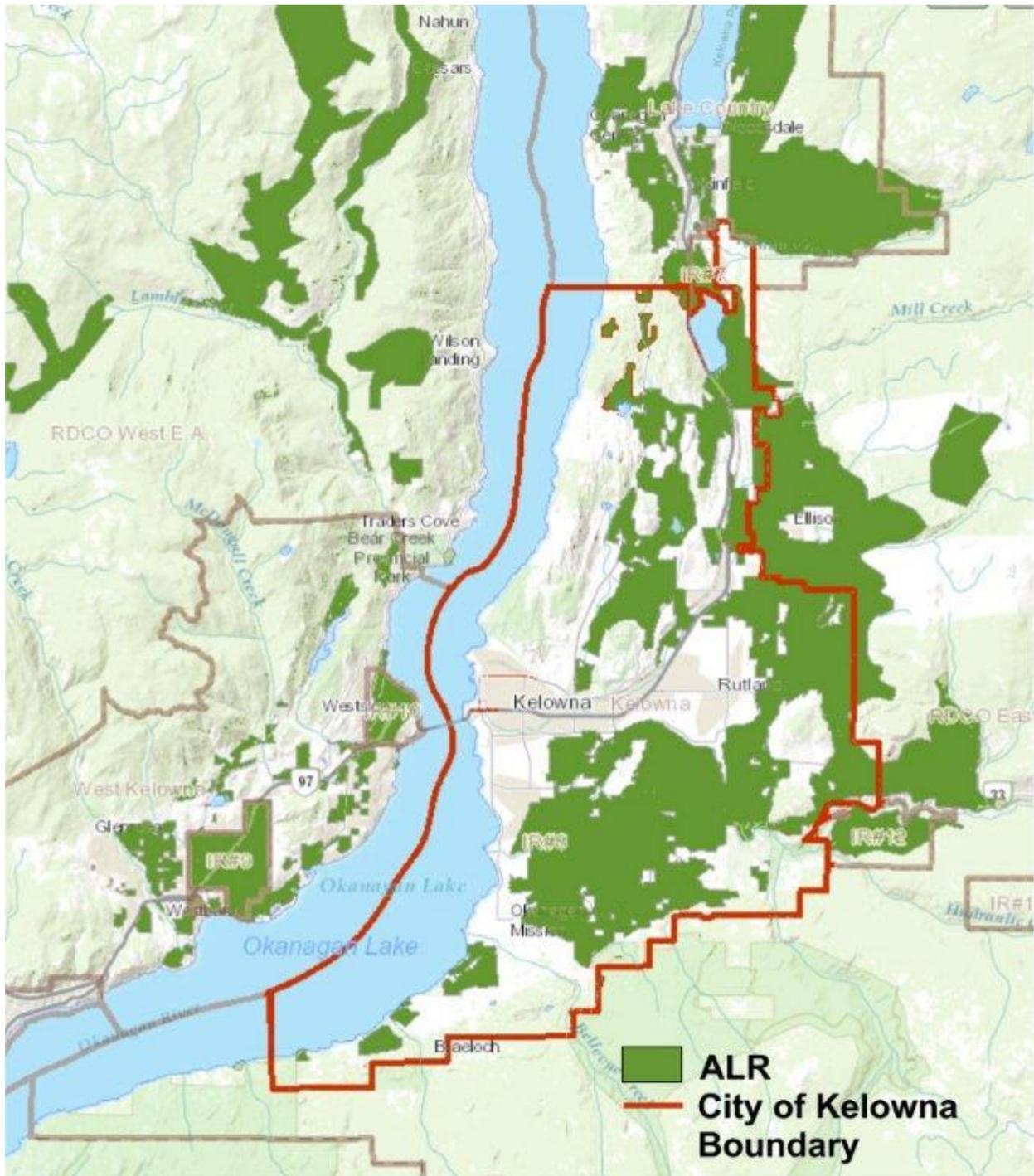
In recent years, there has been increased discussion about the role and future of small farms amongst scholars and government officials (Condon et al, 2010; Honey, 2014; Miller, 2013; Ministry of Agriculture, 2000; Mullinix et al, 2013; NIFTI, ND). Small lot (or plot) farms are defined as those that are smaller than what is presently available or often permitted. The feasibility of intensive farms have been described by those such as Mullunix et al (2013). The defence of such farms is their affordability, considered the main barrier to entry for young and new farmers. Even though there are many government policy directives (e.g. avoidance of parcel fragmentation) that are stacked up against the creation of small lots, there is enough evidence that suggests opportunities and demand may continue to rise (Ministry of Agriculture, 2000). However, in provinces such as BC, people are constantly questioning the utility and viability of small agricultural lots for future food production capability. The concern for fragmentation further limits the creation of small lot farms. Nevertheless, the support for small lot agriculture is growing and leads one to believe that further investigation, continued dialogue, and entrepreneurial perseverance will continue to help open more doors for small lot farms. It is understood that there is more evidence that severance minimums are creating unforeseen barriers for genuine farmers (Miller, 2013). The high minimums, according to professionals such as Dr. Sally Miller, who is currently working for FarmSmart (where she is developing alternative financing for new farmers), conflict with different forms of agriculture that are directed to local food markets. Miller and others contend that these types of farms tend to produce intensively on 5 to 10 acres, as well as benefitting from a close-knit agricultural community (Condon et al, 2010; Honey, 2014; Miller, 2013; Ministry of Agriculture, 2000; Mullinix and

Fallick, 2013; NIFTI, ND). These new, small-scale farmers, not unlike large-scale farmers, will support policies to reduce conversion of non-farm uses, but not bylaws that make it hard for them to access smaller lots. Sally Miller quotes Dr. Wayne Caldwell from a direct interview in 2012. He is one of the leading authors in rural and agricultural planning circles who has researched and defended minimum-size lot creation. As one that recognizes the conflict between established severance policies and new forms of agriculture that thrive on smaller lots, Caldwell states: “I question whether that policy is sustainable in the long term, as I don’t think future generations will stand by that criteria.” (Miller, 2013, p. 11). Is it therefore possible that small, local and more intensive/small lot farms could play a greater role in urban agriculture, and fill the void where farmland sits idle today?

1.3 The Study Area: Kelowna, BC

Kelowna, BC is the largest city in the Central Okanagan, and agriculture plays an important part of its history and economy. The largest component of a contiguous agricultural block in the Central Okanagan is contained within the City limits, but also extends eastward into the surrounding rural electoral areas and northwards into the District of Lake Country. The District of West Kelowna, on the west side of Okanagan Lake, also contains an area of agricultural land (Figure 1.1).

Figure 1.1 The ALR in the City of Kelowna and Surrounding Rural Area of the Central Okanagan



Source: Map prepared by E. Grifone, 2017;
Data by Provincial Agricultural Land Commission;
<http://www.alc.gov.bc.ca/alc/content/alr-maps/maps-and-gis/>

The setting for the research is the inner city agricultural-urban fringe in an urban jurisdiction where the population growth rate has been significantly high for several decades. The inner fringe is best described as the edge where the ALR is located immediately adjacent to urban uses within the city boundary (note: further definition is illustrated in Figure 1.2). Due to the conflict in uses at this edge, the agricultural lands contained within this municipality are worthy of study. The strong forces of urbanization pitted against agriculture have resulted in a situation of more than just conflict between these two land uses. The Kelowna case contains a number of interesting features that may be attributed to agricultural land preservation within the city. Some of these that have prompted this study include the following: recognized disorder of land uses in the rural fringe (in the interface area); urban and potentially non-compatible land uses located on the immediate edge of agricultural activities; various policies and regulations imposed by both local and provincial levels of government; many power brokers or stakeholders that have vested or societal interests in the agricultural-urban fringe, and the planning and development of the city as a whole; the speculative forces of urbanization; past, current and future farming practices; and the history of land use changes that have both agricultural and community planning implications.

The site for the investigation is governed by two main legislative directives: one is the Agricultural Land Commission Act, which defines the Agricultural Land Reserve (ALR) boundary within the City; the other is the City of Kelowna Official Community Plan, the local statutory plan that lays out land use designations and attendant policies, including (direction to) the zoning bylaw to help manage growth and development of all land uses in the city. Official maps (called “schedules”) delineate where the ALR and urban land use

designations (residential, commercial, institutional, etc.) meet, and where the conflict may occur. The maps also define the areas where suburban development in the form of mainly single family residential land uses have occurred or are planned in Kelowna. These are areas that critics have described as urban sprawl in a community that has more land than the City of Vancouver (212 km² compared to 115 km²) but a much lower population (124,900 compared to 647,500 in 2014).

Within the “inner” (agricultural-urban) fringe of Kelowna, two specific blocks of ALR were chosen to further explore the conflict situation: KLO-Benvoulin and South Lakeshore. These blocks are defined below and illustrated in Figure 1.2. These two areas vary in size, but represent many common criteria of the inner fringe conflicts between the ALR and adjacent urban pressures. Although the dynamics are unique to each, they both offer an opportunity to further define the problem and help answer the research questions. This description implies that the pressures of urbanization may be different and that the results on the agricultural lands may vary accordingly for each study block. The farmer/landowner candidates for the interviews were chosen from these two ALR blocks and the land uses within and around these agricultural areas were analyzed.

To explore the contention between agricultural preservation and the forces of urbanization, it was deemed appropriate to investigate three levels of site where the issue of contention was very pronounced. I chose (1) the ALR in BC; (2) the Kelowna inner fringe area; and (3) two study blocks within this city’s inner fringe where the competitive forces, or interface of urban and agricultural land uses, seem to prevail. An overview follows, and then the Kelowna situation is discussed in detail. Lastly, the two study blocks are described.

1.3.1 The ALR

The Agricultural Land Reserve (ALR) has been in place since 1973 and is recognized throughout Canada and North America as a successful method of agricultural land preservation imposed by the Province of British Columbia. Enacted under the auspices of the BC Agricultural Land Commission Act, via a quasi-judicial governing body known as the Agricultural Land Commission, the ALR is required to be recognized by local governments through their Official Community Plans. Local governments are mandated to enforce the legislation, and administer applications for subdivisions, non-farm uses or exclusion of land from the ALR. Although the ALR has been used to protect the integrity of (high quality) farmland in BC, it is a controversial zoning tool in the minds of many owners of farmland and those in the development community. Historical accounts note that 4.7 million ha. of farmland was identified to be protected by the Province in collaboration with Regional Districts. The ALR occupies 40% of the City of Kelowna land base (shown as green in Figure 1.1), including lands that are immediately adjacent to urban land uses, services and roads. It has rendered many inner-city lands not viable for non-farm development. Kelowna has some special qualities regarding its agricultural sector that makes it different from many other urban centres. Nevertheless, the ALR in Kelowna can be compared to the ALR situation in other urban centres of BC, or potentially extrapolated to agricultural land preservation in other urban centres in Canada. However, at present, only Quebec has similar legislation to BC's ALR.

1.3.2 Kelowna Inner Fringe Area

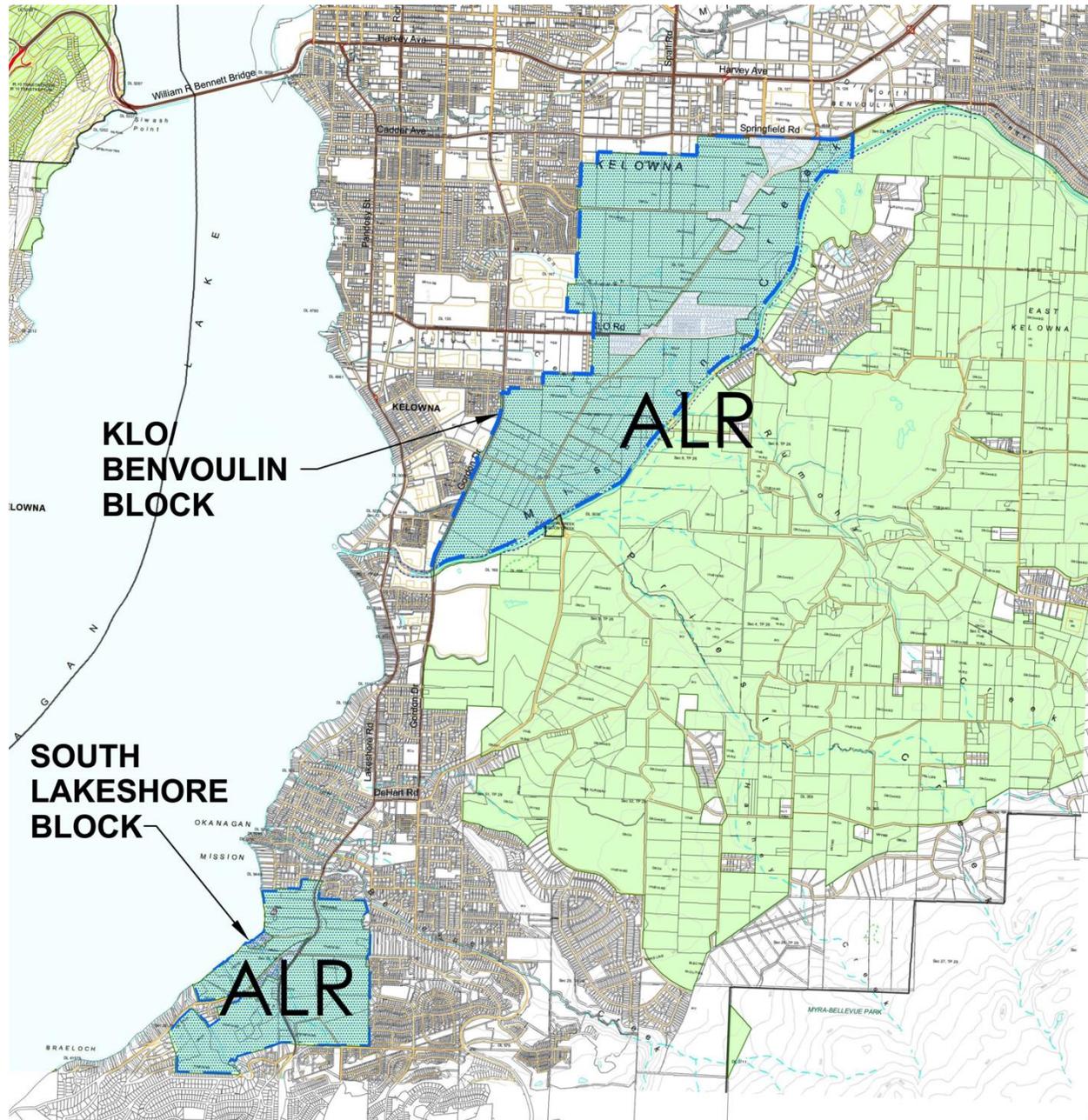
Large pockets of high quality agricultural land are located within the ALR, some of which form the immediate edge to urban uses, municipal utilities and roadways. The City's Official Community Plan has designated the ALR to be used for agriculture, but lands for various urban uses, including residential, institutional and commercial are designated immediately adjacent to the agriculture lands. Common elements to inner fringe areas are conflicts between the two uses, disorder of land uses, landowner expectations, land speculation, leapfrog development to more suburban locations, roads crossing through the ALR and attendant traffic implications. This inner fringe is the area where the agricultural land base has been subject to erosion through urbanization, or where the farmland sits idle or is under-farmed; the latter of which experiences the greatest speculation. Applications for exclusion of land from the ALR have typically been frequent in these fringe areas (Ministry of Agriculture, 2006).

1.3.3 Two ALR Blocks

The third level of investigation was focussed on two key blocks of ALR within the City limits. One was part of a larger contiguous block and the other was a smaller non-contiguous block (Figure 1.2). They were chosen for more detailed study, and served as the sites for the qualitative research. Farmers/Landowners within each block were chosen for interviews as part of a non-random sample. The two blocks, although somewhat unique, had common criteria. Nevertheless, the KLO-Benvoulin Block, according to the City of Kelowna, has experienced the greatest pressure for urbanization, and has been referenced as "the hot block" by City officials. The South Lakeshore Block, where there is less

speculation, is experiencing edge condition pressures, which have started to create expectations for non-farm uses amongst some of the landowners.

Figure 1.2 The Two ALR Study Blocks: KLO-Benvoulin and South Lakeshore; both blocks are inner fringe areas due to being adjacent to urban uses. The KLO-Benvoulin block is part of a much larger contiguous area of ALR (shown in green) in southeast Kelowna



Source: Map prepared by E. Grifone, 2017

1.4 The Kelowna Situation

Prior to adopting the Agricultural Land Commission Act, BC was losing 6,000 ha. of prime agricultural land per year to urban and associated uses (Vancouver Sun, November 16, 2013). The Central Okanagan, where Kelowna is located, was identified as one of the main regions where agricultural lands warranted immediate protection. Until the Act came into affect, local governments, mandated with land use planning responsibilities, were not able to stop or slow the urbanization of the agricultural land base in and around cities such as Kelowna. Even after the Act was imposed, between 1973 and 2006, an additional 1,300 ha. was released from the ALR in Kelowna (MAL/ALC, 2008). Today there are approximately 8,700 ha. of agricultural land (ALR) remaining within Kelowna's corporate limits (BC Ministry of Agriculture, 2011), which account for 40% of the city's entire land base (City of Kelowna, Official Community Plan, 2012). Only 73% of the ALR is farmed (Canada Census, 2011), and the agricultural land base within the inner urban fringe is interspersed with urban development, roads and municipal utilities. This situation makes the agricultural lands susceptible to development, further eroding the farming community. (Note: The Ministry of Agriculture recently published the Agricultural Land Use Inventory for the City of Kelowna, stating that in 2014 only 48% of the effective farmland was farmed (3,920 ha.) in the city (Ministry of Agriculture, 2016).

Provincial government studies claim that the ALR has been instrumental in serving as an urban containment boundary, helping to control sprawl in Kelowna (MAL/ALC, 2008). Others (Curran, 2005) challenge the belief that the ALR has largely halted the sprawl of urban and suburban communities over the agricultural working landscape, and suggest this belief is misleading at best. Smart Growth BC's notion that the ALR has allowed

farming to continue, and foster more compact, complete and affordable urban communities “may also be a stretch” (Curran, 2005). What is certain is that there are still intensifying development pressures on agricultural land adjacent to urban areas in the most productive agricultural regions in BC, including the Okanagan (Curran, 2005). More specifically, Kelowna, as the largest city in the Regional District of Central Okanagan, has had high population growth rates for several years in a row. As of June, 2015, Kelowna Census Metropolitan Area had the highest growth rate in Canada, with the city itself at a 3.1 percent annual growth rate. With a 2015 population of 117,000, a density of almost 70 persons per square kilometer and over 75,000 private dwellings, Kelowna continues to experience rapid growth of its urban footprint (Statistics Canada, 2015).

From an agricultural point of view, the Okanagan Valley is considered to have one of the most favourable climates in the Province (City of Kelowna, 1998). This favourable situation is attributed to a long frost free period, high temperatures during growing season, and sufficient water for irrigation of heat sensitive crops (MOE, 1986). Also, Kelowna benefits from its location between Okanagan Lake and hills to the south and east of the city. Topographically, there are many areas that have appropriate physical characteristics that support agricultural activities. Only 15% of the city’s land areas have slope gradients more than 30%, which is typically terrain that is considered unsuitable for agricultural activities other than grazing and pasture. The surficial geology varies within the city, because of the formations that occurred during the Pleistocene glacial period. As the ice receded, the terrain was left draped in glacial till. The combination of this till with organic matter, and the complementary topography, climate and time, resulted in the cultivable soils that have formed in many areas of Kelowna (MOE, 1986). Surficial geology mapping indicates that in

general, most areas of the city have some suitability for agriculture, based on topography, depth to bedrock and drainage. Dark brown soils (indicating organic matter) are found to predominate in the lower elevations of the Central Okanagan that are reflected in the Kelowna ALR lands (City of Kelowna, 1998). These soils, generally with CLI Class 1 to 4 lands, with an 'improved' rating, are included in the City's ALR (MOE, 1983). (The CLI classification system is explained in Section 5). These particular soils have a relatively high organic content and are quite fertile. When irrigated, they can produce a large variety of fruits and vegetables. With the introduction of irrigation (Irrigation Districts were formed in the 1930s), cultivated lands and orchards flourished in the City. Today, many of the agricultural lands within the City are utilized for orchards, vineyards, grazing and forage operations (City of Kelowna, 1998).

As with many other cities in North America, Kelowna's urban neighbourhoods have been located on the same landscape where the most fertile lands existed well before human settlement. Prior to 1973 and the introduction of the ALR, urban development absorbed considerable agricultural land in Kelowna. In 2008, the BC Ministry of Agriculture produced a comprehensive account of the continued assault of urbanization on agricultural land in Kelowna between 1973 and 2006. The report entitled "The ALR and its Influence on Agriculture in the City of Kelowna: A Review from 1973 to 2006" provides statistical evidence of the losses, gains and potential loss of the agricultural lands, based on exclusion applications to the ALC (BC Ministry of Agriculture, 2008). The statistics are noted in Table 5.1 of Section 5; highlights include the following: Out of approximately 10,000 ha. that were included in the ALR at designation, only 6,384 ha. would have remained in the ALR if all of the applications (total of 3,670 ha.) would have been granted approval. The 2,367 ha. that

accounted for applications that were refused, represented 423 parcels of farmland that were saved from development as of 2001. The same report also presents a vivid picture of how Kelowna could have evolved with its urban development pattern if the inner fringe ALR had been approved for exclusion. Although many of the applications were refused, some more than once, some high quality agricultural lands were lost to urbanization. Furthermore, the pressure along some of the edges continues today. The evidence of this pressure is seen in the on-going application process for exclusion or non-farm uses; considerable speculation; disorder with interim land uses and activities; and, the excessive amount of idle or under-utilized farmland (City of Kelowna, Report to Council on Agricultural Compliance and Enforcement Strategy, Feb. 23, 2015). Nevertheless, according to recent statistics assembled for a graduate thesis at the University of Northern British Columbia, the number of applications received from the City of Kelowna by the ALC has dropped substantially since 2006, but with annual variation between 2006 and 2014 (e.g. 31 in 2006; 6 in 2013, and back up again in 2014) (Daoust-Filatroult, 2016).

Another planning dynamic that results in continued pressure is relatively recent development adjacent to and within the otherwise contiguous ALR blocks of the City. This recent development is reportedly the main reason for high speculative values placed on many of the remaining agricultural properties in these fringe areas (Okanagan Mainline Board Realtors, Winter, 2016), including the KLO-Benvoulin and South Lakeshore ALR blocks. When one farmer sells out to 'development', the sale leads to the conversion of neighbouring lots, as other farmers seek similar windfall profits (Miller, 2013). In the Lower Mainland of BC, there are several accounts of purchases of ALR land expressly for speculative investment purposes, "fully expecting the ALR to break down in the near

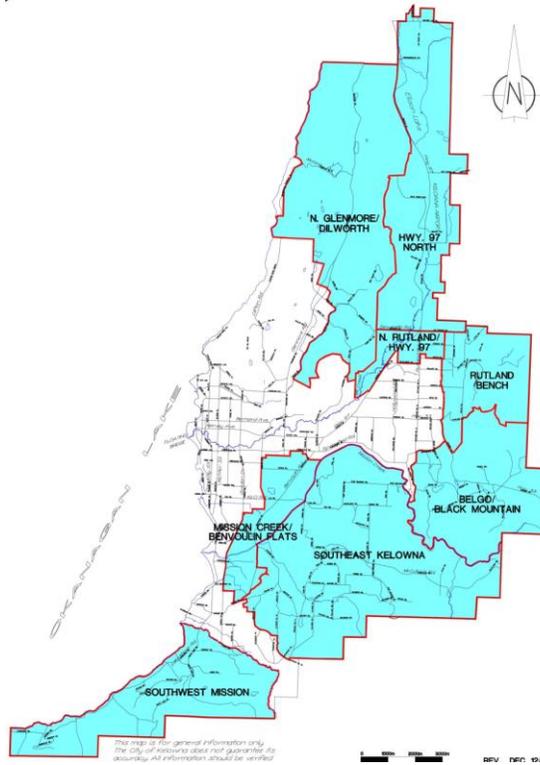
future” (Condon et al, 2010, p. 1, Discussion Guide). The trend is now prominent in the main inner fringe ALR areas of Kelowna (e.g. the KLO-Benvoulin Block).

Even if the adjoining, proximate lands are not removed from the ALR in these blocks, the agricultural rents are increased significantly (Livanis et al, 2006). This speaks to the concern that many investigators have, that the land becomes so overvalued by speculation, that it becomes one of the biggest impediments to entry for young, new farmers, or lower valued crop production that cannot compete with imported product (Condon et al, 2010; Dennis and Wittman, 2014; Honey, 2014; Inwood and Sharp, 2012; Livanis et al, 2006; Inwood and Sharp, 2012; Newman et al, 2015; Pfeffer et al, 1994). The situation is most prevalent in the KLO-Benvoulin ALR block where many agricultural parcels sit idle, For Sale signs are prominent and speculators are reportedly waiting to benefit from the encroaching urban land uses.

1.5 Two Study Blocks

Two specific study areas were chosen to gain a detailed understanding of the issues resulting from the problem and to help answer the questions noted earlier in this section. For the purposes of agricultural use and land management, the city is segmented into eight sub-areas by the City of Kelowna, largely associated with landform and other geographic features (Figure 1.3). The KLO-Benvoulin Block falls into the Mission Creek-Benvoulin Flats sub-area; the South Lakeshore Block falls into Southwest Mission sub-area.

Figure 1.3 Kelowna Geographic Sub-Areas



Source: City of Kelowna Agricultural Plan, 1998, p. 11

Each of these ALR blocks is bounded by recent development on several sides and meets additional common criteria described below. The other sub-areas were excluded because they are more distant from the forces of urbanization or do not represent the ‘inner fringe’ locations as described in the literature. For example, Southeast Kelowna, Belgo-Black Mountain, Rutland Bench, Highway 97 North, and North Glenmore-Dilworth are in more outlying areas relative to the core, or make up the suburban neighbourhoods of the city. The common criteria used to help choose the two “inner fringe” study blocks were lands with agricultural potential that are most under threat of urbanization, and that exist within or especially on the outer edges of the ALR. I looked for a rural-urban interface that was very prevalent, whereby roads, urban uses and utilities were immediately adjacent or even phased for expansion into the ALR. In many cases, these areas tend to have weak

defendable boundaries against urbanization, including limited or no buffers, except for roads. From within the block, it was important to have a diversity of parcel sizes that would help me understand the implications of land fragmentation on farming. Similarly, the lands could be occupied by active and successful farms, or lying idle and under-utilized, preferably for a long time. The predominant class of land was CLI Class 1 to 4, which is considered the most arable soils in the Okanagan, one that may be occupied by orchards, vineyards, crops, and value-added agricultural developments such as packing plants and wineries.

1.5.1 KLO-Benvoulin Block

This block is referred to by City of Kelowna officials as the “hot block” because of prevailing land use issues (City of Kelowna Planning Dept, 2016). Abundant evidence of land use disorder exists in this block, including: non-conformance and illegal land use activity; significant interim uses that are more commercial in nature than agriculture, such as large paved parking areas; and a proliferation of uses that farmers and property owners argue are non-compatible with agricultural. The most outstanding issue noted in this block is speculation of the agricultural parcels. Speculative pricing is some of the highest in Kelowna with prices comparable to those for farmland in the Lower Mainland of BC. The financial viability of many farm businesses in BC becomes questionable when land prices reach \$80,000 per acre. In Metro Vancouver, the prices range from \$150,000 to \$350,000 per acre for parcels 5 acres or less (Vancouver City Savings Credit Union, 2016).

In the KLO/Benvoulin Block, recent (2016) real estate postings (Figure 1.4) show the following examples:

i.	Byrns Road	33 acres	\$200,000/acre
ii.	Benvoulin Road	22 acres	\$114,000/acre
iii.	KLO Road	5 acres	\$360,000/acre
iv.	KLO Road	3 acres	\$333,000/acre
v.	Benvoulin Road	10 acres	\$200,000/acre

As in the Vancouver area, only a small number of landowner applications for exclusion of land from the ALR are successful, but the hope of success still encourages speculation and is a factor in the price of large and small parcels of farmland.

Figure 1.4 Photos Illustrate Diversity of Agricultural Properties for Sale in the KLO-Benvoulin Block



Source: Photos: Grifone, E. 2015, 2016

Figure 1.4 Photos Illustrate Diversity of Agricultural Properties for Sale in the KLO-Benvoulin Block, cont'd



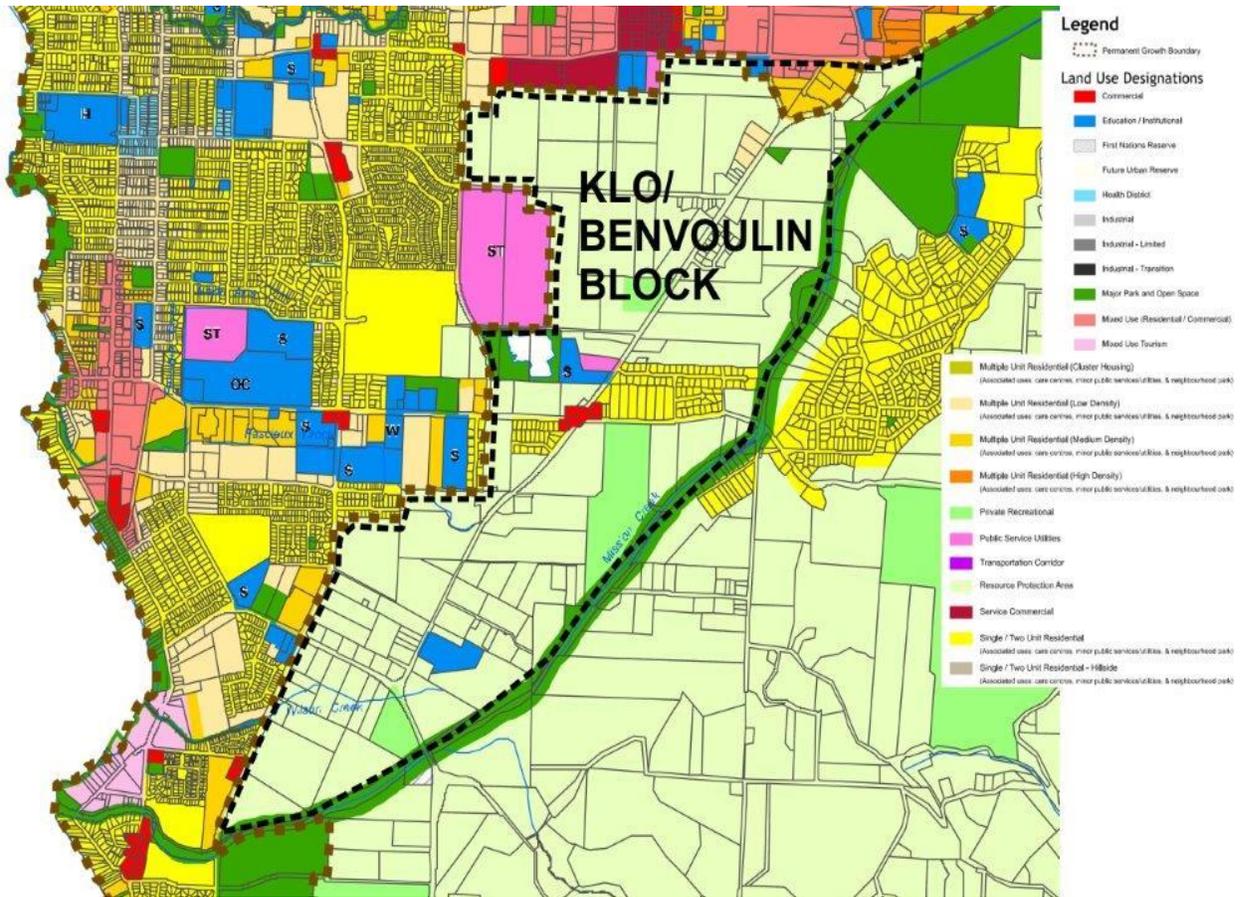
Source: Photos: Grifone, E. 2015, 2016

The dynamics of this area are certainly unique for Kelowna. The former planning policies set the tone for these dynamics to occur, and inadvertently provided the backdrop for the speculation noted above. In the mid-1990s, the City prepared the South Pandosy/KLO Sector Plan that established land use policies to be enshrined in the City's Official Community Plan. An important part of that policy direction was to control or stop the advancement of urban uses into the relatively contiguous ALR block. A combination of factors led to the proliferation of various urban uses taking hold, including construction of two schools, large care centres, a government office and associated play fields, and multi-family residential buildings in the area. Additionally, there is infrastructure to support this development including three major roads that skirt or run through this block: Springfield Road to the North; Benvoulin Road running diagonally through most of the block; and KLO Road that dissects the area running east-west. In recent years, these collector roads were identified as important traffic corridors and, subsequently, were widened and improved by

the City. Regardless of the ALR, development interests and investment have been attracted to these corridors. The ALC has refused most of recent exclusion applications in this block. An example of such an application that was refused was for a mixed-use project on approximately 24 acres that forms part of an 80-acre holding, much of which is already developed as a shopping centre along Springfield Road. Since the City of Kelowna had originally supported this application, other agricultural landowners received mixed messages about opportunities to develop ALR lands in this area.

This block also contains one of the largest flat areas of physically developable land located close to many existing large institutional land uses, including Kelowna General Hospital, several high schools, middle schools, Okanagan College, the Regional District headquarters, the main waste water treatment plant and a growing number of large seniors' care facilities (Figure 1.5). The KLO corridor is developed almost up to the intersection of KLO and Benvoulin Roads with a few remaining ALR parcels immediately along KLO Road. Recent land sale values and listed properties near this intersection represent opportunities for the land to be released from the ALR.

Figure 1.5 KLO-Benvoulin ALR Block with Encroaching Urban Edge Conditions



Source: City of Kelowna OCP, 2011, Map 4.1

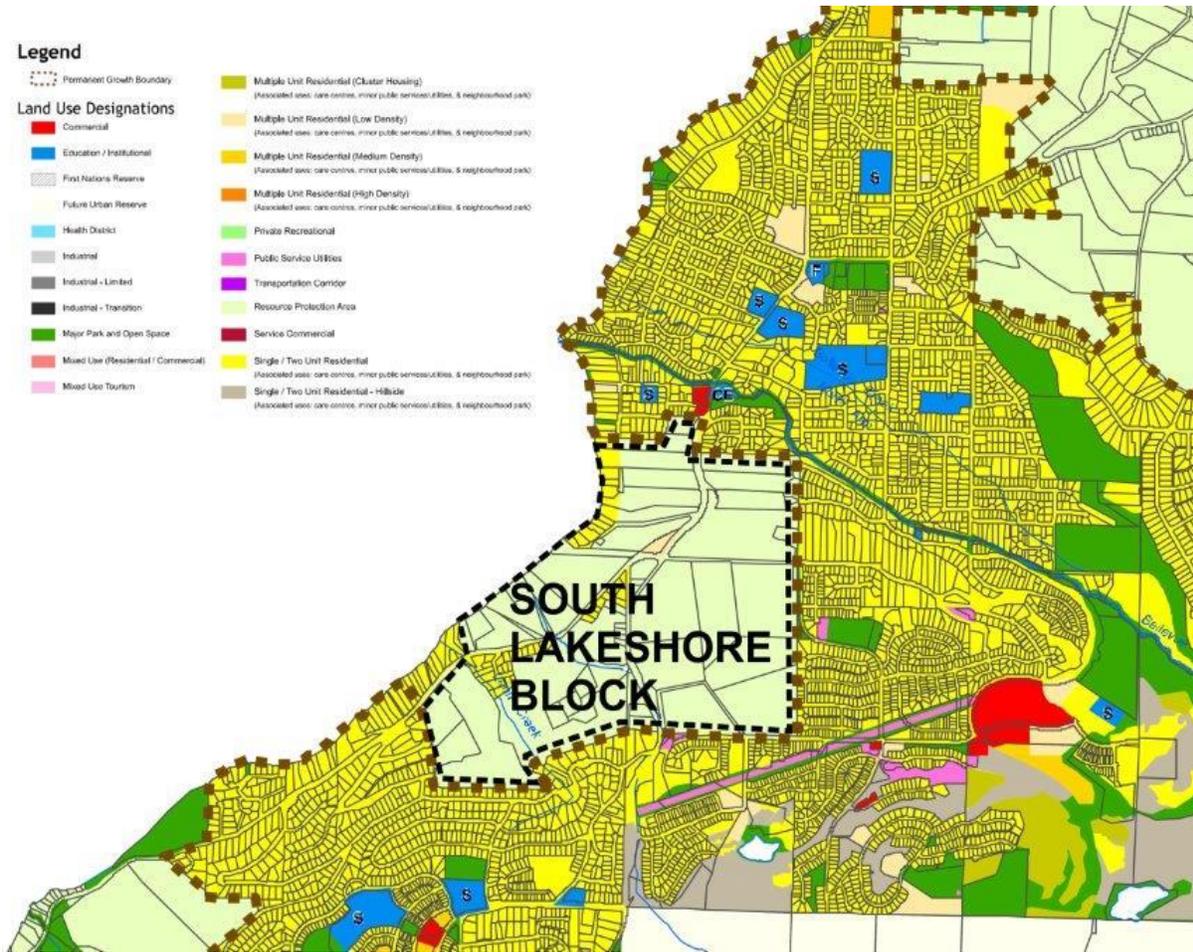
Soil and land capability is often contested by owners and is used to help defend positions for exclusion applications to the ALC. In this block, soil drainage impediments are often cited as a problem for agriculture with poorly drained soils north of Mission Creek. Although the detailed (BCLI) land capability for agriculture maps identify these soils as mostly Class 4W with some Class 5W, the soils remain very limiting for agricultural capability though some land has been drained by generations of farming families (Provincial District Agriologist, and farmers/landowners in KLO-Benvoulin Block, 2016). Without adequate work and investment, some of the owners in this area contend that their land cannot be economically farmed (City of Kelowna, Ministry of Agriculture and farmers/landowners in KLO-Benvoulin Block, 2016). These impediments together with the

impact of non-compatible urban activities have resulted in many requests for ALR exclusion, sale of the land, land sitting fallow, or at the very most, planting of minimal crops to just maintain the farmland tax status. The KLO/Benvoulin Block also contains some successful farms and orchards that often results in exacerbating the contestation between farmer and speculators. Nevertheless, with continued study and dialogue, it is possible that some form of order will eventually prevail, possibly even with urban uses and small farms existing in harmony.

1.5.2 South Lakeshore Block

The second study area, the South Lakeshore Block, is also located in the fringe and on the edge of an urban area. It meets all the same criteria as the KLO/Benvoulin Block even though it comprises a smaller land area. Although it is somewhat isolated from the core of the city and other urban centres, this agricultural block is threatened by adjacent urban land uses, mainly single family residential subdivisions. Figure 1.6 illustrates the recent development pattern formed immediately adjacent to the eastern and southeastern edges of the block.

Figure 1.6 South Lakeshore ALR Block with Encroaching Residential Subdivisions



Source: City of Kelowna OCP, 2011, Map 4.1

The South Lakeshore block differs from the KLO/Benvoulin Block as it is located on sloped and terraced land with the lower portions having immediate access to Okanagan Lake. The soils are moderately to well drained, creating predominantly Class 3 (improved) soils, but include some amounts of Class 1 and 2. The lands are largely planted with vineyards and cherry orchards; however, there are also portions of underutilized and idle lands. The landowner dynamics in this area are much different from those of the KLO/Benvoulin block. The absence of For Sale signs may indicate an interest amongst the current owners to keep their land and use it for farm businesses, estates or hobby farms. The ownership in this block is known to have a significant family history where several

parcels are held by various siblings. Very few of them occupy the land for farming purposes, as the younger generation of family members are making their main sources of incomes from vocations other than farming.

The location of this area on the southeastern slopes of Okanagan Lake lends itself to agri-tourism. Its proximity to Okanagan Lake, the spectacular views and its established profile have already made it a destination for international visitation as well as local tourists. It is the home of Summerhill Pyramid Winery and Sun City Cherries. Summerhill can be considered an international attraction with year-round visitation by bus tours. The Summerhill Winery and vineyard occupies 80 acres of land. Sun City Cherries is a 65-acre working orchard with one of the Okanagan's largest cherry packing plants that exports internationally. It has also become a tourist stop.

Over the last two decades, there has been significant residential growth in south Kelowna. The volume of residential traffic along South Lakeshore Road and Barnaby Road through the ALR block has increased accordingly. The City of Kelowna has plans to continue to upgrade roads in the vicinity of this block resulting in concern among farmers about the urban impacts mounting along with residential growth in south Kelowna.

Although the two main study areas are somewhat unique, the findings related to the problem of the conflict between urbanization and agriculture can be extrapolated to many other communities in BC or all of Canada where fringe conditions prevail.

The following sections of this thesis include:

2. A Review of the Literature (Academic and Government Publications)
3. The Research Methodology (Mixed Methods Approach)
4. The Findings – Qualitative Research
5. The Findings – Spatial Empirical Research
6. The Discussion (Answers to the Research Questions)
7. Conclusion (Some Recommendations)

Bibliography

Appendix Interview Guide

2. A Review of the Literature

This literature review summarizes and synthesizes academic and government research that addresses the context, conflicts and challenges of agricultural land preservation in the rural urban fringe, its impacts on disorderly development in the form of sprawl and leapfrogging development and the potential of small plot urban agriculture to address the problem that has been created by the influences of urban development pressure on the inner agricultural areas. The literature review was conducted in a chronological manner, starting with a review of the earliest scholarly work that investigates changing land use patterns, the impact of increasing urbanization on agricultural land and agricultural land preservation in Canada. As the literature review continued, more was learned about urban sprawl, leapfrog development and the advancement of suburban development as complicating factors that accompany agricultural land preservation.

Densification and small plot agriculture are posed as possible solutions to the dilemma of agricultural land preservation at the rural urban fringe. The potential of small plot agriculture is reviewed along with obstacles to its viability. The competitive forces of urbanization, even with strong agricultural land preservation policies and legislation, is seen to result in land speculation, disorder and a growing amount of idle farmland on the edges of urban areas. This view of the situation gave rise to investigation of urban agriculture and small lot farming as a way to maintain farming activity that could defend against the pressure to convert the land to urban uses.

2.1 Urbanization and Agricultural Land in Canada

The relationships between urbanization and agricultural land preservation in Canada have been the focus of academic attention in land use planning and urban and rural geography for decades. In the late 1950s and early 1960s, geographers such as Russwurm and Krueger wrote about the loss of food-producing lands in Eastern Canada, especially where fruit producing lands in Ontario were under threat from urban encroachment and fragmentation of farms (Krueger, 1959; Russwurm, 1961;).

Before the population growth and rapid urbanization that followed World War II, agricultural land seemed a plentiful resource and Canadians did not consider that such land was threatened. Canadian geographers such as Russwurm and Krueger, followed by Bryant and Beesley, were among the first to examine the impact of non-farm development on rural communities, and the associated loss of the orchard lands and resulting changes to land use patterns in the Niagara Fruit Belt of Ontario (Bryan, 1982). Researchers such as Kreuger used statistics (Statistics Canada) to support the notion that prime fruit producing lands were being lost to urbanization and fragmentation of farmlands (Krueger, 1959). This loss of agricultural land was the result of the expansion of urban areas; land consumption due to recreational homes and cottages; the purchase and non-farm occupancy of farms; and the creation of scattered rural residential development (Bryant and Russwurm, 1979). By the early 1960s, there had been considerable research undertaken that clearly depicted the loss of valuable agricultural lands (Class 1-4 CLI Rating) from the pressures to convert to non-farm uses (Bryant and Russwurm, 1979; Caldwell and Weir, 2002; Gaylor, 1979 and Beesley, 2010).

Local government planning departments imposed their own programs of farmland preservation, but the relentless forces of urbanization were too great to curb the continued consumption of the agricultural land (Wagner, 2005). By the early 1970s, provincial agricultural land preservation legislation was being enacted in Ontario, Nova Scotia and British Columbia. The battlegrounds between urbanization and the rural landscapes continue to occur in the cities' rural-urban fringes (Pryor, 1968). It is in these fringes that evolving patterns of land use and spatial forms have raised concern for agricultural land loss as well as leapfrog development, disorder and urban sprawl. By the late 1990s, there was significant focus on government initiatives that promoted compact cities and densification policies to mitigate or halt urban sprawl throughout North America (Filion, 2003; Wagner, 2005).

2.2 Agricultural Land Preservation

During the late 1960s Canadian municipalities recognized the primacy of agriculture in their communities. This encouraged local government jurisdictions to enact their own agricultural land preservation programs. Huron County, Ontario, for example, became known as one of the most successful programs in Canada (Caldwell, 1995). Although more Canadian jurisdictions, including local and regional levels of government and planning authorities, started implementing farmland zoning and other planning tools, it was not until the early 1970s that some provincial legislative action was taken with stronger controls to avoid farmland loss and subdivision (Furuseth and Pierce, 1982).

Concern for the loss of agricultural land continued throughout the 1960s and 1970s, resulting in State and Provincial government attempts at farmland preservation programs in North America (Beesley, 2010; Bryant, 1992; and Krueger, 1982). The first documented

farmland preservation program was in Hawaii, USA, in 1961 (Myers, 1976 in Bryant and Russwurm, 1982). The BC Agricultural Land Commission (ALC) and the Agricultural Land Reserve (ALR) were introduced in BC in 1973 (Order in Council, Dec, 1972/ALC, 1973). The Strategy for Ontario Farmland was introduced in 1975, and followed up by the Greenbelt Plan in later years. Ontario also brought in the first Land Trust, and Nova Scotia introduced a form of agricultural land preservation in the 1960s and 1970s, but then removed it in the 1990s. Quebec, that has the only agricultural land preservation program similar to BC, enacted its province wide legislation in 1979 (Furuseth and Pierce, 1982). In 2017, there is still concern about the impact of urbanization and sprawl on agricultural land, the natural environment and on the sustainability of our North American cities (Smart Growth America, 2014).

2.3 Protecting Agricultural Land in British Columbia

The Provincial Agricultural Land Reserve in British Columbia was established in 1973 as a provincially legislated zoning mechanism to curb the loss of agricultural land. It was realized that stewarding agricultural land and the farming economy was best addressed at the provincial level, as a matter of provincial interest (Smart Growth BC, 2007). After almost 40 years in existence, there has been virtually no net loss of the ALR in the province, partially due to lesser quality lands having been included while higher quality lands have been lost (Smith, 2012). Prior to the introduction of the ALR, the loss of farmlands amounted to 6,000 ha. per year; by 2005, that total loss had dropped to 600 ha. per year. This substantial decrease has been attributed to rigorous ALR legislation at the provincial level, and acceptance of the ALR by local governments in their own planning framework (Campbell, 2006).

Urban pressures continue to push up against the agricultural land base especially in the inner urban fringes of growing cities such as Kelowna. However, even with the substantial amount (1,300 ha) of agricultural land that has been released from the ALR in Kelowna between 1973 and 2006, 8,700 ha. of ALR remain (BC Ministry of Agriculture, 2006). This accounts for 40% of the city's entire land base (City of Kelowna, 2011). Only 73% of the ALR is farmed in Kelowna (Statistics Canada, 2011) and the agricultural land base within the inner urban fringe of the city is interspersed with urban development, roads and municipal utilities. This situation makes agricultural lands susceptible to development.

2.4 The Impacts of Agricultural Land Preservation in BC

To believe that the ALR has largely halted the sprawl of urban and suburban communities over the agricultural working landscape is misleading at best. Smart Growth BC's notion that the ALR has allowed farming to continue, while fostering more compact, complete and affordable urban communities, may also be a stretch (Curran, 2005). What is certain, is that there are intensifying development pressures on agricultural land adjacent to urban areas in the most productive agricultural regions in BC, including the Okanagan (Curran, 2005). Those ALR lands that are closer to highways are in smaller parcel sizes, within a smaller total (non-contiguous) parcel area and include poor soils are those that have been subject to ALR exclusion, and consequently, development (Stobbe et al, 2009).

The implications of preservation programs on farmland values have been studied extensively in the United States and to a lesser extent in Canada. In most cases, the agricultural preservation or protection programs do not significantly decrease farmland values (Blewett and Lane, 1988; Conklin and Leshner, 1978; Nickerson and Lynch, 2001).

Where landowners or potential buyers do not believe the land use restrictions are permanently binding, land values will not be significantly reduced by the land use restrictions (Nickerson and Lynch, 2001).

In British Columbia, many have argued that the ALR has been very effective in slowing and even curbing the loss of high quality farmland (Smith, 2012). Through enforcement and education, the ALC encourages local governments to plan their cities and regions with densification in mind. However, agriculture within the inner fringe has proven to be a challenge to land use planning and urban spatial structure. There have been substantial strides in the effectiveness of preservation programs since the early 1960s (Beesley, 2010; Bryant, 1992; Krueger, 1982), and provincial programs such as the ALR in BC have helped to curb the loss of agricultural land (Campbell, 2006). However, those agricultural lands protected within the inner urban fringe of growing cities such as Kelowna are considered true battlegrounds. These parcels of land have ‘premature expectations’ for development but excessive agricultural disinvestment (Conklin and Leshner, 1978). These parcels also continue to influence patterns of urban disorder and sprawl by causing leapfrogging development as they await an urban use.

2.5 Agricultural Land and Its Preservation: The Rural-Urban Fringe as Battleground

Although the rural urban fringe was conceptualized as battleground during the 1960s, Prior (1968) suggests that T.L. Smith had coined the term of ‘rural-urban fringe’ as early as 1937 when he applied it to Louisiana’s urban growth. In his book *City and the Urban Fringe*, Lal (1987) notes that the word ‘rurban’ was used as early as 1915 to designate rural land that was in the process of conversion to urban use. Kurtz and Eichler (1958) identified two sub-fringes in the rural-urban fringe: the “urban fringe” which is

contiguous with the central city (Kurtz and Eichler, 1958) and the “rural fringe” which is contiguous with the urban fringe. The rural fringe supposedly had a lower density than the median density of the total rural-urban fringe, and a lower rate of population density increases, land use conversions and commuting (Kurtz and Eichler, 1958). Other Canadian scholars also recognized that the urban pressures on prime agricultural land were being exerted in the rural-urban fringes of cities (Beesley, 2010; Bryant and Russwurm, 1979; Krueger, 1982; Russwurm, 1978).

Progressively more research recognized the tension at the rural-urban fringe (Hough, 1990; Edensor, 2002; and Murdoch and Lowe, 2003) as “a battleground between efforts to preserve rural land and the relentless forces of urbanization” (Hough, 1990, p. 88). Research eventually focussed on the inner urban fringe (Bryant, 1992). Both Bryant (in Canada) and Qvistrom (in Sweden), as early as the 1990s began to examine the inner urban fringe “where the conflicts were seen to be having implications of transformation beyond the rural-urban divide” (Qvistorm, 2007, p. 269). Although planning ambitions were to create order for urban expansion, the land use planning began to result in leapfrogging development and ‘disorder’ in the fringes; the “in-between characteristics are being ignored” (Slater, 1990; Qvistrom, 2007). Land in these locations was in the advanced stages of transition from rural to urban uses, or experiencing construction, and for which subdivision plans had been approved. In short, this was land where there was little doubt over much of its area about its urban-oriented function and ultimate conversion to urban uses (Bryant, 1992). The evolving character of this zone had become the norm and new terms were being applied to represent the implications of change (Andirac, 1999; Murdoch and Lowe, 2003; Pfeffer and Lapping, 1994; Pryor, 1968). References were made to ‘places

out of order' (Edenson, 2002); the 'peri-urban interface' (Allen, 2003); 'undefined places of land' (Murdoch and Lowe, 2003); 'in place/out of place' (Cresswell, 1996; Hough, 1990); and, 'where to draw the line?' (McCann, 1997).

Sprawl is seen by much of the planning community as one consequence of the tensions at the rural urban fringe. The academic literature abounds with research on urban sprawl and how it became the problem of modern cities that new urbanists wish to combat with smart growth principles (Filion, 2003). By the late 1990s, there was considerable growth in the literature and government initiatives that promoted compact cities and densification policies to mitigate or halt urban sprawl throughout North American metropolitan regions (Wagner, 2005). In recent years, numerous urban thinkers and new urbanists have pointed fingers at urban sprawl as the main problem associated with modern cities (Bruegmann, 2005; Gillham, 2002; Hayden, 2004). Similarly, densification, or creating more compact, transit-oriented, and walking-friendly communities are among planning concepts now accepted amongst planning practitioners and smart growth advocates. However, continued growth of suburbs around many North American cities is evidence that smart growth and other local government principles and policy directions are not successful in altering prevailing forms of urbanization (Filion, 2003; Monroe and McDonnell, 2008).

By the late 1990s, "smart growth had occupied increasing space on the planning scene" (Filion, 2003, p. 49). Sprawl was recognized as the ailment, or the urban problem of modern cities that new urbanists wanted to combat with smart growth principles. To effectively deal with sprawl, scholars defined it, redefined it and analyzed its impact to an excessive degree. Michael Smith (2009) suggests there have been at least eight major

books that have devoted attention to sprawl (Bruegmann, 2005; Duany et al, 2001; Galster et al, 2001; Garnett, 2006; Hayden, 2004; Jackson, 1985; Miller, 2008; Soule, 2006). Out of all the principal researchers and writers that have studied sprawl, only Robert Bruegmann claims that sprawl dates to the pre-modern city. He provided a much broader definition of sprawl to allow for useful comparison throughout time: "...low density, scattered, urban development without systematic large scale or regional public land use planning" (Bruegmann, in Smith, 2005, p. 232).

Further definitions of sprawl and descriptions of its impact on urban form, land use and quality of life have been offered by the Sierra Club International and the National Centre for Revitalization of Central Cities (Wagner, 2005). Regardless of the organizations or authors that have demonized sprawl, the effect of the automobile appears paramount as the cause in most accounts. The effects of sprawl have left a patchwork of developed and undeveloped lands in the rural-urban fringes of cities. Along with this spatial form, sprawl results in over consumption of petroleum, traffic congestion, pollution, ribbon development, unaffordable housing, low density suburbia, and a duplication of services such as policing, fire-fighting and elementary education (Gottdiener and Budd, 2005; Hayden, 2004; Wagner, 2005).

The impact of sprawl and leapfrogging at the urban edges and into rural surrounding areas on agricultural land preservation has been studied throughout North America. It is important to understand how sprawl, leapfrogging and fragmentation of the land base are inextricably linked in their relation to urban encroachment on the countryside. This is especially relevant to agricultural viability because the near-urban areas contain most of the Class 1-3 agricultural soils in Canada (Caldwell et al., 2012; Cathcart, 2013; Miller,

2013; Resource Planning Group, 2002). It is further argued by many researchers that sprawl, in the form of low density residential patterns of rural development, has led to severances, subdivision and scattered development, and that the avoidance of such fragmentation of the land base is the key to farmland preservation (BC Ministry of Agricultural, 2015; Brabec and Smith, 2002; Clark, Inwood and Jackson-Smith, 2014). Caldwell et al (2011) contends that more land base is fragmented due to severances and scattered development than actual urban subdivisions approved for residential development.

Leapfrogging development has led to disorder in the urban-rural fringes of growing urban and metropolitan areas (Conzen, 2015; Newman et al, 2015). Conzen in Newman's account of the agri-urban landscape in the Lower Mainland of BC states that "sprawl has occurred in a 'leapfrog' manner, leaving pockets of both active and underdeveloped farmland between suburban areas" (Newman, 2015, p 99). Condon et al. also emphasize how much of the land in Metro Vancouver, originally designated to be in the ALR, is fragmented and abandoned for agricultural purposes, "either because it is too small or otherwise inappropriate for industrial scale agriculture use, because it is being held for speculation, or because it is a land endowed country residence" (Condon et al., 2010, p. 9). Similar cases of disorder have occurred in Kelowna (Grifone, 2014) and suggests that relying solely on a regulatory tool to ensure the land is available for food production has significant limitations and fails to advance regional food security (Condon et al., 2010). This leads to questions about the potential role of human-scale, local and more intensive small lot farming in urban agriculture, filling a void where farmland sits idle today. Small plot and intensive farming at the fringe may be where the opportunity lies, to address the

battle between competing forces of agricultural land preservation and urbanization (Clark et al, 2014; Condon et al, 2010; Livanis et al, 2006). The hope that is instilled in this edge condition dynamic is that “we are now rethinking our cities with our food needs in mind” (Cockrall-King, 2012, p. 79).

Despite its apparent impact on leapfrog development and sprawl, agricultural land preservation at the rural urban fringe has not been studied widely. Many questions arise from this evaluation, for instance: Is it possible that preserving agricultural land in the inner fringe is causing sprawl? Conversely, could the benefit of developing agricultural land in the inner fringe outweigh the cost or negative impacts of sprawl? And how land use, urban form and development in the inner fringe has been affected by protecting the agricultural land versus developing more land in the inner fringe.

Leapfrogging urban development due in part to agricultural preservation practices at the rural urban fringe has become an issue as another form of sprawl (Ewing, 1994). The suburbs, through association with sprawl, became the next urban phenomena to challenge sustainable cities. The forces of urbanization, unchecked, have considerable financial capacity and market feasibility to keep growing the suburbs. One possible means to combat suburban sprawl is with inner city densification of residential and commercial development.

2.6 Towards a Solution: Densification

There is mounting literature on the benefits of the smart growth concept in North America. This concept calls for forms of urbanization that are “more compact, transit and walking-friendly, conducive to high-quality urban life, and less environmentally damaging and infrastructure hungry” than present urbanization patterns (Filion, 2003. p. 49).

Although in place since the late 1990s, smart growth has had weak effect on the predominant urbanization tendencies. The growth of the suburbs around so many North American cities is proof that smart growth or other principles and policy directions are not successful in altering the prevailing forms of urbanization (Filion, 2003, p. 50; Monroe and McDonell, 2008). Nevertheless, since the release of the Brundtland Commission Report in 1988, planners and urban scholars have held out hope that higher densities could be linked to sustainable urban development (Nyhuus and Thoren, 1997). There is a common understanding that if we do not densify, continued urban sprawl will lead to continuous loss of land and often, valuable agricultural land (Gillham, 2002; Wagner, 2005). Be they based on principles of smart growth or not, more North American municipalities are promoting policy directives such as revitalizing the core and inner city; infill development; and residential densification.

While trying to understand urban densification and how it can bring more sustainable development to our cities, we must understand the competing forces of suburbia. Not only has suburban development in Canada been creeping up on us since the advent of the automobile (Harris, 2005), the suburb has taken hold as a dominating choice of lifestyle (Breheny, 1992). Most of the suburban developments in Canada are relatively low densities, typically single-family residential land uses. Canadian planning scholars such as Grant, have posited that there is a significant gap between the theories of new urbanism, smart growth and sustainability principles and the real-life development practice of achieving the residential districts on the urban periphery (Grant, 2009). Suburban development that has little or no adherence to smart growth, new urbanism or sustainability principles continues to challenge the compact city policies of the 1990s and

the earlier visions set forward by urban thinkers such as Kevin Lynch, Jane Jacobs, Frederick Olmstead and Lewis Mumford, to name a few. If urban densification is to bring more sustainable development to cities, a more thoroughly planned densification process is urgently needed, consisting of both local and regional perspectives (Jenks, Burton, and Williams, 1996).

2.7 Towards a Solution: Farming the Fringe with Small Plot Agriculture

Viable farming of small plots is posed as one possible way to preserve agricultural land at the rural urban fringe. With the rise of attention given to local food movements, there is a corresponding interest in supporting new farmers and local farms. However, there are also concerns about the affordability and availability of land for these farmers. Small plots, those that are smaller than what is presently available or often permitted, are considered as one option. Unfortunately, small-lot agriculture may lead to increased fragmentation of the agricultural land base, which is what current farmland protection policies seek to mitigate through larger minimum parcel sizes. Hence, the demand for small lots that is arising from the food sovereignty and local food movement, is potentially at odds with farmland protection. The urban-rural fringe, where there is conflict between urban growth pressures and high quality farmland, sets a stage for investigation as the fringe is where the potential may lie to promote viable human scale agriculture (Condon et al., 2010).

This review takes two perspectives: the rising demand for small lots for agriculture and the implications of small lots, including potential fragmentation of the land base. Understanding the local food movement, including food security, food safety and food

sovereignty that has given rise to the small and local farms, is also important to gain a sense of strength or endurance in advancing the small lot concept.

In recent years, the Agricultural Land Commission has strongly promoted consolidation of “parcelized” areas and elimination of the break-up of farm units through the sale of individual lots. Considerable attention has been paid over the years to the potential conflict created by parcels of two acres and less which have the potential to be excluded from the ALC Act. These are parcels that have the potential to be subdivided into even smaller lots or be subject to non-farm use proposals. Barry Smith of the Agricultural Land Commission staff once referred to them as “potential time bombs” in the agricultural landscape (Smith, 1998, p. 57). The Ministry had estimated that province-wide, there may be in excess of 20,000 lots less than two acres in the ALR registered as of December 1972 that were exempt.

Provincial Government directives indicate how the legislation is stacked up against fragmentation or subdivision of agricultural land. In many cases, in Canada and the US, local governments are enacting their own laws to strengthen provincial and state legislation, respectively (Alberta Agriculture, Food and Rural Development, 2002). Local area land use plans and zoning are probably the most common form of local government land use control in the US and Canada. Many provinces and American states provide a system of preferential tax assessment on farmland. However, even with zoning and preferential tax programs combined, they are not preserving farmland from urban encroachment. In fact, BC government studies unequivocally state: “financial incentives to encourage farming can never be large enough to stall the trend to redevelopment by themselves” (Greenwood and Whybrow, 1992, p.159). Therefore, many local governments

continue to take the power vested in them to oversee planning in the urban fringes where the battle between urban growth pressures and agricultural land protection is being fought.

2.8 Speculation

The impacts of trends in land use control at the fringe are widespread in North America, though several issues are common among most cases and have implications for viable farming at the fringe. These issues include speculation. Commodification of land associated with urbanization is likely the most important source of wealth and power for land based elites. Where this dynamic is most prevalent in many parts of the world is where farmland is being converted to urban uses, which has led to higher farmland values, particularly in areas of rapid urban growth (Livanis et al., 2006; Pfeffer et al., 1994). Speculation of the land held in these reserve (BC) or greenbelt (Ontario) areas, for example, is rampant. In the case of BC, much of the ALR lands near urbanized areas have been purchased at values or are valued at orders of magnitude higher than can be justified by any form of conventional agriculture utilization (Condon et al., 2010). There are several accounts of purchases of ALR land expressly to hold for speculative investment purposes, “fully expecting the ALR to break down in the near future” (Condon et al., 2010, p.1). Condon’s work, [Agriculture on the Edge](#), and more recently, his team’s efforts to convince provincial and municipal officials to understand the benefits of a human-scale agri-food system, focus on the financial impacts of conversion of agricultural land to urban use. In the Vancouver area, the ‘lift’ can be significant, from \$40,000 per acre for agricultural land to over \$1 million per acre as urban land (Condon et al., p.110). Speculation in the Kelowna ‘agricultural’ area, in and outside of the ALR, has reflected these trends, even in what some

people are referring to as a 'down economy'. Daniels and Bowers argue that when one farmer 'sells to development', the sale leads to the conversion of neighbouring lots, as other farmers seek similar windfall profits, and fragments the tight-knit farming community (Miller, S. 2013).

Proximity of farmland to urban centres may also increase agricultural rents (Livanis et al., 2006). This speaks to the concern of many investigators who indicate that land becomes so overvalued by 'speculative amounts', it becomes one of the biggest impediments to entry for a young/new farmer or lower valued crop production that cannot compete with imported products (Condon et al., 2010; Dennis and Wittman, 2014; Honey, 2014; Inwood and Sharp, 2012; Livanis et al., 2006; Newman et al. 2015; Pfeffer et al., 1994).

2.9 Lands in Waiting

A spin-off of the land speculation issue is the amount of agricultural land on the urban fringes that sits idle or is "under" farmed or available for urban uses. In these cases, land will be left fallow while waiting for the values to rise, sometimes for many years. If left too long, it can become difficult to convert back to agriculture (Miller, S., 2013). In BC, Ontario and in some US states, investigators have found that agricultural tax regimes allow owners to produce minimum volumes of farm product per annum which in turn makes it even easier to hold land until prices rise enough for a sale to occur to developers (Condon et al., 2010; Miller, S., 2013). The policies have become enablers while speculative value remains unrealized (Miller, S., 2013). In fact, there is evidence that relying exclusively on the top-down regulatory tools to ensure land is available for food production has significant limitations. For example, in BC, the agricultural land (ALR) is protected by provincial

legislation, but the legislation is limited in its ability to enhance agricultural productivity or contribute to regional food security (Condon et al., 2010).

2.10 Barriers to Entry

The ability for new, often young farmers to take up farming, especially to replace the aging population of current farmers is questionable. With the average age of farmers approaching 60 years in Canada (and the US), more young farmers are needed (Statistics Canada, 2006). However, with the trend moving away from small family farms and in favour of agricultural consolidation and a corporate style of agriculture (Qualman and Tait, 2004 in Miller, S., 2013), entry into farming is often financially impossible. The 2011 census showed that only the number of large farms – those of 1000 acres or more – had increased over the previous five years (Statistics Canada, 2012 in Miller, S., 2013). The lack of smaller and more affordable farms, and accessible land, continue to be the main barriers to entry. If these barriers to entry continue, the concern that Canada is becoming a ‘food insecure’ nation is warranted.

2.11 Top-Down Legislation and Local Planning

Since the 1970s, many Canadian provinces and U.S. states have enacted stringent legislation to stop the loss of food producing lands (Furuseth and Pierce, 1982). This top-down legislation has been able to influence local government planning policies and regulations. In many cases, local government has learned to respect the directives of senior government and has incorporated the language and approvals framework into local and regional official plans, best practices, agricultural plans and zoning bylaws (Brabec and Smith, 2002; Caldwell et al., 2012; Pfeffer et al., Raja et al., 2008; Resource Planning Group, 2002;). Legislation in Ontario, BC and Oregon has enacted some of the most effective “top-

down” pieces of legislation with enough regulatory teeth to cause local governments to work in tandem with senior government imposed tools. Nevertheless, there are still many examples of disagreement between provincial legislation and policy directives and local interests (Newman et al., 2015). This is typically a result when local councils and boards’ political interests deviate from senior government policy. Newman et al. (2015) believe that because land use planning and land development controls are within the local political scope of influence, there will continue to be disagreement between higher and municipal levels of government about the use of agricultural land.

The discord is not only between senior government and local municipal officials; it is also between farmers and landowners. The Greenbelt Plan in one of Ontario’s most fertile regions has been the setting for a debate where local farmers have argued against its effectiveness to help enhance the economics of farming. Farmers in the Niagara area have challenged the minimum parcel size of 40 acres, as larger sizes are no longer financially viable farm operations. They contend that 20, 30 and 40 acre farms are going fallow and businesses are going under (Houle, 2015). Landowners within the provincially-legislated ‘Greenbelt’, say that the legislation is protecting the land but not helping farmers ensure the viability of their farms.

In BC, there have been some cases of large ALR blocks that have embroiled local and provincial governments, residents and stakeholders in debates over quality agricultural land under development pressures. Newman et al. (2015) have produced a cursory review of two City of Richmond areas subject to extensive battle and public dialogue, where development was impinging on urban agriculture, the local food movement and open space (Newman et al., 2015). The Terra Nova lands case started in the early 1980s with an

exclusion (from the ALR) application. In 1986 the City approved the Official Community Plan amendment for residential development on the property, against the recommendation of the Agricultural Land Commission to the Minister of Agriculture. In 1987 Cabinet approved the release of 129 ha. from the ALR, and a golf course component was left in the reserve. The public outcry continued and agriculture support groups took the case to the Supreme Court of Canada. By 1990, the Supreme Court upheld the rezoning to residential. Stakeholder groups did not give up the battle to retain the large block of agricultural land. In 1996, the City of Richmond spent \$28.5 million to purchase 22 ha. of the remaining undeveloped residential land (Newman et al., 2015).

Another example of top-down legislation intersecting with local government involves the Agricultural Land Commission (ALC) and the Regional District of Fraser Fort George. The Regional District recently advocated for more intensive small lot agriculture on the periphery of the City of Prince George in north central BC. The argument was made that development would serve as a buffer between urban development and large lot agriculture. The Agriculture Land Use Standing Committee of the Board claimed that subdivision in the rural area would introduce new families to farming, resulting in overall benefits to the community. The current minimum parcel size is 60 ha., which is intended to discourage subdivision and encourage agriculture. The ALC maintained their stand against fragmentation of the 60-hectare minimum, citing reasons such as encouragement of proliferation of rural residential lots; cumulatively eroding the arable land base; increases of potential agriculture-residential conflicts; and speculation and additional subdivision (Regional District of Fraser Fort George, Letter from the ALC, 2013).

The debate about severance, lot sizes and overall fragmentation of agricultural land on the urban edges continues. Severance minimums are used extensively throughout many jurisdictions in North America, especially to avoid attraction of residential uses. Be it 100 acres in much of Ontario, 40 acres in the Greenbelt, 80 acres in Manitoba statutes, or 80 acres as regulated in many of BC's OCPs, senior government guidelines advocate for larger lots and where possible consolidation of smaller parcels (Cathcart, 2013; Inwood and Sharp, 2012; Smith, 1998). However, there is increasing evidence that severance minimums are creating unforeseen barriers for genuine farmers (Miller, S., 2013). The high minimums, according to Sally Miller (2013), conflict with different forms of agriculture that are directed to local food markets. Miller and others contend that these types of farms tend to produce intensively on 5 to 10 acres, and benefit from a well-knit agricultural community (Condon et al., 2010; Honey, 2014; Miller, S., 2013; Mullinix and Fallick, 2013; Ministry of Agriculture, 2000; NIFTI, ND). These new, small scale farmers, not unlike large-scale farmers, will support policies to reduce conversion to non-farm uses, but not bylaws that make it hard for them to access smaller lots. Miller quotes Dr. Wayne Caldwell from a direct interview in 2012. Caldwell, as one of the leading authors in rural and agricultural planning circles, recognizes the conflict between established severance policies and new forms of agriculture that thrive on smaller lots. He states: "I question whether that policy is sustainable in the long term, as I don't think future generations will stand by that criteria." (Miller, S., 2013, p 11).

2.12 Land Use Policies

There is an increasing body of literature that advocates the integration of urban agriculture into land use planning and the use of community food strategies to achieve farmland protection on the urban fringe. In North America, farmland protection programmes have been put in place since the late 1960s and early 1970s (Furuseth and Lapping, 1999; Caldwell et al., 2007 in Perrin, 2013). Except for a few cases such as Oregon and BC, regulation has reportedly been insufficient to maintain large areas of agricultural land use within or close to growing cities. Even in those locations where some success has been achieved, critics are quick to point out the limitations of such top-down legislation. Condon et al. (2010) note that “relying exclusively on this regulatory tool (i.e. ALR) to ensure land is available for food production and to provide a buffer between agricultural and urban land has significant limitations, is politically polarizing, and fails to advance regional food security or food sovereignty” (Condon et al., p. 108).

Allen (2003) suggests that in Europe, zoning criteria based on density, morphology and urban-rural dichotomy of the territory proved “inadequate for addressing the characteristics of the interface’s ‘patchwork’ structure of the urban fringe” (Allen, in Perrin, 2013, p.22). Others proffer that many agricultural preservation programs, largely in the US, based on the exchange of development rights could be more effective farmland protection tools with the implementation of comprehensive land use planning (Pfeffer and Lapping, 1994).

In many cases, communities in urbanizing areas of the US are using a variety of tools to protect farms, farmland and the rural landscape. The American Farmland Trust, in analyzing what works to save American farmland, found that the primary community

responses have been two pronged: either by purchase of large tracts of land; or local government imposition of zoning and other regulatory requirements (Brabec and Smith, 2002). When Brabec and Smith reviewed the potential of three common types of land protection strategies, including (1) purchase of development rights, (2) clustering program, and (3) transfer of development rights, they concluded that all had challenges to avoid fragmentation, however, there was some merit in their ability to preserve farmland. The results of the research “underscored the importance of developing a coordinated strategy utilizing a variety tools to achieve optimum protection of the land base” (p. 266-267).

If the current top-down legislated regulatory approach is not working well enough, or a single purpose type of program is also challenged, what is the answer to achieve both the benefit of local urban agriculture and farmland protection? Many scholars are suggesting that the next generation of policy efforts to encourage the sustainability of exurban farming could be more effective by creating stronger ties between farm and non-farm populations, and adopting flexible policies that recognize the different ways in which farmers adapt to urbanization (Clark, Inwood and Jackson-Smith, 2014). In this regard, the need to bring planning and food together in forming new land use policy is therefore imperative.

Caldwell, in his extensive review of lot creation in the Ontario agricultural landscape, makes a strong case for the role and responsibility of the planning profession to ensure land use policy is “supportive of the need for the agricultural producer to adapt and change their operations in response to future trends...” such as peak oil, local food, climate change and population growth and food security (Caldwell, 2012, p. 70). Raja et al. (2008) note that, as the food system evolves into a more place-based system, there will be an “increased role for land use planning to promote local and regional networks between producers,

processors, distributors and consumers of food. (p.71). Understanding how local land use policy affects different farm types, such as large commodity-oriented farms versus smaller, direct sales farms, will be important in creating the new policy regime (Clark, Inwood and Jackson-Smith, 2014).

In the past, the role of city planners has been limited to ensuring the protection of agricultural spaces from urbanization (Perrin, 2013). Perrin's investigation of how a new land use planning paradigm can lead to improved food strategies in two European urban centres offers considerable support to applying paradigm this to the Canadian context. Perrin, of the National Institute for Agricultural Research in Montpellier, France, contends that we must now define activities and tools to promote the insertion of urban agriculture not only into land management, but also into a multifunctional land-use approach, linking planning with future opportunities for local food production (Perrin, 2013, p.29). The ways and means of making this new paradigm work may still require fine-tuning. Paul and Mackenzie (2003) assert concerns that traditional farmland preservation tools can not necessarily support the new food system goals. In some cases, traditional land use policy tools can create barriers to emerging forms of exurban agriculture. For example, "zoning meant to protect farms from nonfarm development often prevents those same farmers from developing value-added, urban-oriented businesses on their farms to serve new urban markets" (Clark, Inwood, and Jackson-Smith, 2014, p.4).

In summary, much of the recent literature comes to the same conclusion: considering the pressures for development and diversity of production in the fringe areas, and growing interest in the local food systems, it appears that conventional land use policy tools are inadequate to serve 21st century exurban communities. In light of this common

understanding, Condon and several other scholars “envisage building a municipal-focused agricultural sector in which agriculture and urbanity are inextricably linked via planning and economic strategy” (Esseks et al., 2008, in Condon et al., 2010). They contend that human-scale (small farms) municipal-focused agriculture should form the basis of a bio-regional agri-food system as a necessary pre-condition for creating local and regional food security or supply, and food sovereignty, or control (Condon et al., 2010, p.105).

2.13 Summary

The relationship between urbanization and agricultural land preservation has been studied extensively in Canada. The fact that the battleground of urbanization and the rural landscape is the rural-urban fringe of many cities has brought more attention to the un-ordered spaces that are being created through urban sprawl and suburbia. Agricultural land preservation has been recognized as a means to contain urbanization and curb sprawl. In BC, the power of the provincially legislated ALR has resulted in pockets of agricultural land within the inner fringes of cities such as Kelowna. Although scholars such as Bryant and his colleagues have begun to look at the implications of these lands described variously as “in-between, out of place and un-orderly”, they stopped short of investigating their potential effects on sprawl caused by the leapfrogging of urban and suburban developments. There is no doubt that quality food producing lands are sacrosanct in the minds of many residents, communities and planners; however, the effect of preservation of these agricultural lands on sprawl is not fully understood, nor are the potential benefits and implications of selected development of these inner fringe area lands on building liveable and sustainable communities and regions in BC.

Small plot urban agriculture has been posed as one possible solution to the wicked problem that is the dual desire to preserve agricultural land and stop disorderly development of urban sprawl and suburbia at the fringe. Here the literature also unveils a quandary whereby both a battle and an opportunity prevail in the rural-urban fringe. The battle is reflected by the relentless forces of urbanization and attendant sprawl, leapfrogging and fragmentation impacts on agricultural land. The opportunity is that some of the best agricultural soils in the country occur within and immediately adjacent to cities. Senior and local governments have enacted policies and regulations to try to mitigate the impacts and encourage farming. Although much has been accomplished in the preservation of agricultural land, the opportunity for farming is often compromised.

In this review of the literature, there are five issues common to the rural-urban edge: speculation, idle farmland, barriers to entry for new and young farmers, the relationship between top-down legislation and local land use planning, and sprawl or leapfrogging. An increasing body of literature endorses the integration of agriculture in land use planning; however, regulation and top-down legislation has reportedly been insufficient to maintain large areas of agricultural land use within or close to growing cities. Both American and Canadian scholars have advocated comprehensive land use planning to assist in more effective farmland protection. These scholars also argue for a next generation of policy efforts to encourage the sustainability of exurban farming and create stronger ties between farm and non-farm populations. The policies need to be flexible enough to recognize different ways that farmers can adapt to urbanization and to support the role of planning at the local level to be linked with local food production (Caldwell, 2012; Clark, Inwood and Jackson-Smith, 2014; Condon et al., 2010; Perrin, 2013; Raja, 2008).

Much of the recent literature has recognized that reconciling the opportunities of urban agriculture with the concern regarding fragmentation of the agricultural land base is not simple, but warrants further investigation. The track that some have taken to investigate the various models of farmland access that could avoid further subdivision is commendable. Nevertheless, more research needs to be conducted to ascertain applicability of these models for various parts of the province and the country; their financial viability; farmer's support compared to conventional ownership; and compatibility with urban uses. Future thinking on these and other possible areas of exploration could work toward reconciling growth management, addressing disorder in the fringe area, enhancement of agriculture and food security. It is understood that working towards this new vision may require a substantial paradigm shift. Understanding these issues can ultimately benefit land use at the fringe, agricultural land preservation and small lot farms in communities where prime farmland is to be farmed, and not just seen as an impediment to growth, a development opportunity or a hurdle for land use planning.

3. Methodology

Investigation of the relationship between agricultural land preservation and urbanization has been ongoing in Canada since the 1950s. In more recent decades the dynamic forces of urbanization have been relentless in the inner urban-rural fringes of cities where both agriculture and urban uses are deemed to have a rightful role to play. Most intriguing has been the influences of planning policies, regulations, market forces and the stakeholders' vested or societal interests in the land base of these inner-fringe areas. In the case of BC, the Agricultural Land Commission Act and attendant ALR have provided a strong means of agricultural land protection, but in doing so, introduced other factors in planning of cities such as Kelowna where a significant proportion of its land base is in the Agricultural Land Reserve. Some of those factors raised in the Kelowna case have been farmland speculation, land use disorder, leapfrog development and quality farmland remaining idle or under-farmed. This research attempts to understand the impacts of agricultural land preservation in urban areas and address the following questions:

- Is preservation of inner city agricultural lands working?
- Is urban sprawl being avoided?
- Is farming being advanced?
- Can small lot farming play a role to help advance farming in the inner fringe?

During the earliest stages of the research it was determined that in addition to the Agricultural Land Commission, there are other important stakeholders that have a role in influencing the dynamics of the inner city agricultural lands. These stakeholders have insight and knowledge to help answer the four key research questions and shed light imagining a 'new fringe' where urban uses and farmland could co-exist. It was for this reason that a mixed methods approach to the research was chosen, including qualitative

semi-structured interviews with key stakeholders and spatial analysis of land uses and land use densities. This section is organized to explain the research design and administration. It will cover:

- Empirical Spatial Context
- Interview Methods
- Sample Selection and Recruitment of Participants
- Interview Guide
- Interview Preparation
- Data Analysis - Qualitative
- Corroboration of Spatial Analysis and Qualitative Analysis
- Ethical Considerations
- Issues of Trustworthiness
- Limitations of the Study

3.1 Empirical Spatial Context

To understand land use conflicts in the rural-urban fringe within the study area, land use planning policy documents from the City of Kelowna were examined. This included a series of reports, maps and policy documents that would inform the research about land use, housing forms, development densities and real estate listings. The MLS real estate listings (Okanagan Mainline Real Estate Board) were especially pertinent to run a land speculation test on the agricultural land. The intent of this empirical work was to help answer the three main research questions: (i) whether agricultural land is being preserved in the inner fringe; (ii) whether farming is being enhanced in the inner fringe; and (iii) if sprawl is being avoided as a result of the ALR.

Empirical data were gathered to understand the two sample ALR blocks. The data includes land use and farming practices within the agricultural lands, and adjacent urban uses such as residential, commercial and institutional along with its supporting infrastructure.

The City of Kelowna Official Community Plan (Kelowna 2030) was adopted by Council in 2011 and forms an important backdrop to the empirical research. The two main study areas, the KLO-Benvoulin ALR block and the South Lakeshore ALR block, are designated as Resource Protection Area in the OCP. Along with that designation, the Agricultural Land Reserve is zoned separately and falls outside of the Permanent Growth Boundary (urban containment policy), inferring that no urban development or 'parcelization' (subdivision) of the land will be permitted. Farm protection policies and guidelines are also in place to try to protect the integrity of the agricultural resource area. Cadastral and zoning maps (City of Kelowna), Canada Land Inventory (CLI) maps (Federal Government) and agricultural activity reports (Provincial and Local Governments) were referenced to confirm land uses within the study blocks and along the outside edges where the urban pressures are being exerted.

The speculative value of farmlands within the study blocks were confirmed through a review of the MLS Listings and through personal communication with the listing realtors. The noted values were cross referenced with the average Provincial farm viability rates recently released by VanCity Bank and Farm Credit Canada (April, 2016). The residential density and housing forms in the suburban neighbourhoods were analyzed by using cadastral, zoning and subdivision maps of specific streets within the neighbourhoods. The calculations included the residential, park, open space and roadway land use components to derive the density factors for the entire neighbourhood. All the geographic areas, including lengths of roads, were measured using AutoCAD computer software.

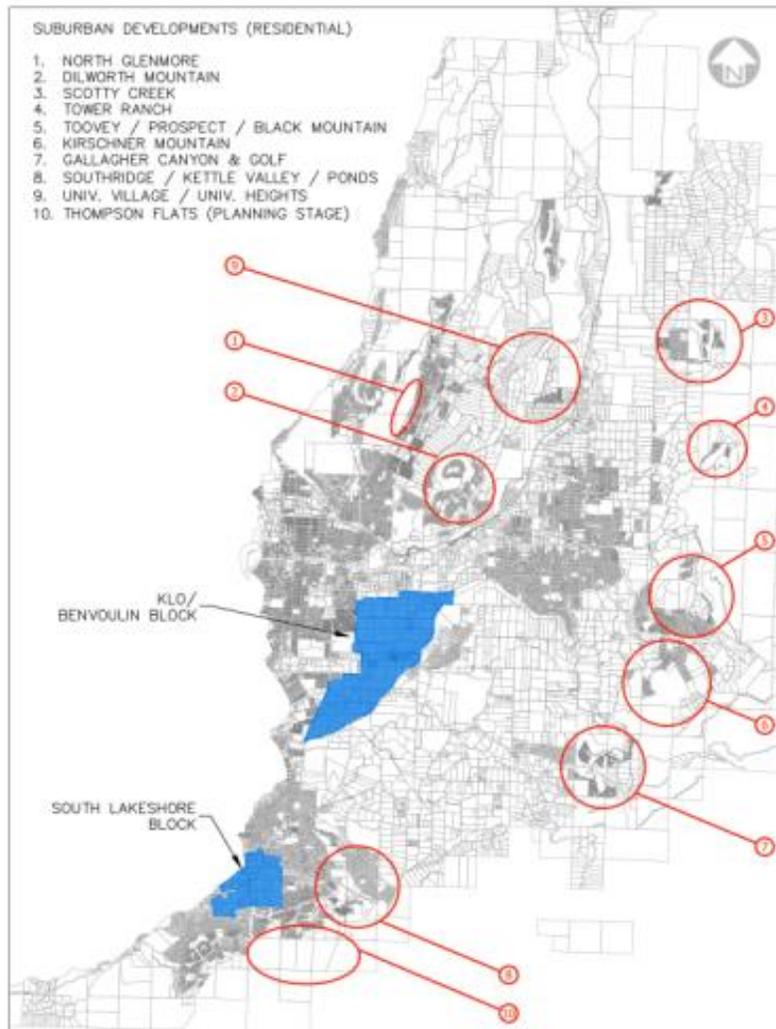
Lastly, residential density of various residential typologies were calculated to ascertain land use efficiencies. The objective of this analysis was to demonstrate land

consumption with various densities and the implications on sprawl and on agricultural land. The residential typologies used density standards that relate to types of housing that are currently being developed in the Kelowna area market. This includes low density single family residential, townhouses and low profile apartments with various ranges of density factors. Both net and gross density factor calculations were considered in the hypothetical applications. These were then compared to the specific suburban/outlying neighbourhood developments in Kelowna to help illustrate differences in land consumption between higher density forms of housing and the much lower residential density forms that are predominant in the expanding suburban neighbourhoods. The theory is that as Kelowna grows its residential neighbourhoods at relatively low densities, more land is absorbed and there will be greater threat on inner fringe ALR lands. The various residential typologies were used to help illustrate how building at higher densities would affect land use and consequently mitigate urban sprawl.

Ten suburban developments were chosen for review (Figure 3.1). Most of them are predominantly large (conventional) lot single family residential neighbourhoods with considerable undeveloped land where difficult topography prevailed. In recent years, some of these projects have begun to introduce a minor amount of small lot/compact single family residential and low density townhouses. To date, none of the areas studied contain any commercial convenience stores, except for Kettle Valley. The criteria for selecting these outlying recent developments were those such as predominate low density factors, distance from the city centre, lack of or minor local services (amenities) and extensive land consumption for population being served with full municipal infrastructure (roads, water

and sanitary sewer). Due to these types of factors, these neighbourhoods may be characterized as sprawl by some observers and in the literature.

Figure 3.1 Select Suburban Developments, Kelowna



**Source: City of Kelowna Cadastral;
Map prepared by E. Grifone, 2017**

3.2 Interview Methods

Semi-structured interviews were used to gather facts and opinions from the key informants that were chosen from three groups. Hay (2016) suggests that several researchers promote the benefits of such interviews for a study of this nature. The interviews typically allow the participants to offer differing opinions within and between

the groups. This approach was very appropriate regarding the topic of the ALR. The flexibility of the semi-structured interviews was used to uncover diverse opinions about the challenging topic of agriculture pitted against the forces of urbanization.

A semi-structured interviewing technique was also selected as it would help understand what was relevant to the informants due to their direct experience in their roles (Hay, 2016). The discursive approach is also a means to give the informants cause to reflect on their opinions and experiences, allowing greater access to information about the subject matter (Creswell, 2013; Hay, 2016). Interviews are also deemed to be another method of data collection to corroborate findings between data sources and have a holistic picture of the phenomenon (Bui, 2014).

Reflecting on Patton's various classifications of interviews, I combined several of his strategies including the use of an interview guide, an informal conversational interview approach and ability to use open-ended questioning, which further defines the semi-structured interview technique (Patton in Kitchin and Tate, 2000). Although a series of topics were presented for each group of participants, there also existed the ability to deliver more of a 'free-form' interview. This 'free form' allowed the respondent to offer specific views and opinions and put forward possible solutions for the inner fringe. Putting the respondent at ease and maintaining a rapport from the initial contact and throughout the interview allows for a very productive interview climate (Kitchin and Tait, 2000). Maintaining some structure, however, was important as all the people that offered to be interviewed were passionate about their roles in the community. The specific topics were repeated often so that respondents would not go off on tangents.

3.3 Sample Selection and Recruitment of Participants

The sampling procedure was purposive, including the recruitment of informants best qualified to address the research questions presented. The primary stakeholders that had potential to affect the inner fringe and influence planning in the Kelowna became apparent very early in the process. These general players (Figure 3.2) were identified by the researcher and then confirmed with municipal and provincial authorities (Ministry of Agriculture). I explored the legislative bodies, those with vested interest, those with land use management responsibility and public stakeholders. As noted earlier, four key informant groups were chosen to provide opinions and insight (noted in brown in Figure 3.2). Speculators were combined with the farmer/landowner group so that there were ultimately three main groups interviewed: Farmers/Landowners, City of Kelowna Planning Staff, and the Large Land Developers.

Figure 3.2 Main Stakeholders Affecting the Inner Fringe Agricultural Lands



Source: Prepared by E. Grifone, 2017

Groups that were excluded from the interview sample included the general public, the BC Agricultural Land Commission, and the BC Assessment Authority (noted in green in Figure 3.2). My reason for this selection was the position and role of two of these latter groups is well known through their legislation and mandated authority (Agricultural Land Commission Act, 1973 and BC Assessment Authority Act, 1974), and similarly how their responsibility applies to the study area. The public's opinion has been documented in opinion polls and through public consultation related to area/sector plans and regular Official Community Plan updates. The backdrop of the three excluded groups was important to understand for the interviews, but the focus remained on the Farmers/Landowners, planning staff and developers (Table 3.1).

3.3.1 Farmers/Landowners

A sample of farmers and landowners was chosen from each study area. The ‘gatekeeper’ approach was used wherein a long-standing member of the Agricultural Advisory Committee of the City of Kelowna identified numerous candidates that were known to him and had profile in the farming community and more specifically were in the two study blocks. Originally, 14 farmers were contacted but ultimately 12 agreed to be interviewed, eight in the KLO-Benvoulin Block and four in the South Lakeshore Block. Ultimately, only seven farmers/landowners were chosen in the KLO/Benvoulin Block, representing approximately 190 acres of land in the ALR. Four farmers/landowners were chosen in the South Lakeshore Block, representing 210 acres of land in the ALR. These farmers/landowners represented a cross section of the following:

- Owner/operators (full time farmers)
- Owner/speculators
- Farmers/Lessee
- Landowners/lessor
- Owner/farmers/processing on site
- Owner/living on land (minor production)
- Ownership of one or several parcels

However, not all the above-noted backgrounds were known at the outset nor used as criteria for the selection. The rationale was purposely kept loose, with the exception that all participants should have some knowledge of ALR and ALC legislation, farming practices and the constraints and opportunities of farming in the study area. It turned out that nine of the 11 candidates had extensive experience or knowledge of the ALR and ALC legislation, largely attributed to former dealings with the City and the Agricultural Land Commission regarding applications to subdivide, permit non-farm use or exclude land holdings from the ALR. Two of the farmer/landowner participants were also former members of the

Agricultural Advisory Committee of the City, allowing them to have even deeper understanding of the ALR/ALC.

3.3.2 City of Kelowna Planning Staff

Seven local government planning staff with a working appreciation of the ALR/ALC legislation were available in the Central Okanagan. Four City Planning Department staff agreed to participate. Their knowledge is both current and historic, including processing of applications under the Act, long range planning and processing of general development applications. Out of the four staff, two hold professional planning designations (MCIP, RPP), while the other two have a background in Landscape Architecture and Forestry, respectively. Regardless of their credentials, their extensive experience in planning and their knowledge of the ALR/ALC at the City level allow them to impart credible input about the conflict between agriculture and urbanization in Kelowna. Overall experience in planning ranges from 36 years to 14.5 years, and employment in the City's Planning Department ranges from 27 years to 2 years. All but one of the planners had been responsible for processing ALR applications. Although the ALC Act is defined as provincial legislation, the Act and the ALR designation are enshrined in the Official Community Plan and therefore administered and enforced by local government through their OCPs. The planners are given the responsibility to plan the City with the ALR forming a critical land use component. This responsibility includes reviewing applications pursuant to the ALC Act, be they for exclusion, non-farm use or subdivision, and making recommendations through to the ALC.

3.3.3 Developers

It is important to have input from the major residential developers that are developing suburban lands in Kelowna. These are the stakeholders who understand housing markets, residential densities and how to develop land to derive maximum profit. They also represent a group held responsible by some for creating sprawl by not building in the inner city, developing at relatively low residential densities and causing major urban services and roads to be extended towards the perimeters of the city or beyond the city. Eight developers were identified as active within the suburban neighbourhoods, five of whom agreed to be interviewed. Four of the developers are Kelowna based and all were represented by their CEO or development managers. The development projects they represent account for several hundreds of acres of land and planned communities, each made up of upwards of 500, and in some cases, 1,000 residential units, along with commercial uses in many instances. The projects were either developed in recent years or are in the planning and approvals stage at the City. Typically, they are so large that development is phased over several years, subject to market demand and servicing potential. The projects and the land holdings are located towards the extreme south end of Kelowna, on many of the hills of Kelowna or outside of the city. One developer has a holding within the KLO-Benvoulin Block.

As summarized in Table 3.1, the development backgrounds of the individuals interviewed are very extensive, with planning, design, marketing and financing experience. Combined experience was more than 100 years between the five participants, ranging from almost 40 years to approximately 15 years for each person. Two of the development

managers also had former experience working at the City of Kelowna. Everyone was knowledgeable of the ALR/ALC legislation in the context of Kelowna.

Table 3.1 Participant Profiles

A. Participant Profile - Planners				
Participant no.	Role	Experience	Knowledge of ALR*	
1.	Planner/Landscape Architect/ALR Application Reviews/Current Development Section	20 Years in Planning, Urban Design and Environmental Assessment; 2 Years at City	8	
2.	Manager Subdivisions and Rural Development Section	15 Years in Forestry and Local Government Planning, and Environmental Assessment; 9 Years at City	8	
3.	Planner/Department Manager Urban Planning Section	14 Years in Planning; 12.5 Years at City	7.5	
4.	Planner/Approving Officer/ALR Application Reviews/Current Development Section	36 Years in Planning; 27 Years at City	8.5	
B. Participant Profile - Developers				
Participant no.	Lands/Project	Ownership/Scale (Units)	Experience	Knowledge of ALR*
5.	The Ponds; Bellview; The Creeks; Ventures; Trestle Ridge; The Quarry	Ponds and Bellview: 800 Single Family Residential (SFR) Commercial: 800,000 Square Feet Creeks: 95 SFR Trestle: 82 SFR Quarry: unknown	30 Years as a Development Manager, Landscape Architect/Planner; Local Government and International both as staff and consultant	4
6.	Black Mountain, includes Golf Course; McKinley Landing; Thompson Flats	Black Mountain: 306 Acres (Several hundred SFR and TH) 306 Ac, includes Golf Course McKinley: 440 Acres (At approval stage) Thompson Flats: 155 Acres (At Master Planning stage)	15 Years as a Development Manager, city planner; Local government	6.5
7.	Kirschner Mountain	700 SFR and TH; minor MF	30 Years as Developer/Owner***/Rancher; includes owner of extensive ALR parcel	6
8.	Green Square; West Harbour; The Gates; Diamond Mountain	Green Square: 175 MF West Harbour: 225 SFR and TH Diamond Mountain: 1000 SFR and TH	40 Years as Development Manager; Commercial and Residential; Market Research and Sales	7
17. (also a farmer/owner; see below)	Several Commercial, Residential and Mixed Use	Extensive Shopping Centres and Mixed Use Res/Commercial	35 Years as Developer/Owner***/Rancher; includes owner of multiple ALR parcels	7.5

Table 3.1: Participant Profiles (cont'd)

C. Participant Profile - Farmers/Landowners								
Participant no.	Location	Farm Type	Parcel Sizes (AC)	Speculator	Farmer	Lessor	Lessee	Knowledge of ALR*
9.	KLO/Benvoulin	A	6/3/13/13	Y	Y	Y	NO	8
10.	KLO/Benvoulin	B	52/8	-	Y	NO	NO	6.5
11.	KLO/Benvoulin	C	6.5	Y	Y	NO	NO	6.5
12.	S. Lakeshore	D	80	Y	Y	NO	NO	7
13.	KLO/Benvoulin	E	2	-	Y	NO	Y	5
14.	KLO/Benvoulin	F	10/10/10	Y	NO	Y	NO	6
15.	S. Lakeshore	G	23.5	-	Y	NO	NO	4.5
16.	S. Lakeshore	H	65/15	-	Y	NO	Y (15 Ac)	6.5
17. (also a developer)	KLO/Benvoulin	I	24 (80)	Y	Y	NO	NO	8
18.	KLO Benvoulin	J	Several Parcels Leased	-	Y	NO	Y	5
19.	S. Lakeshore	K	40	-	Y	NO	No	5
Farm Type:								
A. Mixed Ground Crops/Fruit Trees/Nursery Stock/Corn								
B. Specialty grapes for local winery/Orchards								
C. Strawberries and other mixed berries/ Some Ground Crops (Idle as of 2016)**								
D. Mainly Vineyard/ Winery, includes Restaurant and Art Shop								
E. High Intensity Organic Crops								
F. Art Knapps Nursery/ Apples and minor Ground Crops/Hay field (Idle many years; includes commercial ventures)**								
G. Minor mixed Orchard; small hay field; small herd of farm animals (largely idle; includes storage)**								
H. Cherry Orchard; Packing Plant; Storage								
I. Idle** (Entire 24 Ac)								
J. Table grapes/cherries/ blackberries								
K. Minor vineyard/walnut trees/several homes (Idle)**								

Table 3.1 NOTES:

*Knowledge of the ALR/ALC legislation based on a scale of 1-10; 10 would be highest and represent knowledge equivalent to that of an ALC staff member.

** Idle = Extensive area or entire farm parcel/ownership is not farmed; may include storage for non-farm uses (RVs, etc.). Some of these landowners have no intention of using their land for agricultural purposes even if having to give up farm tax status.

*** Family-based corporation.

3.4 Interview Guide

Key research questions guided the interviews (Appendix). The general topics included agricultural land preservation successes, urban sprawl, advancing of farming in the city and the role of small lot farming. Specific questions probed for details within each of these general areas during the interviews.

3.4.1 The ALR

Since the ALR and ALC legislation is central to the thesis topic of conflict between agricultural land preservation and urbanization, the research had to establish an understanding of the participant's knowledge, perceptions and attitudes regarding the ALR and its effect on planning in the City. The questioning probed for opinions on the use of lands in the ALR, what may have gone wrong and what could be done right relative to using the ALR not only to preserve the best agricultural soils, but to enhance farming in a sustainable manner. Although most of these types of questions were directed at the Farmer/Landowner and Planner groups, the Developers were also asked about their opinions relative to leapfrog development potentially being caused by the inner-city ALR.

3.4.2 Land Use Planning Policies

The land use planning policies and regulations imposed by the City are inextricably linked to the ALR and how the inner rural-fringe has evolved and will continue to be shaped. Questions were asked about the type of policies that would affect urban sprawl, land use and density changes to promote infill development, the known implications of sprawl and if the policies may have changed under different councils, policy regimes or economic conditions in Kelowna. Much of the focus

around the policy discussion for all three groups was devoted to density of residential developments, especially related to infill.

However, all groups were asked about development trends, their planning perspectives about preservation of inner city ALR, and actual potential to develop some agricultural land in the interest of avoiding so much sprawl or suburban development.

3.4.3 Urban Sprawl

The debate about the impact of the ALR on urban sprawl prevails within planning circles. In 2007, a BC Ministry of Agriculture report claimed that the ALR helped avoid significant agricultural land loss in Kelowna and shaped the development pattern of the city without continuous outward growth of low density residential that was destined to happen without a strong agricultural preservation program (MAL/ALC, 2008).

The other perspective voiced by critics such as Condon et al. (2010), suggests that the ALR in urban areas has in fact caused urban sprawl, left patches of idle farmland and promoted rampant speculation by the landowners and developers. To address these conflicting views, several questions prompt the participants in all groups to comment on the following:

- Has the community/region experienced urban sprawl?
- Are there negative consequences and implications of sprawl?
- Is it possible to avoid sprawl?
- Should the municipality be enacting more or other policies to curb sprawl?
- Will infill and changes in density help slow or curb sprawl?

- What is the impact of the ALR on sprawl?
- What is the impact of the ALR on leapfrog development?
- Can sprawl be avoided while protecting all, some or most of the ALR in the inner fringe?

3.4.4 Land Speculation

There is substantial evidence of land speculation in the inner fringe farmland and in recent years it has reportedly increased. This research seeks to determine its prevalence, location, its impact on land values and if it can be curbed to protect future farming interests or even discontinue sprawl. As noted earlier, the farmer/landowner category of participants was partially made up of those that were assumed to have speculative interests. The interviews with the study participants were cross-referenced with the current (2015/2016) real estate listings of farmland in the KLO-Benvoulin Block. This provided an indication of whether their land was currently for sale, and how that position may have influenced their feedback.

3.4.5 Potential for Densification

Urban densification has been identified as a solution to agricultural land preservation by slowing or stopping sprawl. It was, therefore, important to ask the participants about their perceptions of building to higher densities, and in the case of the developers, their experience relevant to development of suburban housing, and implications for the inner fringe. The topic of densification also prompted a question about opinions of whether some ALR lands in the inner city should be developed at high densities to slow the growth of the outlying areas at low density as is currently occurring in Kelowna.

3.4.6 Farming Practices

The research seeks to develop an understanding of the potential to farm and advance farming in the inner fringe agricultural area. Interview questions not only addressed the potential of the soils to grow crops but also the means to encourage more farming in the area. Since the agricultural area is located immediately adjacent to urban uses, it is also important to understand if and how urban encroachment influenced the ability to farm or even lease the land for farming, along with the agricultural economics of maintaining a productive farm. More specific questions focus on means and conditions that would need to prevail to produce high yield crops (fruits and vegetables) and the type of crops that could be farmed along the urban edge. Since the investigation also considers the possibility of urban uses coexisting with farming, the farmers/landowners were asked how policies could be changed through comprehensive plans and phasing of urban development on agricultural land.

3.4.7 Small Lot Farming

A principle objective of the research is to test for the integration of small lot farms into the urban fabric of the city and in this case, in the inner rural-urban fringe of Kelowna. Numerous researchers and scholars have identified small lot farming as a means to address food security, food quality and sustainable practices in urban areas (Arsenault, 2015; Caldwell, 2011; Clark et al, 2014; Mullinix et al, 2010 and 2013). Small lot farming in Kelowna is posed as a means to promote farming in the inner fringe ALR and hence reduce the rising urban speculative forces. Interviews include questions to all participant groups about introducing

policies that would permit high yield small farms in the inner fringe of Kelowna. Since the City planning policies and the Agricultural Land Commission regulations do not currently support fragmentation of farmland, there was an interest in determining if there could be approaches to small lot farms that might reconcile farm fragmentation, and what other changes might support small lot farming.

In addition to the above questions asked of all participant groups, a subset of questions was posed to each of the participant groups. The questions focus on some different and some similar topics for each of the informant groups. For example, topics for the planners focussed on planning policy related to agricultural land protection and sprawl, but the topic of leapfrog development was presented to all three groups

Farmers/Landowners

This participant group had the most immediate knowledge about the land holdings in the inner fringe ALR and were therefore able to address questions about their perspective of farming and development in an agricultural area located alongside urban uses. A series of questions about the following key areas were used to gather both factual information and personal opinion:

1. The farmer/landowner and his land, including: location, years of ownership/farming experience, lands in production, types of crops and whether they farmed, leased or were interested in development/subdivision or exclusion. A knowledge rating of the ALR/ALC legislation was also noted, based on a scale of 1 to 10, with 10 representing a knowledge equivalent to the ALC staff.
2. Development potential of their lands, including expected time frame, potential uses of their land, impacts of adjacent uses and urban encroachment, and agricultural economics.

3. Enhancement of agriculture on their lands, including need for new policies, farming practices, types of crops and conditions that must prevail to try new crops/farming methods.
4. Development of inner-city lands versus or rather than development of suburban subdivisions. The question attempts to determine the farmer's sentiments about sprawl, environmental impact, and economic and social implications of one approach over the other.
5. The potential and role of small lot farming in the inner fringe ALR, including thoughts about whether such farm practices would help address food security and quality; policies to allow small lots to grow high yield crops; approaches to reconcile the concern for farm fragmentation; and other necessary changes that might support small lot farming, especially in the inner fringe ALR.
6. The interview closure prompted the farmer/landowners to offer insight about the challenges, opportunities and issues regarding farming and farmland in the inner rural-urban fringe of Kelowna.

Planners

This participant group is the most knowledgeable about the City's planning policies and how they are enforced, and the relationship between city planning policy and the provincially mandated ALR/ALC legislation. Planners were asked to provide perspective and history about a variety of issues that have affected planning in Kelowna. More specifically they were asked about the conflict or synergy between agriculture and urbanization in the fringe areas.

A series of questions about the following key areas were used to gather both factual information and personal opinion:

1. The planner's role at the City, including years of experience, knowledge of the ALR/ALC legislation, development approvals and involvement in overall planning of the community.
2. Urban sprawl, its cause, implications/impacts, and policies that could potentially slow or curb sprawl.

3. Infill and density factors that could be applied in the inner fringe or other parts of the city, using the middle housing spectrum to satisfy demand for other forms of housing other than low density single family residential.
4. Impact of the ALR on sprawl to help determine attitude towards a potential leapfrog effect and if removal of some agricultural land (from the ALR) would address the leapfrog effect.
5. Overall planning policies related to actual areas, development trends and political perspectives at the City.
6. Potential and role of small lot farming in the inner fringe ALR.
7. The interview closure prompted the planners to offer opinions about where policy direction may have gone wrong under former municipal councils and what could be accomplished if current planning principles such as 'urban containment' and incentivizing densification is pursued.

3.5 Interview Preparation

The interview questions were pre-tested with the thesis committee, professional colleagues and at least one member that represented each of the three groups. Based on the pre-test, some changes were made to some of the interview questions and means to prompt or probe were added before administering the questionnaire.

All candidates were initially contacted to brief them on the research topic, the researcher and to gauge their interest to participate. All but three of the preliminary candidates agreed to participate. The three that declined are all farmers, too busy in non-farm related endeavours to participate. Nevertheless, two of them took the time (over the phone) to offer their immediate opinions without any prompting, and suggested how important the topic was for Kelowna. In only two cases, amongst the farmers/landowners again, the candidate that was initially contacted, referred the researcher to a second-in-command. There were also six cases where

farmers/landowners invited their spouses to attend the entire interview with them. Interest among three participants in the KLO-Benvoulin Block and three participants in the South Lakeshore Block emanated from their family's recent or current involvement in an ALR application.

Invitations and arrangements for interviews were made initially by telephone and followed by email correspondence. Most candidates were prompt in replying. Several dates, times and locations were offered for the meeting. In most cases, the interviews occurred on weekday evenings and weekends, except for three of the planners; they were interviewed in their offices and in one case, over lunch.

A letter of invitation was used to solicit involvement, and to further describe the type of discussion topics that would be presented at the interview. A consent form, in accordance to requirements of the Research Ethics Board of The University of British Columbia, Okanagan Campus was presented to, and signed by, each candidate at the beginning of the interview. The consent form further described the research project and ensured the anonymity of the participants.

Interviews were conducted over a two-month period. Most interviews lasted 1.5 to 2 hours, with some extending well beyond two hours, where the informant was passionate about the subject, and the researcher was able to elicit quality input. In each case the questions were kept broad enough to allow the candidate to offer a variety of opinions related to the topic. It was also a valid means of getting different perspectives on a topic or question.

3.6 Data Analysis - Qualitative

Once all the interviews were concluded, the answers and discussion that were recorded in writing from each interview were transcribed onto spreadsheets, arranged by respondent and question/topic. The farmer/landowner group had 11 respondents and 11 topics of discussion. The planners included four respondents and 20 topics of discussion, and the developers had five respondents and 12 topics of discussion. Each of these included the base information about the respondent's profile. All feedback was then synthesized in accordance to the three groups.

Groups

- The Farmers/Landowners group was identified by farmer type, whether lessor, speculator or ALR applicant, location and farming history.
- The Planner group was identified by their relationship to ALR history, planning policy, application reviews, and current and future views of planning the inner city.
- The Developer group was identified by their backgrounds in residential, commercial and mixed use land development expertise, scale of projects and focus on various forms and density of residential development.

3.6.1 Categorizing the Qualitative Data

An important part of the analysis involved creating categories of themes and patterns of the respondent input (data) that would assist in the interpretation of the qualitative research results. The data culminates in 260 discussion points based on the questions posed to each respondent. The field data were transcribed into a single script on a large master spreadsheet. This step allowed the data to be collated for easy viewing and comparison of respondents and questions. Before classifying the myriad of data, I applied basic annotation that provided insight to important and salient factors amongst the data. This began to draw out commonalities or coherent classes of data. Connections were then made between

the classes of data, and recurring patterns emerged. For example, common responses to one question were often noted across all three groups, or a common disagreement was presented within one group. Similarly, there was often consistency in the responses to a particular topic in one of the study blocks. For example, concern for wetness of soils, or in both study blocks for example, concern for traffic along roads within the ALR.

Using a creative process along with the background of the specific question, eleven categories of themes evolved. All data were conceptually related to each other within these categories. Further sorting was then applied to corroborate findings with the spatial analysis, for example, especially where the connection was about one of the study blocks or a farming issue in the inner fringe generally. Although often a subjective judgement, such a connection supported greater validity in the analysis and ultimate conclusions.

I then assessed the situation relative to the two specific areas of study as well as the ALR in the inner fringe, generally. This included an evaluation of the empirical evidence collected from maps, reports and calculations on density exchanges, as well as other observations such as the real estate sales activities in the two study areas.

3.7 Corroboration of Spatial Analysis and Qualitative Analysis

The final part of the research includes a comparison of the findings from the spatial analysis and the qualitative data collected from the interviews. The mixed methods research approach allowed for a more comprehensive understanding of the conflict between agricultural land preservation and urbanization and more

specifically the situation in the inner fringe. The factual information and inductive reasoning that was extracted from spatial analysis (mapping) and the documented material (OCP, Zoning, government reports) was compared with the intuitive input from the interview respondents. Along with the density tests to determine effects of various forms of residential development on land consumption, I was able to corroborate the various data to help support the integrity of my conclusions. This in turn became meaningful information towards explaining the problem of agricultural land preservation versus the forces of urbanization in the inner rural-urban fringe and the implications of this problem on urban sprawl.

3.8 Ethical Considerations

This study considered the professional opinions of a group of participants in the municipal planning field, land development industry and the farming community. The researcher-informant relationship allowed for the participant to divulge considerable information and accounts that can be released into the public arena (Stevens, 2013). Using the semi-structured interview technique that prompted open discussion was also a means to elicit sensitive dialogue and perspective. In this regard, an ethical approach was required to protect the integrity of the participant, their confidentiality, privacy and any risk to them (Flick, 2009). Proper procedure reflected The University of British Columbia Course on Research Ethics (CORE) tutorial and certification. Participants were also informed of the minor or no risk that would be incurred if they engaged in this project. At the interview, all participants were asked if they had any concerns regarding conduct of the interview. A blank copy of the letter was filed with the Thesis Advisor at the

University of British Columbia Okanagan, Kelowna, BC. Confidentiality was upheld by not including any names of the informants. The name of only one farm was used to accentuate an important fact; the owners had no reservations of allowing their company name to be included in the findings.

3.9 Issues of Trustworthiness

Qualitative research is more than the investigation of a problem or a particular topic; it also involves the need to share, interpret and represent the experiences of others. As researchers, we need to take seriously the privilege and responsibility of interpretation (Nutt Williams and Morrow, 2009). Furthermore, the credibility and dependability of the research and the integrity of the data must be sound enough to allow future researchers to build upon what has been presented (Hay, 2016). With regard to the issue of trustworthiness, I offer that my research and analysis is credible and dependable to the extent that my work was adequately informed by a comprehensive literature review on three related topics, led by three senior professors at two Canadian universities; employing a rigorous qualitative and empirical investigation; interviewing and checking regularly with key informants on the subjects of land use planning, farming and development; and documenting my findings which are open to scrutiny.

3.10 Limitations of the Study

The ALR, as a legislative tool to avoid changing the use of land from agriculture to urban has caused much debate in cities such as Kelowna. Inherent in this study is the divergent opinions of landowners within the inner fringe where some farmers are successfully engaged in the agricultural industry, and an immediate neighbour

with idle land may have purely speculative interests. The sample group of farmers therefore contained some bias relative to the capability of their soils to support agriculture. The concern was not about sample size but more about consistency in the meaning of their replies. Many of the farmers had been recently involved in an ALR exclusion application and continued to maintain that their land was not productive and did not warrant the ALR status. The speculative interests often obscured the true quality of the soils and potential for agriculture.

Another limitation or delimitation was the fact that the research was focussed on two study blocks of ALR representing approximately 1750 acres of which 400 acres of land that the sample farmers owned. Although they are two critical areas under threat of urbanization, one could argue that the findings of 'ability to farm' cannot be generalized and applied to other areas of ALR in the City. Nevertheless, because the information sought in this study was specific to ALR blocks that were deemed the most under pressure of urbanization, site-specific data were used and corroborated with empirical evidence. Therefore, the findings can be applied in similar contexts or settings, respecting the theory of transferability to future research (Bloomberg & Volpe, 2008).

With respect to the empirical research, the Canada Land Inventory (CLI) for Agriculture maps that were used were prepared by the Government of Canada in the 1960s and early 1970s at a scale of 1:250,000. These same maps were used to establish the ALR in the 1970s and are still used today to assist the ALC render decisions on applications for exclusion, non-farm use or subdivision within the ALR. In some instances, farm/landowners will retain professional agrolgists or soil

scientists to conduct site specific evaluations to dispute the CLI rating, often due to the scale of mapping. The research for this thesis did not include such definitive evaluation; the CLI rating was accepted as noted on the Government of Canada map series.

Another limitation that cannot be excluded in a study of this nature is politics. Political influence in land use matters is prominent in local government and the ALR has been a controversial issue since its inception 45 years ago. As noted earlier, as long as land use planning comes under the legislative purview of local government, the ALR will always be contested between local government and the Province. The planners that were interviewed suggested that some of the reasons for former exclusions of high quality agricultural land in Kelowna was attributed to the political leanings of former councils and attendant policy regimes. Confirming the political philosophy of councils that may have been in office at the time of these decisions was not a key goal of this thesis. Nevertheless, the rationale for the planners' observations was substantive enough to document 'politics' as a factor that may have undermined the ALR from time to time. It is therefore possible that the planners' input may have been influenced by the political leanings of today's councils and attendant policy regimes.

4. Findings from the Key Informant Interviews

4.1 Purpose of Qualitative Research

Qualitative and quantitative research methods were employed to understand how agricultural land preservation has affected the rural urban fringe and urban form in Kelowna. This section presents the qualitative findings. The qualitative analysis used interviews with three main informant groups to provide insight into the conditions and the dynamics of the many forces at play in the study areas and throughout the city. Input from the interviews with a variety of local actors also leads to possible solutions to the problem. Data gathered through interviews help to answer questions about the success of agricultural land preservation within the city limits, avoidance of urban sprawl, enhancement of farming within the city, and the possible benefit of small lot farming to increase the use of idle farmland and limit land speculation.

Section 5 subsequently includes quantitative findings derived from map analysis and documented information, and an observational investigation of the two study blocks. Tests employing residential density calculations to help determine transferability of development between the suburban areas and the inner rural-urban fringe were also carried out.

The following interview results are presented according to the three informant groups and eleven categories of themes or patterns that emerged.

4.2 Key Informant Interviews

A variety of themes and patterns emerged from the key informant interviews. The themes are grouped into eleven areas of interest. In some cases, topics were

more generic so the findings represent input from a cross section of the groups. In other cases, the topics pertained mainly to one informant group. Where there is contrasting perspective on a topic, the responses are purposely segmented or the input clearly ascribed to one of the three groups. Also, where opinions differed, for instance support or non-support for a policy direction, the responses are segmented accordingly. The benefit of the semi-structured interview technique allowed for some rich commentary from the participants. The language used in their responses was therefore retained, with minor edits, or inclusion of some descriptive words in parentheses. The ideas and opinions are often presented in bullet form to illustrate comparisons of the respondents and to demonstrate a valid list of possibilities related to the discussion topic. The issue of leapfrog development is blended with the theme of the suburban development, while the issue of speculation and 'expectations for development' by the farmers is discussed throughout many of the other themes.

4.2.1 Theme/Patterns: Range of Responses

The interviews with the informant groups collected a range of responses that was grouped into the following themes. The responses are then discussed in more detail in accordance to each of the themes or topics. This qualitative data helped form a pattern that was woven by all three groups and for both study blocks.

- *Agricultural land protection issues:* Discussion centered on how the ALC/ALR is working to avoid continued urbanization of the inner fringe agricultural lands; past and current land use planning policy directives; and the many reasons why agricultural land preservation is so challenged in the inner fringe of a growing city.
- *Sprawl impacts/consequences:* Respondents offered their sentiments about reasons for suburban development, impacts of urban sprawl on community form, the economics and consumption of land, and the environment.

The discussion also addressed whether the inner fringe ALR is helping avoid urban sprawl, or in fact, contributing to it through leapfrog development.

- *Planning of the Inner Fringe/Policy direction in Kelowna/Density, infill:* The City of Kelowna is trying to impose their own policy directives to avoid the disorder in the fringe areas, and address the proliferation of sprawl with imposition of higher density housing forms and incentivizing infill development. This approach is being done in concert with the ALR, largely by using the Urban Containment Boundary imposed by the Official Community Plan.
- *Leapfrog development:* The accusation about the ALR causing urban sprawl in Kelowna was an important point of debate in the study. Some placed direct blame on the ALR as an 'agent of leapfrog development' potentially causing the many suburban developments, while others felt it was only partially to blame as market forces and former policy direction had contributed significantly to the suburban or more outlying residential development areas.
- *Farming practices/ability to farm in the inner fringe:* One of the main reasons for the different perspectives about the ALR in the inner fringe is that of the ability to farm. For those landowners that stress poor potential, they are adamant about exclusion of their lands from the ALR, support speculative interests and are much more reserved to offer options for enhanced farming practices.
- *How to encourage farming in the inner fringe:* Means and needs were identified for encouraging more and better farming in the inner fringe that would in turn protect the integrity of the ALR in this area of the city.
- *Small lot farming/potential for high yield crops in the inner fringe:* Small lot farms was an option that was offered for consideration of finding a solution to the continued speculation and aggressive forces of urbanization in the inner fringe ALR. A common understanding is necessary to garner support from senior government/ALC that appears adamant about avoidance of small lot farms due to the concern for fragmentation of agricultural properties.
- *Development trends and economics of development in the suburbs:* Developers of low density residential areas support their perspectives of market and consequently development trends. These are perspectives that translate into economics that make sense for home buyers and thus allow the development community to gain City of Kelowna approvals for large suburban residential development projects.
- *Speculation and expectations of development on farmer's own land or other farmland in the inner fringe:* The speculative forces are the greatest on agricultural land that is most proximate to urban development, utilities and roads. Gaining an appreciation for these forces may lead to solutions for enhanced farming or more efficient urban pattern of development in the inner fringe.
- *Potential for a blend of agriculture and urban development to be sustained in the inner fringe:* The coexistence of agriculture and urban uses was offered as a possible solution for consideration. Such a community planning concept, where agricultural land is prominent within urban settings such as Kelowna, will likely be under scrutiny for decades to come. The opinions and input of the various players

including the developers, farmers and City policy makers are important ingredients to the solution.

- *Inner city lands versus development of the suburbs:* Another solution for consideration that was offered was the potential benefit of using some inner fringe lands, including poor agricultural lands, for higher density development to help avoid or slow suburban sprawl.

4.2.2 Agricultural Land Protection Issues

The findings indicate that agricultural land protection in the inner fringe ALR lands has been challenged in the past and continues to be challenged today. The City planners supported their position that both sprawl and erosion of the agricultural lands in the past resulted from poor or misdirected policies by former Councils or insufficient enforcement of provincial and local regulations. Although the planners' opinions today are that new policy directives and renewed enforcement practices will be successful in helping avoid further loss of the agricultural land base, most the landowners suggested that the urban (especially residential) market forces are too strong, and that the area "will have to be developed sooner than later." Some of the landowners emphatically stated that because the pressure from the residents to avoid sprawl will be greater than the interest to protect "pockets" of agriculture within the inner fringes, more land will come out of the ALR and be subject to urban development. Some farmers, including those that have had a close association with the Agricultural Advisory Committee (AAC) of the City and been involved in ALR applications for their own land in the inner city ALR blocks, have witnessed support by Councils to designate lands within the city boundary for urban and non-farm uses. Even today, the AAC's

recommendations to refuse ALR exclusions and subdivisions are regularly overturned by Council.

When asked about the landowners' expectations for when their own land may have potential to be excluded from the ALR, the ones with immediate urban encroachment (in both blocks) offered comments such as the following:

- Yes, in approximately 10 years most of my land (35 acres) will be taken out of the ALR and be subject to urban development;
- Not likely until the next revision/update of the OCP, say in 3 to 5 years;
- I will not take the land out of the Reserve, but there is interest to create a world class destination with accommodation and a culinary school in the not too distant future;
- Not likely for 10 years considering its location and that it is being farmed; but the owner has it leased out to us, so you never know...and it is a small lot and one of the only ones remaining amongst a residential area and immediately adjacent to KLO Road;
- Glenmore had hundreds of acres excluded (from the ALR) and much of it was better land than that within the Benvoulin corridor, so why not....;
- The way it sits today, likely not for a while, but from the City's perspective, it may come out, but not based on the ALC timeline; also, fruit is not relied upon as food production/sustainability, so this land will be more susceptible to urban growth pressure;
- Although the recent decision on our second application (for exclusion) was refused again, we will not stop trying; is urban farming even appropriate in this area of the city?
- I believe we would have had a chance during the last OCP update, but now approximately 10 years is very likely, due to growth in Kelowna and the immediate area, and proximity to services.

These types of direct statements from the landowners that represented full time farmers and those with current speculative interests, provide insight to the fact that expectations for exclusion (of the ALR) and non-farm uses will prevail well into the future. The current city planners, on the other hand, strongly contend that a new policy regime and stricter enforcement will curb the urbanization of the ALR. They

cited examples of recent and proposed policy direction that Council of the day has endorsed, and that they hoped would “take hold.” Some of these included:

- Use of the Permanent Growth Boundary (UCB) in the OCP;
- Density increases in the five urban/village centres and the developed community;
- Avoiding subdivision on agricultural land or resource protection designations;
- Redevelopment of lands in the inner city;
- Educating people about sound community planning principles;
- Get people used to the fact that agriculture has a role to play in an urban setting;
- More enforcement of regulations;

Nevertheless, they do appreciate that speculation is rampant and the battle is still fierce, necessitating all parties to support the same vision. They also appreciate that the claims by members of the AAC that Council philosophies are not always supportive of agricultural land preservation within the city, but new policy directives are all pointing in the right direction, as far as they are concerned. All of this was said with an appreciation that the City is still having to administer and help enforce a piece of Provincial legislation which is “challenging at the best of times.”

City planners and farmers noted that the ALR in the inner fringe areas has been an important factor in keeping the city form more compact rather than it causing sprawl (through leapfrogging). “Look at what happened in the 1970s; if the ALR, or something like it, did not exist, 40 years later, much of that (agricultural) land would be houses...”. These statements were complemented by the acknowledgment that the ALR’s value in Kelowna is ‘aesthetics first and food second’, as viewed by residents of the community and noted in public forums. One planner suggested that they had “no problem with leapfrogging over the ALR, as people like the agricultural character within the city.” Another planner indicated that public planning surveys will often reflect the “charm” of the area as a number

one priority for the city's land use plan: "protect that charm for the urban area landowners," when the planners are advocating that "the amenity or charm of the Kelowna lifestyle gets in the way of understanding what the ALR should be used for...farming." However, the most senior planner that was interviewed felt strongly that policies such as the UCB has "made speculation run rampant" in the inner city ALR.

All planners argued for more enforcement of regulation to protect the ALR from urbanization, but they admitted that enforcement alone would not be the answer to the enhancement of farming of those lands. Nevertheless, they held out hope that if enforcement is used over the longer term, developers/investors and landowners/speculators will get the message that the ALR is only to be used for farming. Many of the landowners on the other hand, believe that Council policies are forever changing to suit them during their time in office, potentially causing large exclusions to be supported. One farmer strongly suggested that "different policies and regulations should be established to support the industry that has 40% of its land base in the city." In this statement, he was inferring that the current measures of supporting farming in an urban environment may not be working, and that government either should work harder to enhance farming or "learn to understand that the agricultural land base will always be threatened" (by urban forces).

A key issue that was prevalent in Kelowna during the period of the interviews was the non-farm applications for agri-tourism uses such as campgrounds. This was contentious as many farmers felt that agri-tourism uses would make an orchard

business viable, while others issued caution that such approvals would open a 'can of worms'. Generally, there was a feeling amongst many farmers that different rules were being applied to different cases causing landowners to question the ideologies of Council when it came to the inner city ALR. One farmer summed it up by stating: "we are uncertain of what can be developed or what should be farmed when (the site) has been compromised by the new (permitted urban) uses next door." This sentiment was echoed by another landowner that recently had his application for development supported by the City, but ultimately refused by the Agricultural Land Commission: "Council supported (my application) 100%, but the Land Commission locked it up (refusal) for at least 25 years." He concluded by stating: "Speculation in this corridor is the prominent 'use' and unless something creative is done, lands will continue to sit idle."

4.2.3 The Impacts and Consequences of Sprawl

It is understood that urban sprawl is inextricably linked with agricultural land loss and preservation at the rural-urban fringe of cities. The inner fringe ALR situation in Kelowna has contributed significantly to the challenges of planning and design of the city's urban form. What is debated is the issue of sprawl, has it occurred, where it has occurred and why. All informants were asked about sprawl and their sentiments about the impacts and consequences relative to planning and developing the city.

All planners that were interviewed accepted the fact that urban sprawl has occurred in Kelowna. As quickly as they were to recognize that sprawl had occurred

and the many negative consequences associated with it, they expressed differing opinions of the causes for sprawl in this city.

Common statements amongst them included:

- The previous OCP policies and Zoning Bylaw were insufficient to address this problem;
- Market tastes (preferences) have caused it as the market (buyers) want views that the outlying areas provide (and that the flat inner city does not);
- There was surplus land with easy access (to it) in the past;
- Everyone wants a piece of dirt (residential lot) to call their own; it is ingrained in our culture;
- Even with a shift in demographics, most families would like to have a single-family lot;
- Baby boomers have their heart set on a single-family home;
- Councils are still making their (development approvals) decisions on what the market (developers) says;
- Certain size (larger) lot demand has been the main reason for the sprawl;
- Transportation (the automobile and roads) makes it too easy to extend services and housing into the outlying areas;
- Taxes and development cost charges are too low in these outlying areas.

They also noted how the City is trying to ‘work away’ from the poor results of the past. None of them denied that the ALR was partially responsible for the sprawl, but instead referenced both market conditions and previous OCP policy that were the main contributing factors: “We have used policies that were contrary to avoiding development in the outlying areas.” At least one planner with a long history at the City also acknowledged that the amalgamation of three smaller communities (Rutland, Mission, and Kelowna) influenced the ability to manage growth, which the City of Kelowna ultimately had to address.

All planners recognized that the ALR has been partially responsible for the sprawl, but noted that even if the ALR was not present in the city, Kelowna would still have suffered sprawl effects. The developers cited the economic feasibility of

being able to build in the outskirts of the city: “the economics of going out into the outskirts is still viable because of the abundance of undeveloped land that is available.” The (relatively low) costs for developable land in the inner city are continuing to push development/subdivision towards the edge of the city. One developer that has had a long history as both rancher and developer in Kelowna pointed out that this city was recognized many years ago (before the introduction of the ALR) as having more land than other Okanagan cities such as Penticton and Vernon, so development was attracted (to Kelowna) but is now being constrained by policies such as the ALR. He stated: “It is inevitable that sprawl will be one way to react to the constraint”.

With respect to the impacts of sprawl and consequences for planning the city, all planners noted the greatest challenge the city must now contend with is traffic, offering statements such as the following:

- Traffic problems in this city are a huge consequence of our sprawled urban form;
- Too much dependence on the automobile is causing traffic issues and demand for large roadway infrastructure;
- Future infrastructure costs are just bound to go up accordingly;
- The most visible one is the traffic problem; the invisible one is the infrastructure deficit;
- We are subsidizing for lifestyles in the outskirts; this will translate into more expensive housing;
- Vehicle traffic is by far the worst; our services are way too spread out;
- There are transit requirements but the economics of sprawl (spread out ridership) are making it difficult to implement efficient transit service;
- The environmental impacts (greenhouse gases) of more vehicles on the road are critical considerations;
- There are “expectations of the location” in the outskirts; i.e. people move out into the suburban neighbourhoods and then want the services that may be available in the inner city, but because the economics (for these services) don’t work for many years, the demand for more and quality roads goes up, putting pressure in all areas of the city, including the farmlands.

In defence of wanting their land out of the ALR, many of the farmers, especially in the KLO-Benvoulin Block, suggested that agricultural lands in the inner fringe should be permitted for development (and help avoid further sprawl). Some of the statements offered were as follows:

- ...take lands out (of the ALR) in the inner city for urban development, and (instead) farm further out;
- The 'hot block' (KLO-Benvoulin area) should come out of the ALR and be carefully planned for development with higher densities than in the past;
- Sprawl is growing too rapidly; we see it being out here on the edge (South Lakeshore block);
- Sprawl is causing expensive farming;
- Go higher to 2, 3 and 4 storeys; this city is ready for it; don't keep building single family homes;
- Policies to go out into the suburbs are a means to avoid development of farmland, so we will just keep sprawling;
- The inner city must get into higher urban densities to avoid continued loss of agricultural land or face more sprawl;
- We must think strategically about planning our city; for example, the KLO/Okanagan College/KSS High School area should have been the hub to attract the UBCO campus, regardless of the ALR;
- There are too many homes going up into the hillsides and their sizes are not efficient nor sustainable; our aesthetics are also being affected;
- Develop the inner-city lands as services and roads are less costly to construct or are already available;
- Many lands in the ALR have a high-water table (especially in the KLO-Benvoulin block) and should not be held for agriculture;
- Yes, develop the inner-city ALR versus (allowing) sprawl;
- Develop the smaller lots in the KLO-Benvoulin block as senior's complexes and congregate care facilities; this land is flat and is strategically located near other compatible uses.

4.2.4 Planning in the Fringe – What is being done to Curb Sprawl?

It is important to provide a backdrop to this discussion before presenting the results of the respondents. It is understood that there are two main ways to avoid the sprawl and the urbanization of the fringe agricultural lands. One is to constrain the growth outwards with stricter enforcement of the ALR and attendant policies

and regulations. The other is to draw the incremental growth into the more urbanized areas of the city. According to the planners, this two-pronged approach is the current policy and regulatory framework that the City has recently adopted. It was pointed out by the planners and even some of the farmers that OCP policies were poised to curb sprawl in the past, but then “policies were removed, often, several times, depending on political views”, or that “the Councils of the day had not done a good job”, or “enforcement was not working.” Today, the City attempts to stand strong with tools such as the Urban Containment Boundary (UCB), noted as the Permanent Growth Boundary in the OCP. This primary method can provide a sense of permanency in managing growth in Kelowna. This tool, enacted through the Official Community Plan, does not supplant the ALR but in fact complements it. The planners noted that Kelowna is one of the only larger cities in BC that has incorporated this policy direction to curb sprawl and help avoid pressures on the ALR. The City’s Performance Indicators Review (2015) recently indicated that the tool is working very well, restricting building permits and subdivision beyond the UCB. However, some of the planners expressed concern that the UCB is partially responsible for the rampant land speculation within the UCB, largely caused by suppressing supply.

Besides the use of the UCB, the planners also offered the following suggestions for curbing sprawl into the inner fringe agricultural area and out into the suburban locations:

- More definitive policies regarding sewer extensions into the rural or suburban areas (are required);
- Strengthen current policies and enforce them;

- More use of Sector Plans/planning “to be able to drill down on the issues for particular rural-urban (interface) areas”, citing the fact that the OCP level of planning does not often suffice;
- Greater enforcement teaming with the Agricultural Land Commission;
- Respecting the Okanagan Basin Water Board contention that subdivisions less than one hectare should not be permitted in the rural areas.

In general, the planners felt that much more firmness is required to enforce their regulations, but that more policies are also required to ‘grow the city closer to the centre’. This planning philosophy has therefore led the City to strategize and incentivise future growth towards the urbanized areas and especially into the Urban and Village Centres of the city. The planners spoke about the new policy directions in the OCP that are just beginning to take hold. Besides directing growth into existing urban and village centres, the move towards encouraging densification has included: increased building height in many areas; introduction of different forms of housing to address density goals and design objectives; redeveloping inner-city properties; focused increases in densities by four times in many parts of the city; working with developers that are “leaving too much land for the long term and lower densities” after approvals are granted; supporting the micro-suite concept to address affordability while densification is also being achieved; and, more emphasis on making the urban centres become liveable and attractive communities.

Over the past two years, the City of Kelowna has launched an aggressive campaign to incentivize development in the inner-city neighbourhoods where increased density can be accommodated. This ‘carrot’ style of attracting the developments and investment into the inner city, has been supported by a changing economy (especially increased need for affordable housing), but the incentives

themselves are paying dividends. Without elaborating on the details, the City is using a variety of strategic initiatives including reduced development cost charges, reduced parking requirements, attracting major employment anchors, new zoning, streetscape revitalization, reduced application and approval times, along with major investments in the civic facilities and infrastructure that will complement private development needs, including new and expanded parkades.

Along with the general comments about why development should occur in the urban and village centres, the planners offered more opinion about how and where development could occur to avoid the suburban sprawl. Some of their statements pointed towards innovation in planning schemes and recognition of the market place: “there are several places to encourage infill, from compact single family residential lots to mid-rise buildings; a mix of homes to address demand from various demographics and new population; more carriage homes; five major areas of high density neighbourhoods will be coming on stream in the inner city; and, attention to design to accommodate the higher density buildings.” There were even statements that reflected the fact that perhaps both the City and the developers had been “leaving density on the table” regarding misdirected policies (e.g. some areas with carriage homes should have been zoned for higher densities) and developers often using up land at low densities (reflecting current market preferences) when they had zoning for much higher density forms of housing.

The farmers’ contribution regarding planning in the inner fringe was two-fold: (1) many areas developed in the inner city in the last two or three decades should have been built at higher densities. Some of these lands were former orchards and

taken out of the ALR to accommodate gated communities (at barely 6 units per gross acre). Considering their location near the agricultural block, 20% of the land could have been protected and devoted to farming while the remainder should have been built as higher density residential or mixed commercial-residential use. (2)

The interrelationship between urban and agriculture uses must be carefully planned. Although many of the farmers felt that urban uses could be closer (to agricultural activities), cautions were offered. Some of those cautions or observations included: “higher buildings could block out necessary sunshine; sprays/pesticides and noise (from agricultural activities) can go as high as five storeys; more focussed and definitive planning on the urban-rural edge; land must be looked at on a comprehensively planned basis as well as on a case by case (parcel unit) basis.” They felt that the poor agricultural land should be considered for greenhouses, and even going to higher densities to avoid building out into the south slopes in the form of sprawl.

4.2.5 Farming Practices and Ability to Farm in the Inner Fringe

An important debate, central to the conflict between agriculture and urban uses in the inner fringe has been about the ability to farm in a location where farming practices may be affected by urban influences. The concerns by farmers are often the cause, or excuses, cited to file applications to have their land subdivided, excluded (from the ALR) or used for non-farm use. Some farmers suggested that the planners recognize this potential conflict, but admittedly deny the fact that farming is being compromised by adjacent or infiltrating urbanization.

The farming community from both study areas had varying perspectives; those that had speculative interests indicated that their land was “poor or was challenged by the soils or the effects of urbanization.” The other faction that reported they were committed to farming in the inner fringe believed that with the right farming knowledge, you could make it work. These were also respondents that stated: “if you understand that the land is never coming out of the ALR, you just make it work.” These respondents felt that the surrounding urban uses should not stop most crops from being grown in the area. The following statements are indicative of the various perspectives depending on ‘ability to farm’. Those who are non-supportive of the ability to farm in the inner fringe expressed a range of rationalities:

- Agriculture (status) has been compromised due to land use conflicts, access/egress, movement (with tractors) between farmlands (that he leases) in the same area;
- The (adjacent) industrial and institutional uses are not compatible with my farming operation;
- The large hedge row that had to be planted (urban-rural buffer) adjacent to the farm does not allow my strawberries to ripen fast enough in certain locations (citing reduced sun exposure and air movement);
- We are restricted to when we can spray with the school next door when fields are in use during the week and even on weekends when children are having tournaments;
- I would not be able to carry out a much larger farm operation or farm many other products due to the proximate uses; there are complaints of spray, odors, bird bangers, etc. all the time;
- It is a small farming area almost surrounded by encroaching urban uses;
- The City permitted the non-compatible uses next door, now we are suffering for it;
- The traffic conflicts between farm equipment and commuter traffic is becoming a real problem;
- Roads have been constructed right through the property; these are collector roads with median and boulevards that carry large volumes of traffic that cause constant pollution;
- Trespassing by non-farm users, including dog walkers has increased along with the increased urbanization in our area;

- Although we try to practice the “most neighbourly” approach to our farming, the eyes (of the urban residents) are on you constantly; and, “the urban neighbours are winning the battle”;

Besides concern directly attributed to urban influences, the farmers especially in the KLO-Benvoulin block, raised the following:

- the draw on water to service our needs is challenged in this area;
- the mono-culture farm operations are becoming a real concern;
- the quality of the soil is not good in many parts of the Benvoulin corridor;
- farmers in the past “killed the soil” because of lack of farming knowledge;
- the Food Safe regulations are making it too difficult for small local farmers to survive;

Support for farming in the inner fringe included statements such as the following:

“urban uses should not stop certain crops from being farmed in these areas”. This thought was presented by a very experienced farmer and one that had served on the AAC for many years. Others advocated that, “... (the need for) high intensity farming production will be critical in the near future; and agri-zoning (by crop type) could be dictated based on need for those types of crops and ability to achieve compatibility between urban and agricultural uses.” Others made statements that held out hope for the inner fringe lands for various other reasons: “if there is commitment to farming (including lease to farm), land will be protected and not compromised by urban uses; there is a lifestyle change happening now; people live differently and we can have the two uses work well together; all lands in the city have the potential to be used to feed the City’s population; and, the proximity to market is a huge benefit to farming in the inner fringes.” An experienced farmer summed it quite well by stating: “Many farmers in the ALR (in the inner fringe) will continue to not use their land for farming, or very little of it, just to get their farm status for tax

purposes...most of the land will continue to sit idle for many years especially if adjacent to or close to urban uses...nevertheless, urban uses should not stop certain crops from being farmed in these areas.” This assertion was backed up by another farmer that leases land throughout the Central Okanagan: “we can farm it, but we must be much smarter today than in the past”, and “there are far too many restrictions that do not support the farmer today.” Finally, “the amount of outside (Alberta, Vancouver, etc.) home owners that have bought big homes in and around the agricultural area don’t really care about their impact on the nearby orchards, and this will always be a limiting factor for the farming community”.

4.2.6 How to Encourage Farming in the Inner Fringe

Based on the premise of the above noted findings, which led the researcher to believe that there is significant hope for the inner fringe lands to be farmed, the important question becomes, “how can farming be encouraged in these fringe locations; and what can be grown in an otherwise constrained agricultural land area?” This notion of the potential to farm within an urban environment is currently growing beyond expectations nation-wide, albeit at different scales of farms, but find a resurgence based on many fronts. Besides the literature noted in the earlier sections of this paper, recent accounts of support for growing food in the city, continue to claim that urban agriculture is vital to the enhancement of food security, food sustainability and perhaps, food safety. A recent publication produced by the U.S. John Hopkins Centre for a Liveable Future stated: “urban agriculture could increase social capital, community well-being, and civic engagement with the food system” (Santo et al, 2016). The Suzuki Foundation reinforced this sentiment by

adding that urban agriculture can “enhance food security, provide ecosystem services, improve health and build residents’ skills...” (Suzuki Foundation, 2016). Peter Ladner, former City of Vancouver councillor, journalist, and a David Suzuki Foundation board member, in his recently highly acclaimed book, *The Urban Food Revolution: Changing the Way We Feed Cities*, offers the following: “When urban agriculture flourishes, our children are healthier and smarter about what they eat, fewer people are hungry, more local jobs are created, local economies are stronger, our neighbourhoods are greener and safer, and our communities are more inclusive.” (Ladner, 2011 in Suzuki Foundation Blog, Aug. 2016).

In response to the two pointed questions about how to encourage farming and what crops or farm products can be grown in the inner fringes, the farmers offered many ideas. Some were based on their direct farming experience while others stemmed from their understanding of the local policies and farm economy. In some cases, their responses applied to overall farming practices, not just at the specific geographic area. An overview of those ideas follows, with the first part directed at government factors: “Some means of encouraging farming require access to government grants such as replant programs and (income) food stabilization; the tax regime for farmers needs to be modified; small subsidies (are required) to assist with things such as farm equipment, fencing, urban deer problem and (crop) loss insurance; and address the bureaucracy of City Hall.” Other comments were directed at the business acumen of the farmers: “farmers are entrepreneurs so let them succeed and prosper, commercial type enterprises are ancillary to farming (some of this sentiment was directed at agri-tourism ventures and retail (sales)

associated with the farm); more creative use and diversity of farm activities to make the operation viable; landowners must understand/learn about what can be farmed in these areas; and ...community gardens that are well managed by people that know what they are doing.” Otherwise, the comments related to their extensive experience of farming in general: “understanding of what can be grown in the intensive farming areas; growing fruit trees can be very different than growing many (ground) crops; sizes of plots must be large enough to allow for crop rotation; greenhouses are a must in this region; security of water; the Irrigation Districts are now being challenged with takeover by the City...the City’s priority will be the urban population; we need more/better irrigation water supply.” Concluding remarks related to the protection of farming as an industry: “promote the importance of the farmer and their farm; in many other countries the farmer is respected, but not in Canada; use a form of zoning or legislation to protect the (type of) farm use in particular areas, “we manage fish, but not agriculture”; land bank to allow more young people to be able to get into farming at reasonable price, affordability will be the main motivation to farm locally; and lastlysmaller hobby farms are needed (to support the future of farming).”

At least one landowner refused to answer the question as he was a pure speculator and did not support any encouragement of farming in the KLO-Benvoulin block. Another landowner that had both development background and speculative interests in the same area questioned whether urban farming was even appropriate in this area of the city, and that “speculation is the main use” in this corridor.

Following up on recent findings by both academics and government officials, business cases for small high intensity or high yield farms are being made in BC. Specific studies conducted by agriculture specialists such as Dr. Kent Mullunix, adjunct professor at the UBC School of Land and Food Systems and Director of Kwantlen University Institute of Sustainable Food Systems, suggests there are several high yield crops that can be grown to sustain a viable business. Many of those that were interviewed were bullish on the opportunities presented by small, high intensity farms, but there were just as many cautions presented by those interviewed. Some of the many supportive ideas and opinions offered were as follows:

- Most certainly, many crops can be sold fresh (so that the packing plants that shut down years ago are not required);
- Tomatoes planted at high density can provide a good (financial) return; one acre will support 5000 plants and produce over 20,000 pounds; (internet search suggests this is low)
- Parsley is seeing big demand by chefs in the Okanagan;
- Sysco Foods is always buying local foods, especially vegetables;
- Niche market demand – Urban Fair will buy any specialty product, that others may not carry e.g. heritage apples;
- Dill pickles are high density producers but labor intensive;
- Specialty table grapes, blueberries and blackberries;
- Small animal husbandry such as goats;
- Speciality vegetables such as organic baby bok choy, kale, garlic, horse radish, sugar beets and sugar grain for craft breweries (a growing industry in BC);
- Fennel;
- Hops can work in this area, but need well drained soils;
- Celery (in wet areas) were once a major product in Kelowna.

Farmers also suggested the following opportunities and conditions that will support feasible crop production in smaller farming ventures next to urban areas in

Kelowna:

- No tractors are required/no major spraying like orchards require;
- High cost of living translating to trying to keep (food) costs down;
- People want local (foods) and diversity;
- Growth in farmers market attendance/consumers;
- Interest to buy all kinds of products that were grown here in the past;
- Farmers are smarter, getting their soils tested for what can be grown;
- Seasonal eating habits of consumers;
- Don O Ray, My Country Garden and Wise Earth Farms along with other new farmgate outlets/markets are examples of successful models.

Some insightful opinions about farming as a business were as follows:

- Our “fresh produce” list is going out to the restaurants on a regular basis;
- Wisdom is needed in the farming community;
- Don’t just grow high yield products, be diverse;
- Farmers Market serves as an excellent communication conduit for the farmers;
- Lots of opportunities if you are prepared to work hard;
- Kelowna has too many farms that are too big (for intensive crops) and the owners don’t know how to farm high density and organic crops;
- I have tried potatoes, onions and corn but even with heavy watering it did not help on my land;
- Only up to 5 (or maybe 10) acre small plots would be good for high yield crops;
- The market is only so big in the Central Okanagan.

Once again, one landowner who identified himself as a speculator advocated that the land is not good enough for small lot/high yield crops. However, during the summer after the interviews were held, this landowner leased a portion of one of his holdings for exactly that use. It is not known how successful the operation was. As one of the more successful small lot farmers (in the KLO-Benvoulin block) indicated, “Care must be taken that small farms are not just wealthy, entitled landowners; they are not real farmers. They are speculators and they are subverting agricultural potential due to having other intentions.”

4.2.7 Small Lot Farming Potential

The literature cited in Section 2 confirms that there is a strong resurgence in the local food movement across the country. The literature further supports the fact that agriculture and urbanity are inextricably linked, and this phenomenon is occurring or trying to occur in the immediate vicinity of cities, on urban edges, on the rural fringes, in back yards, in community gardens, and even on roof tops. Besides the potential demand for small farm lots, the Kelowna situation has also raised prominent issues such as land speculation in the inner fringe ALR; agricultural lands left fallow or under farmed; barrier to entry for young and new farmers; discord between senior government (top down legislation) and local government (planning and development controls); and leapfrogging forms of sprawl development. It is these types of issues that lend further credibility to investigating the potential of small lot farming in the rural-urban fringe, in addressing these issues and potentially satisfying demand for small lot farms.

The topic of small lot farms was discussed with all three interview groups: the city planners, to gain their perspective on policy and regulatory direction; the farmers, to understand their perspective on potential relative to farming practice; and the developers, to gain an appreciation for their perspective on general land use and economic/business suitability within the city.

Planners

The planners' feedback suggested a negative response or at best, issued caution towards permitting small lot farming in the inner fringe. This attitude reflected a concern for further fragmentation and ultimately the farming reverting

to simply residential use, when 'farming no longer worked for the landowner'.

There was also hesitation about the demand for small lot farms, noting that there are already enough small lots (less than 5 acres) and that they are not being used for farming. Justification about their concern for creating small lots was made obvious through statements such as the following:

- Do not create any more small lots until demand warrants (a planner was not aware of the current demand by new/young farmers that may have expressed interest in such farming practice in or around the city);
- The house footprint on the lot is always a concern;
- Leasing of the land is the best option; no legal subdivision should be permitted;
- Making residential a secondary use on farmland would be a good approach but already deemed to be too late in Kelowna;
- Do anything possible to reduce the speculation on the farmland;
- Strict regulations would be required to ensure that farming is going to be the principal use (on that small lot);
- The current situation in Kelowna is not working; farming in the city is an afterthought;
- The single-family use should not be permitted at the beginning; owner must prove out the farm first (respondent cited examples of regulations in the USA);
- Regulations would be imperative to make the concept of small lot farming work in the city;
- A different approach is necessary; speculation is running rampant;
- Small (farm) lots may be appropriate to allow transition of uses between urban and the large agricultural/orchard operations;
- There should be a (new) break on assessment for what they would be doing with a small lot farm; current farm status taxation does not work where there is speculation of the land;
- Incentivize the small farmer but also regulate to avoid the negative outcomes;
- Taxes from development should go back into farming (programs) and not just to service more urban development; but we are at cross purposes with what a city is all about (urban development);
- We must impose more "pain" to the speculators;
- Keep the parent parcel intact;
- Use more definitive zoning but must be in compliance with Right to Farm;
- Use of land trusts, community farms, allotment gardens (as in Germany), but not simple subdivisions;
- Decisions about small lots should be made by the ALC and not the City.

Farmers/Landowners

The farmers offered much more support for small lot farming than the planners, albeit with some conditions too. Interestingly, the support came from both conventional farmers and those landowners that leaned towards speculative interests. Some of the key reasons for the support were as follows:

- I strongly support it; it would be an opportunity for young people to try farming for a living;
- Selling some farmland would help the (larger) farms;
- You could designate areas for certain crops that could be grown on small plots;
- There are some orchardists that have switched from tree fruits to crops that are making it work just fine;
- Farming is certainly feasible with small plots;
- Yes, good idea to support small plot farming because individual owners do their own thing and there is diversity in the product;
- The more farmers the better; we need all kinds of produce;
- A smaller lot is fine for farming but only without a house on it;
- There are highly productive lands in the city that can produce a variety of crops;
- Small plots for high density urban areas makes sense;
- Permaculture could work in the inner fringe; use of some animals integrated to get more nutrients into the soil;
- Farm stratas could work, leased or not;
- Yes, there is viability in the local food movement;
- There are many different ways that this could be done;
- Connect landowners with aspiring farmers; there are many young people that want to farm;
- Organic growing would be much more acceptable in the inner fringes;
- Introduce ground crops/vegetables instead of tree fruits/orchards alongside the urban uses;
- Small lot farms can help rid city of sprays that are known to create health problems in an urban environment;
- Ground crops only, as drip and misters will be compatible with surrounding urban uses (and not need booms for watering);
- Greenhouses might be feasible;
- 5 to 7-acre farm would be most feasible;
- “Farm fresh” and farm to table concept is doing well in Kelowna;
- Chefs buy local because “farm fresh” tastes better;
- Basil and garlic are good opportunities for small lot farms;
- Yes, there are many farm options that make sense.

Those farmers/landowners that offered caution or conditions made statements such as the following:

- Use of water can be better managed in small farms;
- The City could implement incentives for small lot farming;
- There is a need for agricultural resources/personnel; if government cannot afford such (professional/technical) assistance to the small farmer, then possibly use university support;
- Much of the land in the KLO-Benvoulin block is in the hands of the wrong people; if they are good farmers that know what they are doing, they can do a great deal to enhance farming in the area;
- Change the legislation to assist in small lot creation in the right areas;
- Must understand how to make the economics work for the small farmer;
- Small farmers may need to be subsidized to get started;
- Use of allotment farms designated to the housing units in the area;
- Concern for the market getting saturated with small lot producers as the demand in the Kelowna area can only absorb so much produce;
- Cost of farming is getting too expensive (e.g. Roundup and fertilizers, etc.);
- Economics will work for many crops but not all;
- Farms in the 10-acre range are too large and not small enough (for small lot intensive farming);
- Long term leases are what many farmers are looking for, but the speculators don't support it as they want to sell their land as soon as possible;
- Land banking is needed; we are too short sighted.

A farmer with extensive experience and from three generations of farm family in Kelowna, summed up the general attitude and hope for small lot farming in the city: "In order to make something like this (small lot farms) work in the City, we need a champion for it. The type of people you see on Council is often indicative of the limited support for agriculture; Robert Hobson (long time Councillor and Regional District Board Chair) was the last person that had a real feeling for farms/farmers/food security."

Developers

The developers provided a business sense to the discussion of small lot farming. They offered the following insight, first about support, but then more importantly, regarding critical observations, and then with ideas for implementation. Statements of support included, “Yes, I support the notion of small lot farming, but I am not sure how much the market can bear here in Kelowna; I support the concept as a transition between large scale farms/orchards and urban area; and, ...if there are enough small farms perhaps the economics for storage could work just like the packing houses of the orchard industry, then they can ship out of the region.” Critical statements and observations included: “it is unfortunate that the ALR/ALC only protects the land and is not an integral player to the business of agriculture; if you can’t do tree fruits, then don’t do tree fruits; agriculture has never been identified as a core need in the City, (the respondent made reference to the many ALR lands that were excluded, e.g. Mission Sports Fields, Wastewater Treatment Plant, UBCO, and huge subdivisions); people that want to become ‘gentlemen farmers’ cannot do it due to minimum parcel size requirements; shipping is getting easier to move food around the world, meaning that imports will be easier, so (I ask) can our local producers compete with foreign/imported food?; in 20 years, we may not be sustainable with farming our own local products.” With regard to ideas for implementation, the developers presented statements such as the following: “try bare land strata for farming operations, should not be just fee simple for subdivision; find other ways to get the farmer to get access to the farmland; we should mimic practices in Cuba and Europe, [such as] small lot organic

farming, small lot farms and villages with [farm] allotment units; support zoning for farm categories (as suggested by some of the farmers); allow animal husbandry near urban areas; help farmers get their produce to market, they understand how to produce it but getting it to market is often the challenge for small farmers; perhaps the perimeter of the ALR block can be used for small lot farms; the interface is not working, for example, sprays going on to urban/residential areas, but can we avoid the use of [pesticide] sprays?; small lots may provide many advantages over the large orchard-type operations, but residents like to drive by the fruit trees (blossoms, colourful fruit, etc.); and, ...practical planning is required at the local level to make agriculture work within the City.”

These developers (some with farm/ranching backgrounds) provided an interesting insight that reflected the conclusions of the literature review on the topic of small lot versus fragmentation. Although it has been shown that small lot farms can be successful, the challenge of reconciling the fact that small lots can lead to fragmentation of the agricultural land base is still prevalent in places such as Kelowna. The developers came to the same conclusion as the planners and farmers about trying to avoid subdivision and therefore devote more attention to alternative land access and tenure. This direction assumes a community based farmland management approach that calls for both sustained and accessible land base as well as continuing generations of farmers to farm the land, as prescribed by Dennis and Wittman (2014).

Another insight produced by this group that reflects the academic literature is the need to endorse the integration of agriculture in land use planning. Seeing that

the top down form of legislation such as the ALR may not be working within cities such as Kelowna, there needs to be other creative approaches that require sincere and effective communication amongst all parties that are involved. As one respondent who is a long-time rancher and developer in Kelowna offered:

“Communication is critical. The situation must be looked at creatively; the top-down legislation does not really allow for communication to find creative solutions...half measures are not helping, and the ALC is considered a half measure in my mind.”

4.2.8 Development Trends and Economics of Development in Suburbs

Sprawl and disorder in the rural-urban fringe due to leapfrogging of the ALR is an important issue to understand in the study area. Condon et al (2010) confirm that sprawl caused by leapfrogging of protected agricultural land has resulted in “pockets of both active and undeveloped farmland between suburban areas.” Although it is generally accepted that the inner city ALR in Kelowna has influenced the leapfrog development into the outlying hillsides, it is also understood that the suburban developments have been a ‘vent’ to relieve pressure of urbanization on the ALR. Nevertheless, the City of Kelowna contends that the suburbs will continue to be in demand regardless of the ALR blocks within the municipal boundaries. For this reason, it was deemed important to gain an understanding of the development trends and the economics of suburban development in Kelowna. The insight from the developers that participated in this study confirmed that the housing market will continue to support the suburban locations, regardless of whether it is deemed

sprawl or not. Developers interviewed expressed the following trends in demand for suburban housing:

- Definitely, there is huge interest for suburban living in Kelowna, even if inner city housing was available at a lesser cost;
- The demand is not just from out of town buyers, but it is coming from people that live in Kelowna that are moving up in the market (e.g. larger families);
- People want to invest in 'new' ...homes, appliances, etc. and consequently go to the suburbs where this kind of lifestyle and product is available;
- It's really about the views; serviced lots are going for (early 2016) \$200,000 to \$800,000 depending on the view, and people are still buying;
- We are in a market where people want suburban lifestyle;
- People that are moving into Kelowna do not see suburban living as an impediment; traffic, distance to services and amenities is not an issue for them;
- Although affordability for single family residential is certainly becoming an issue, we can be price competitive out here (suburbs);
- We are building with dynamite, so costs will go up to reflect challenges of construction in these hillsides/mountain locations, but for what the buyer is getting (large home), he is still prepared to pay;
- Buyers want a piece of dirt, even with the townhouses (freehold versus strata);
- Buyers want the suburban lifestyle but little or no maintenance is a priority in the new market;
- Many customers don't even use the bottom floor of their homes; these are the 'downsizers' that are buying 2,500 square feet homes at approximately \$450,000 and up;
- Yes, we are selling big time; anything removed from the city urban area centre is in demand;
- Many of these new hillside developments are (relatively) close to services and amenities but residents still get their privacy;
- Views and aesthetics are what people are buying;
- Larger lots are helping sales; people want some land around them and the ability to build a larger home;
- The family will live in the suburbs, and perhaps the younger or older demographic will consider the inner city.

Economics of Developing the Suburbs versus Inner City

To get an appreciation of how the suburban real estate is selling versus the potential for the product in the inner city, the developers were asked to turn their attention to the economics of development. This is especially important as the

demand is shifting for housing product due to changing demographics, need for affordability and lifestyle preferences. Consequently, the questioning focussed on not only the cost of doing development but for multiple-family residential product that could help increase densities and possibly limit the amount of sprawl. The responses were sincere and offered insight for the challenges of providing sustainable housing product while respecting the need to build a liveable community. Again, it should be noted that these are developers that each have approved development plans for several hundred to over 1,000 residential units.

Statements made by the developers included the following:

- In recent years, lot frontages went up 25% in width due to demand for larger homes; since the mid-range type of homes are not available, we started to try some smaller lots, 10-11 meter frontages, (which caused price points to drop and density to rise). This single family detached home helped attract the younger market to move into the neighbourhood. Nevertheless, the mid-range lots at approximately 60 feet (18 meters) were difficult to sell, so we went to the 70-foot (21 meters) lot which were in more demand due to the ability to (still) afford the product and wanting to accommodate their lifestyle (bigger home/bigger lot).
- If the lots were at 10 meters, they could be sold closer in to the city centre.
- The developer tries to create a sense of community with a golf course, ice rink, community events, but then this helps dictate the (higher) price of the home.
- Based on the cost of the infrastructure, hillside development is becoming costly and we will have to pass that on to the consumer.
- The larger the chunk of land, the more flexibility there is in the housing forms; this is not possible on a small parcel in the inner city for example.
- Multi-family residential (MFR) is often difficult to achieve on the hillside topography.
- We have many areas of designated and zoned land for MFR housing, but the market is not quite interested as people want services, amenities, etc. that will not happen until we get a critical mass of population. It's a catch-22 as to what comes first.
- MFR will not happen in the outlying areas until services are available for the older demographic; in the meantime, the older population is buying in the inner city/villages throughout Kelowna.
- There is no 'thirst' for speculative Multi-Family Residential (MFR) construction; and speculative construction has just recently begun again in the Single Family Residential (SFR) market.

- Development Cost Charges (DCCs) are at \$33,000 per lot for roads and services, but demand warrants the lower density. Nevertheless, the cost is being passed along to the taxpayer and the lot buyer.
- The economic efficiencies are achieved where services are already located; we can only get those efficiencies in the suburban developments where the land is cheap. As the abundance of land dries up, the efficiencies will be lost, unless we can put in more MFR....or costs are subsidized by government.
- We are going through a transition phase where some of the lower density MFR is slowly starting to work. Also, the younger demographic is looking for the “in-between” housing product, and we will need to start building (and getting the municipalities to support) what the new market demands.

The summaries offered by all the developers on this topic were profound and reflected an understanding that inner city development will need to satisfy much of the future demand, along with the suburban areas. One of the most senior members of the development fraternity in Kelowna stated the following: “Lower income people need to be near their jobs and bus routes, not out in the suburbs; this reality is going to make it very challenging for lower end of the social strata as the cost of housing just keeps going up, both in the inner city and in the suburbs. Even the redevelopment areas where affordable housing once prevailed will attract new housing that may not be that affordable for a certain segment of the buyers or renters.” Another respondent with close to 40 years of experience in the land development industry, including multi-family, single family and commercial projects in Kelowna, offered: “Green space does not have to be in the form of a yard; just next door or close to an amenity such as the downtown or a large recreational amenity.” Finally, one of the developers, with international planning and development experience, simply explained his sentiment as follows: “There are no views in the inner city, so today we can compete (with our suburban sites); but soon you will get them (views) from high rise buildings in the inner city.”

4.2.9 Potential for a Blend of Agriculture and Urban Uses

This last theme reflects the ideas of authors such as Caldwell (2002), Condon (2010), and Miller (2013), in that a mixture of farming and residential development can co-exist, or that farming can be more proximate to urban uses than many of our planning policies and regulations will support today. Others such as Clarke (2014), Jackson-Smith and Inwood (2008, 2012) have further expressed strong sentiments that the traditional farmland preservation tools can not necessarily support the new food systems goals, and that in some cases, traditional land use policy tools can create barriers to emerging forms of exurban agriculture. For example, zoning often prevents farmers from developing value-added urban-oriented businesses on their farms that would otherwise serve urban markets. Is it possible that the answer lies, in what Condon and several other scholars have offered, that is, “envisaging and building a municipal-focussed agriculture sector in which agriculture and urbanity are inextricably linking via planning and economic strategy” (Esseks and Condon, 2010, p. 105)?

Considering what is happening in Kelowna’s inner fringe ALR lands, especially the speculation, idle farmlands and the disorder, along with recognized urban sprawl in the form of leapfrog development, the respondents were asked about their opinions of the potential to blend agriculture and urban uses, and even use some of the inner city ALR lands (at higher densities) to help avoid sprawl. Most respondents qualified their answers by defining the type of urban uses and conditions that may be appropriate close to the agricultural lands.

The following are comments mainly offered by the farming community:

- Many of the residential developments that were released from the ALR should have been developed to much higher densities; it was a waste of good farmland (e.g. Missionwood);
- If any land along the edge is to be released (from ALR) in the future, 20% should be protected and devoted to farming;
- The edge could be mainly high density urban but all should require (real) community gardens;
- Large gated communities that were developed on the edge of the ALR should not have been at such low residential densities (only 5.71 units/acre); (Figure 4.1)

Figure 4.1. Land on the Edge of the KLO-Benvoulin Block (Gated Communities) Developed at Relatively Low Density for Residential Use.



Source: Google Earth

- Although I agree with increasing (residential) density along the edge, I caution about impact on agriculture (e.g. concern for sprays, noise and blocking of sunshine);
- I support mixed use (commercial and residential), but there must be some agricultural land protected for the immediate residents;
- Any lands targeted for development must be comprehensively planned, including provision for buffering;
- I support mixing agriculture and urban uses but it must be master planned;
- A comprehensive plan that allows carefully selected mixture of uses is what we absolutely want;
- Take lands out of the ALR in the inner-city for urban development and farm further out;

- The hot block (KLO-Benvoulin) should come out (of the ALR) and be carefully planned for future development; I am afraid individual parcels will be released and developed separately without a comprehensive plan for the area;
- The traffic on Benvoulin will eventually dictate changes from rural to urban uses;
- The KLO-Benvoulin block would be ideal for special needs housing, a new BC Children's Hospital, recreation facilities and other institutional uses that have to be close to the inner city;
- We tried a very intensive urban development proposal that the city supported but the ALC determined it would not be compatible with the remaining agriculture in the area;
- Residential pattern of development should continue from the Quarry (adjacent to ours) but some protected area in the form of a park or open space should take up approximately 20% of the land (Figure 4.2).

Figure 4.2 Residential Development encroaching on South Lakeshore ALR Block causing expectations for urban development.



Source: Photo: E. Grifone, 2016

The two strongest opponents to agriculture in Kelowna were in the KLO-Benvoulin block. One noted that urban farming is not even appropriate in this area of the city, suggesting that speculation in this corridor is the prominent use and unless something creative is done, lands will continue to sit idle. The other was an

advocate for using the extensive parcels of land for major public uses that may be required in the future. That respondent suggested that uses such as the University should have been located closer to the inner city and avoided the threat of having to eventually expand onto (good) ALR lands where it is now located.

With regard to removing land from the inner fringe ALR for urban uses, the responses included the full range from not allowing any urban encroachment to total exclusion with a comprehensive plan for the future. Although there was an understanding that the speculative values would continue to climb with or without exclusion, the attitude that prevailed was to look at the area comprehensively. This would include more definitive (fine tuning) plans to determine where some land might come out (of the ALR) for reasons such as areas of poor quality soils, or farmland that has been compromised due to incompatible uses on adjacent properties.

5. Findings from the Spatial Empirical Research

5.1 Purpose of Empirical Research

This section presents findings from the quantitative analysis which primarily establishes a foundation of empirical evidence about the agricultural uses and the surrounding urban uses for both study blocks. Secondly, the results of the ‘density test’ are presented to help describe how various forms of residential development and density patterns affect the consumption of land.

5.2 An Overview of the Study Blocks

Two key ALR blocks in Kelowna, BC are used as study sites and have been instrumental in defining the problem. The KLO-Benvoulin and South Lakeshore ALR blocks are excellent representations of the dynamic between the forces of urbanization and the regulatory framework of agricultural land preservation in BC. The results include rampant land speculation, land use disorder, idle farmland, and land masses that may be causing residential sprawl due to leapfrogging. The two study blocks also clearly illustrate the pressures being exerted on the urban side of the edge, including the growing ‘urban core’ (in the case of the KLO-Benvoulin block) and the encroaching single family residential subdivisions (in the case of the South Lakeshore block). Furthermore, the pressures of urbanization are apparent within the blocks as well as along the edges. The South Lakeshore block presented a different face than the KLO-Benvoulin block. The South Lakeshore block has experienced residential subdivision encroachment immediately up to most of the edges, while farming has occupied more of the land base in the block. Two prominent uses were vineyards and cherry orchards that consumed much of the

block. Furthermore, value-added production was more prevalent in the South Lakeshore block. The KLO-Benvoulin block, has experienced urban encroachment within the block, especially along the main collector roads.

5.2.1 Urban and Non-Farm Uses

A review of land use maps confirmed the urban and non-farm uses that are behind the threat of urbanization in the two study blocks. This review revealed that the urbanization pattern has been occurring from the outside edges as well as inside the ALR in some cases. In the case of the KLO-Benvoulin block, the uses within the adjacent City core are a mixture of commercial, high and low density residential, mixed use and institutional developments including major schools and churches. Internally, some areas have been permitted to continue the urban development pattern that was started well before the introduction of the ALR in the early 1970s. Furthermore, three major roadway expansions have caused loss of ALR and potentially attracted non-agricultural activity along those corridors.

The land use pattern related to the South Lakeshore block is the encroaching single family residential subdivisions. The land use maps depict the immediacy between the current edge development and the agricultural operations. Furthermore, there is a indication of local streets and municipal utilities that appear to lead directly into the ALR, as potential future phases of the residential subdivisions.

5.2.2 Suburban Developments

Details that describe suburban neighbourhoods in the city are gained from current land use maps, the OCP and Zoning maps (input from the respective developers that own land in the outlying areas of the City was also noted in the qualitative findings.). This review provided an indication of the housing typologies, residential density patterns, available land and zoning schemes that are being used to develop these relatively new neighbourhoods. These are areas that are removed from the inner city and considered by some to be an indication of urban sprawl largely attributed to distance from services, amenities and places of employment, and low density patterns of development.

5.3 Agricultural Land Use in Kelowna

The agricultural land use situation in Kelowna was derived from a review of data from three main sources. A brief overview follows, and then more detail is applied in Section 5.4, when discussing the findings for each of the blocks. The sources used were:

- The Agricultural Land Reserve and its Influence on Agriculture in the City of Kelowna (A Review from 1973 to 2006), Ministry of Agriculture and the ALC, 2008
- The City of Kelowna Agricultural Plan, 1998; along with the CLI Map
- The City of Kelowna Official Community Plan (Kelowna 2030), 2012

5.3.1 ALR and Its Influence on Agriculture in Kelowna

The 2008 report produced by the Provincial Government is the most recent authoritative document for Kelowna that addresses agriculture as it relates to the ALR and applications pursuant to the ALC Act since its inception in 1973. Statistics

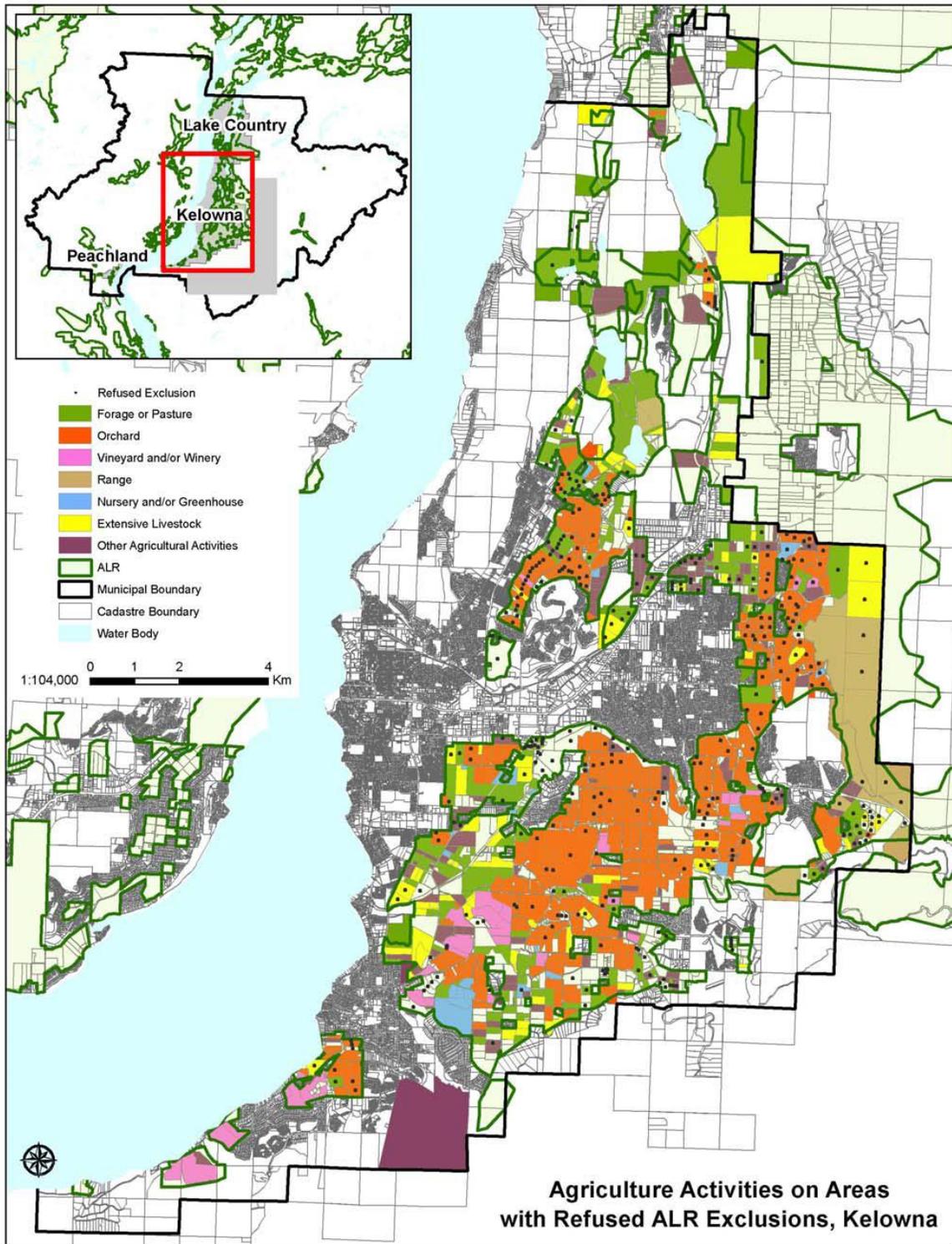
on land use inventory calculated using GIS (Province of BC) show that out of 21,656 ha. in Kelowna's jurisdictional land area, 40% (8,751 ha.) is within the ALR. In 2001, the Province determined that 6,319 ha. were being farmed, which is approximately 29% of Kelowna's land mass or 73% of the ALR base. Between 1973 and 2006, 1,300 ha. were excluded from the ALR, resulting in a loss of 13% of the original land area in the ALR (Ministry of Agriculture, 2008). The rate of loss was claimed to be approximately 43 ha. per year over the 30-year period. The document also illustrates that if all exclusion applications during that period had been approved, there would have been a 37% reduction in the ALR. (i.e. reduction of 6,384 ha. from 10,054 ha. at designation or 8,751 ha. when measured in 2007).

The document further summarizes the types of agricultural activities that were occurring on the properties that were refused for exclusion. The largest of the total amount applied for exclusion was made up of orchard land accounting for 852 ha. (149 parcels), or 48% of the total area refused. These potential losses were translated into an estimated annual value for agriculture, with orchards alone accounting for an annual crop value of over \$4 million. Lastly, the report tries to convey the message that the Kelowna landscape would have been significantly altered if those lands (say in east Kelowna) would have been developed at the same low densities as an adjacent residential area. Although a somewhat simplistic planning and design model, it describes the reality of sprawl without controls such as the ALR.

Between 1973 and 2006, the applications for exclusion from the ALR occurred within many contiguous, and non-contiguous ALR blocks including the two that are

the subject of this study. Since that time, the forces of urbanization have been mainly exerted upon the inner-city fringe areas that led to the planning challenges found in this study (Figure 5.1).

Figure 5.1. Agricultural Activities on Parcels with Refused Applications, Kelowna



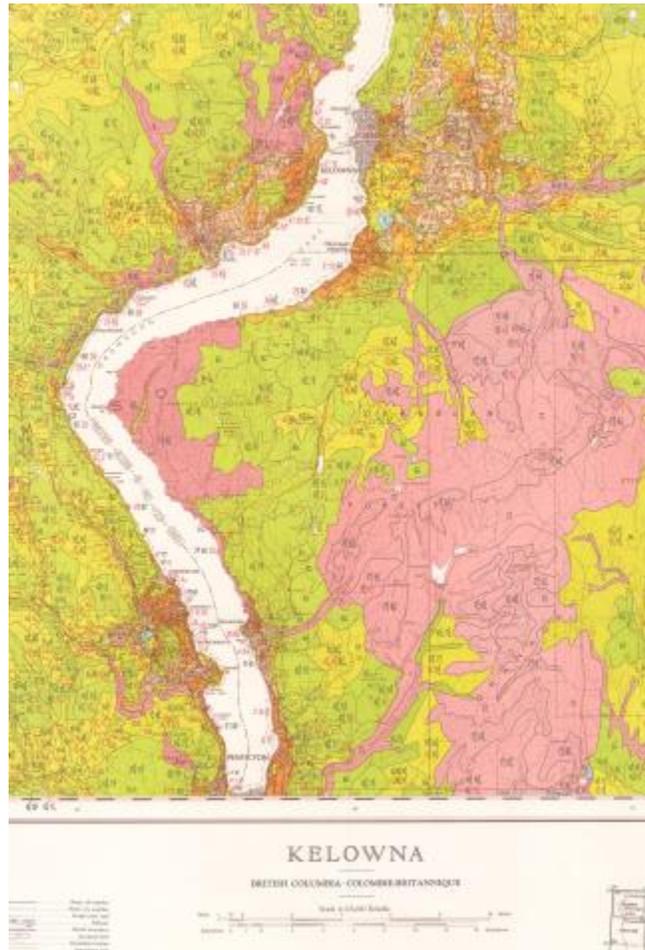
Source: Ministry of Agriculture, 2008, p. 9

The City of Kelowna Agricultural Plan further defines the type of activities that support the agricultural industry in the city, and the many factors that contribute to the opportunities and constraints of conducting an agricultural business in Kelowna. I cross-referenced this information with the CLI ratings using the 1:125,000 scale map (Figure 5.2). This source and scale of mapping is the only known resource to understand soil capability for agriculture in the two study blocks. The CLI is briefly explained below.

5.3.2 Canada Land Inventory (CLI) for Agriculture

An important spatial land use element of the ALR is the 'Canada Land Inventory (CLI) for Agriculture' classification of soil capability. This was a key criterion used in the creation of the ALR in the early 1970s. The classification system dates back to the early 1960s when the system was developed by a combined effort of Provincial and Federal governments, and continues to be used by the Agricultural Land Commission as the main determinant for the inclusion of lands in the ALR, and in reviews for potential 'exclusions' of land from the ALR. A simplified explanation of how the system works follows. The proportionate mix of the various soils classifications is then explained for the two study blocks (Sections 5.4.1 and 5.4.2).

**Figure 5.2 Generalized CLI Map for Kelowna and Area,
1:125,000 scale**



**Source: Agriculture and Agri-Food Canada,
Government of Canada**

(http://sis.agr.gc.ca/cansis/publications/maps/cli/250k/agr/cli_250k_agr_82e_nw.jpg)

The capability for agriculture is based on a classification of mineral soils that are grouped into seven classes based on soil survey information (Table 5.1). Soils in classes 1, 2, 3 and 4 are considered capable of sustained uses for cultivatable field crops; those in classes 5 and 6 only for perennial forage crops, and those in class 7 for neither. In other words, starting from class 1 the soils are the best and virtually have no significant limitations for growing crops. As the system moves up the scale towards 7, the limitations are greater to the point that the soils will have no capability for arable agriculture or permanent pasture. The system also applies a

series of subclasses (except for Class 1) based on types of limitations. There are 13 subclasses that are applied and used to help map relatively definitive agricultural soil polygons; in the Kelowna area, the scale is at 1:125,000. The definitions for each of the subclasses can be found at <http://sis.agr.gc.ca/cansis/nsdb/cli/classdesc.htm>, but are generally described as follows:

Table 5.1 Subclasses for CLI Soil Capability for Agriculture

Class	Definition
C	Adverse Climate
D	Undesirable Soil Structure and/or low permeability
E	Erosion Damage
F	Fertility Characteristics
I	Inundation
M	Moisture
N	Salinity (soluble salts)
P	Stoniness
R	Depth to bedrock/rock outcropping
T	Adverse topography
W	Excess water
S&W	Cumulative/minor adverse conditions

The mapping convention that is used for CLI classification typically combines a number for the main class of soil (1 through 7) along with the applicable subclasses. A complex area will usually ascribe two or three ratings with the proportionate mix of soils, which is typical in the Kelowna area.

5.3.3 Kelowna OCP

The Kelowna Official Community Plan (OCP) presents overall policy direction and legislative authority for the future land use designations in the City. This document enshrines the ALR within the Resource Protection designation which provides the legislative framework to establish zoning pursuant the City's Zoning

Bylaw. In recent years, the City has added a new policy in the form of an urban containment boundary, known as the Permanent Growth Boundary. This policy direction is intended to further restrict any urbanization and parcelization of the ALR. The two ALR study areas are therefore protected under the auspices of 'layered' protection by both Provincial and local government. Nevertheless, local bylaws and the Agricultural Land Commission Act still permit landowners to apply to the respective government authorities to have their land removed from these controls. According to one of the study participants, the varying level of enforcement of the rules has been recognized as a main reason for some of land use disorder and slow but constant erosion of the agricultural land base. The City officials, are however, quick to point out that enforcement has recently been ramped up and that there is more agreement between the City and the ALC to protect their common interests in the ALR within the City.

5.4 Study Block Land Use Spatial Analysis

In this thesis, I argue that agricultural land preservation, urbanization and urban sprawl are inextricably linked. The ALR/ALC has been noted to help avoid the advancement of urbanization in cities such as Kelowna. In 2008 the Agricultural Land Commission and the BC Ministry of Agriculture and Lands, published a pivotal report entitled: The Agricultural Land Reserve and its Influence on Agriculture in the City of Kelowna: A Review from 1973-2006, which claims that "although the presence of the ALR has not completely prevented the loss of agricultural lands, in all probability, farmland would have been lost at a much faster rate if the ALR had not existed...." (ALC/MAL, 2008. p. 3). It further extols that the "ALR has been

effective in maintaining urban boundaries and controlling urban sprawl; and without the ALR, the agricultural lands.... that were subject to exclusion applications may have been developed into residential areas” (2008, p. 6). Empirically, the report makes a valid point: without the ALR, more agricultural land would likely have been converted to non-agricultural uses. The data which supports this idea is derived from a review of the applications for exclusion (from the ALR) dated from 1973 to 2006 (Table 5.2, 5.3 and 5.4).

Table 5.2 Reduction in ALR Land if All Exclusion Applications had been approved

	Area (ha)
ALR Area at designation	10,054
ALR Area (2007)	8,751
ALR exclusions approved (1973-2006)	-1,303
ALR exclusions refused (1973-2006)	-2,367
ALR Area if all exclusions had been approved	6,384 (65%)

Source: Ministry of Agriculture, 2008

Table 5.3 Area of ALR Exclusion Applications

	ALR Area (ha)	ALR Area (%)
Refused Exclusion	2,367	24%
Approved Exclusion	1,303	13%
Total Applications	3,670	37%

Source: Ministry of Agriculture, 2008

Table 5.4 Overview of Land Use (2001) on Parcels Refused Exclusion from the ALR in Kelowna

	Number of Parcels	Total Area (ha)	% of Total Area Refused
Agricultural land use	279	1,764	75%
Non-agricultural land use	125	553	23%
Land use data unavailable	19	50	2%
Total	423	2,367	100%

Source: Ministry of Agriculture, 2008

Using this report as a basis for comparison, an empirical investigation of agricultural land use change in the two study blocks of Kelowna was carried out. To gain an appreciation for the impact of the ALR in the two study blocks and the attendant suburban development that may have occurred due to leapfrogging of the ALR in the inner fringe a spatial analysis is conducted using a series of maps drawn from the City of Kelowna Official Community Plan, and the Canada Land Inventory (CLI) for Agriculture.

The spatial analysis reviews and presents the two study blocks using the following criteria:

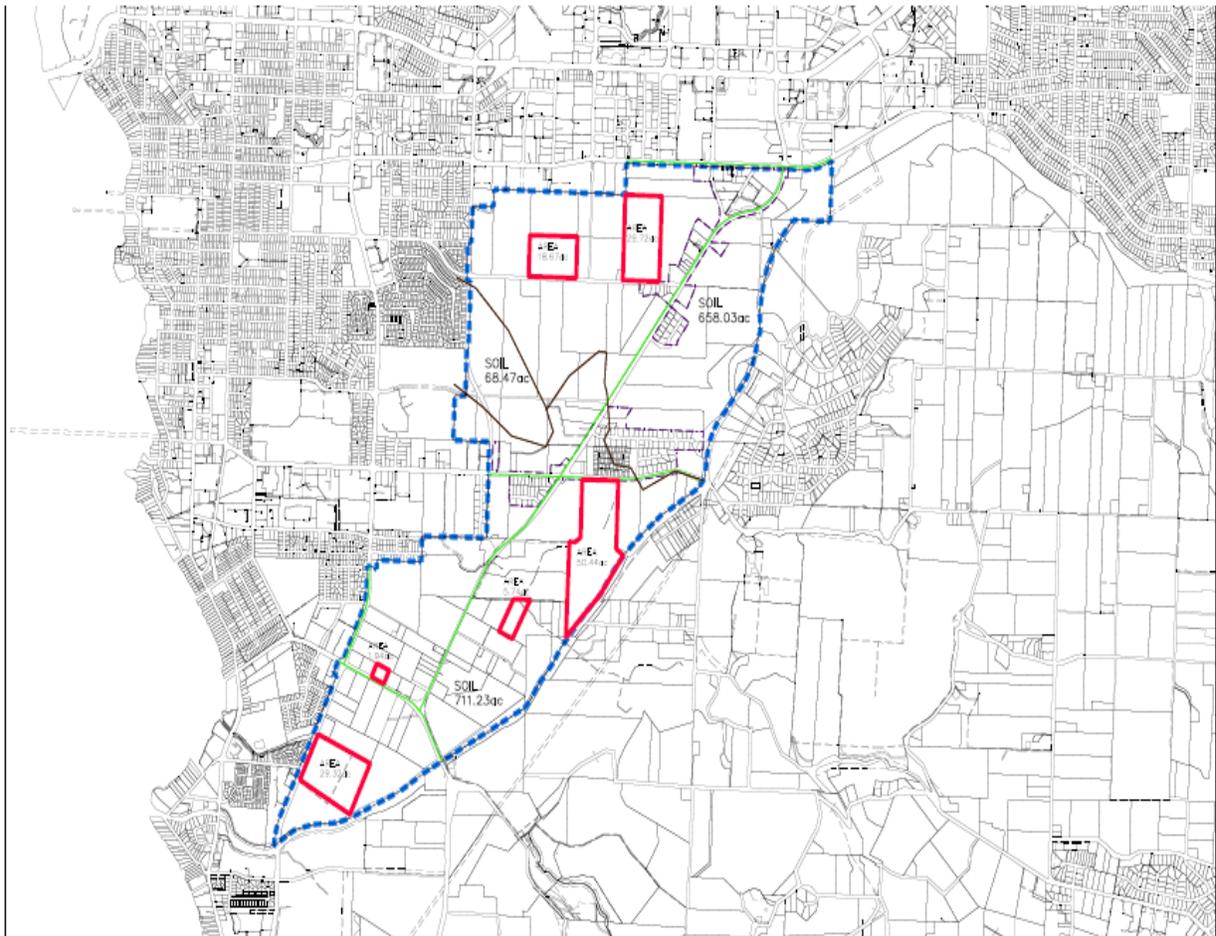
1. Description of the ALR Study Blocks (size, land area by use and agricultural activity)
2. Extent of major roads through the ALR blocks
3. Urban land uses on edge of the ALR blocks
4. Urban and non-farm uses within the ALR blocks
5. Canada Land Inventory for Agriculture classification

Following the spatial analysis of land use change, an urbanization test that measures land use density is calculated for each study block. This test determines the amount of land consumed at a range of densities which helps to envision and define the amount of sprawl and the implications of leapfrogging development into the suburban areas. The test offers a means to examine the ALC/MAL claim that agricultural lands that were subject to exclusion applications would have been converted to non-agricultural uses.

5.4.1 KLO-Benvoulin Block

This block extends from Springfield Road at the north end to where Gordon Avenue crosses Mission Creek at the south end (Figure 5.3). It includes the ALR lands on both sides of Benvoulin Road up to Mission Creek to the east, and extending westwards as far as Gordon Avenue at the south end.

Figure 5.3 KLO-Benvoulin Block: Roads and Lot Sizes



Source: City of Kelowna Cadastral; Map created by E. Grifone, 2017

Further north, the western boundary is formed by urban uses, largely running along the future extension of Burtch Road. The overall area is 1,437 acres, of which approximately 1,300 acres are contained within the ALR.

The farm parcel sizes range from 2 acres to 50 acres, and are generally located in the following clusters:

- Casorso Road Area: 2-acre to 30-acre parcel sizes
- Between Saint Charles Garnier Church and KLO Road: 6-acre to 50-acre parcel sizes
- Between Springfield Road and Munson/Fisher Road area: 18 to 30-acre parcel sizes

The latest definitive inventory of agricultural activities in this area was produced as part of the ALC/MAL study prepared in 2008 (Table 5.5). It shows the following breakdown:

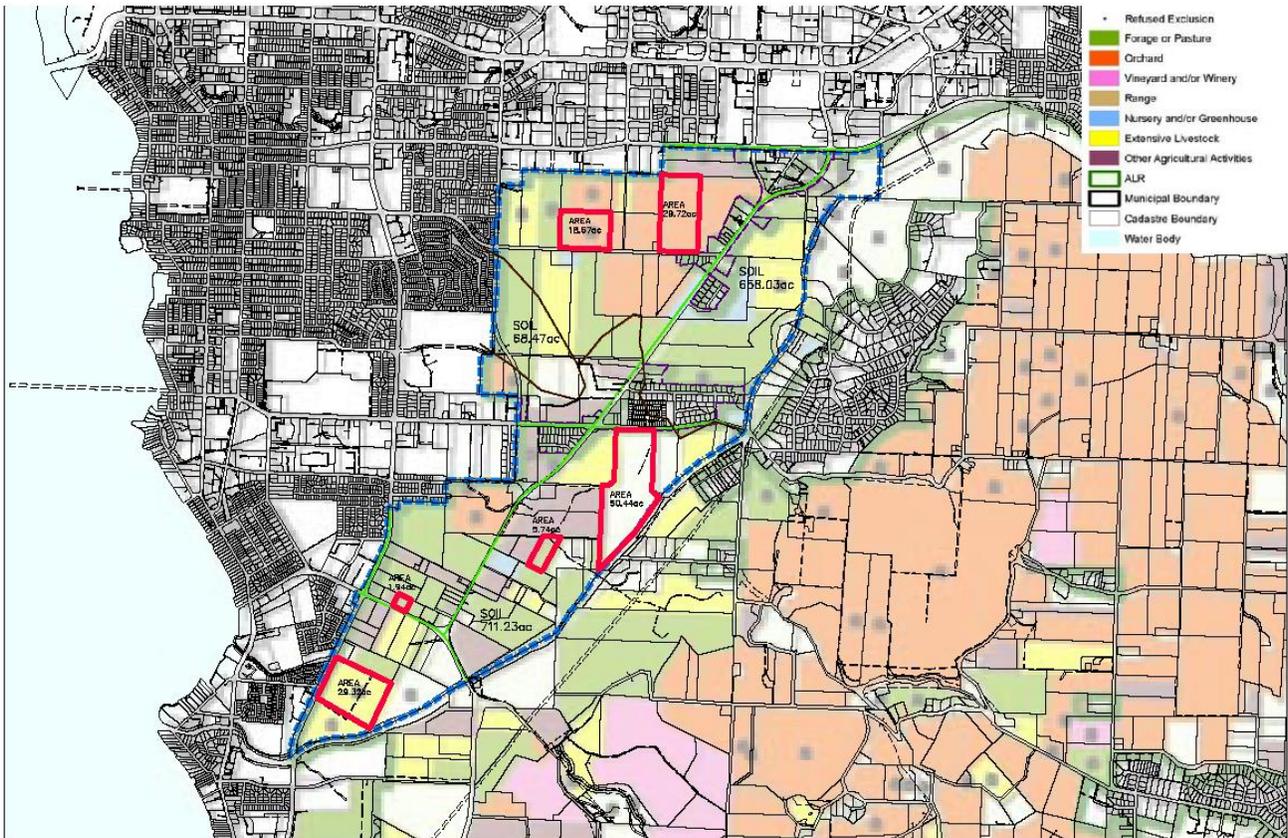
Table 5.5 KLO-Benvoulin Block Agricultural Activities

Agricultural Activities	Percentage of ALR
Forage or Pasture	24%
Orchard	15%
Vineyard	0
Range Land	5%
Nursery/Greenhouse	4%
Extensive Livestock	26%
Other Agriculture (mixed farming; crops, etc.)	26%

Source: Analysis of maps conducted by E. Grifone, 2017 using data from Ministry of Agriculture study, 2008

Although the inventory does not refer to fallow or idle land, it does appear, through personal observation, that those lands identified as Range and even Extensive Livestock have been abandoned, and as orchard trees are removed in much of this block, they have not been replaced. However, the north part of this study block contains a stable concentration of fruit tree orchards along Burns Road. The south part is more oriented to forage and pasture with a concentration of rural acreages/hobby/horse farms, as well as market gardens. Both the extreme south end and north end of this study area have experienced repeated applications for exclusion from the ALR. (ALC/MAL, 2008) (Figure 5.4)

Figure 5.4 Agricultural Activities: KLO-Benvoulin Block (2008)



Source: Agricultural activities by Ministry of Agriculture, 2008; Cadastral by City of Kelowna; Map created by E. Grifone, 2017)

Roads

The Official Community Plan identifies the major roads as the main arterials through Kelowna (identified in Figure 5.3 and Table 5.6). These are roads that carry large volumes of traffic between neighbourhoods and connect residential areas to employment and commercial hubs of the city. Most of these roads are located immediately adjacent to the ALR. In recent years, all major roads through this block have seen significant upgrades including widening from rural standards to full urban standards. The upgrades have included new utilities, servicing the areas within and beyond the KLO-Benvoulin block. The most recent sanitary sewer

service was extended up KLO Road to the Fisher subdivision near Mission Creek. As the south end of Kelowna continues to grow, Benvoulin and Gordon Roads will see increased traffic volumes. It is these roads and associated urban influences that contribute to speculative interests amongst the landowners that feel their agricultural lands have 'higher and better' uses. The more agricultural parcels that these roads allow access to, the greater the potential for subdivision. Cumulatively, these conditions have typically encouraged landowners to file applications for exclusion or non-farm use.

Table 5.6 Length of Roads along Perimeter or through ALR in KLO-Benvoulin Block

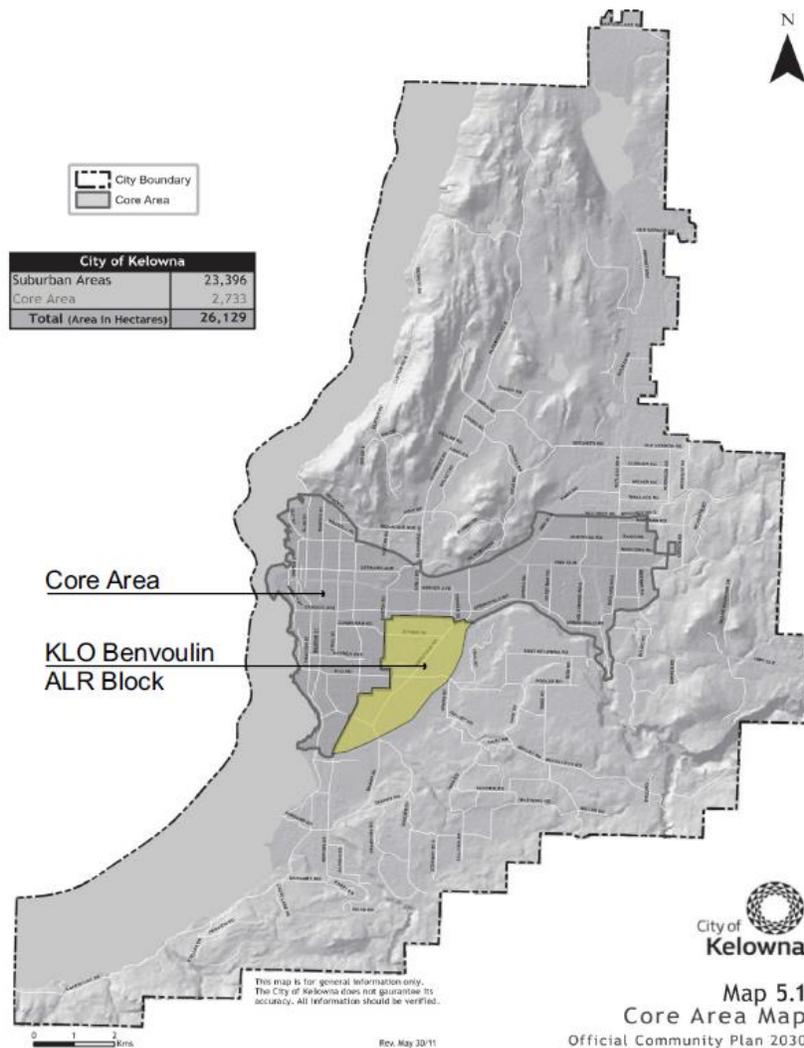
Roads	Length (km)
Benvoulin Road	4.1
KLO Road	1.5
Springfield Road	1.4
Gordon Road	0.6
Casorso Road	1.0
Total major roads	8.6

Edges of the ALR

The edges of the ALR that are often most susceptible to the forces of urbanization and consequently speculation are those that are immediately adjacent to the urban uses. The KLO-Benvoulin block has an extensive edge running along the north and west perimeter. In some areas, a road serves as the buffer, while in others, the urban uses are abutting the ALR. The ALC prefers a distance and/or road buffer where possible, however, different urban land uses will have different impacts on agriculture, therefore buffering needs will vary. The line of defence has held steady along some edges but less so in others, particularly where large parcels were converted to institutional, multi-family residential and church developments.

This ALR block is influenced by City's Core Area as identified in the City of Kelowna OCP. The core area forms both the north and western edges where there has been a slow but regular progression of erosion of the ALR by institutional, commercial, and gated residential communities. The Core Area is hemmed in by Okanagan Lake, steep sloped lands, Mission Creek and the ALR. It is, therefore, understandable that if the Core does not grow in height and density, it is this particular block of ALR that will experience the greatest pressure as demand for core-type uses grows (Figure 5.5).

Figure 5.5 The KLO-Benvoulin Block receives direct pressure from adjacent City Core Area



Source: City of Kelowna OCP, 2011, p. 5.4

There are six noteworthy edge conditions for the KLO-Benvoulin block:

1. Springfield Road: The south side of the road is lined with commercial, large churches and their affiliated buildings. Two large parcels accounting for approximately 24 acres remain in the ALR adjacent to the road. An exclusion request for a major mixed use commercial-residential project on this land was refused by the ALC in 2015. Immediately across the road there is a concentration of commercial uses, including a large shopping centre, and multi-family residential projects.
2. Gordon and Mission Creek: The southernmost corner of this block terminates with Mission Creek and the Mission Recreation Centre which was excluded from the ALR for park and institutional uses.

3. Western Edge (Burtch Road): The ALR in this area is flanked by large gated communities, but on the western side of the road. Some of these lands were formerly removed from the ALR.
4. Western Edge (Gordon Drive): The ALR in this area is flanked by several strata communities in both single and multi-family residential forms, and a large church.
5. Near corner of Gordon and KLO: The ALR in this area is immediately abutting a variety of land uses, including relatively new development on the south side of KLO Road. Once again, multi-family residential and institutional uses such as a Catholic High School form the edge along the ALR boundary. This area has seen one of the more aggressive fronts for urbanization, moving eastward along KLO Road.
6. Mission Creek: The eastern boundary to this block is formed by Mission Creek and its riparian area. This is a compatible edge for the ALR, except for occasional spring flow damage during the freshet. To the east of the creek, a large contiguous block of ALR on the upper plateau, supports some of the most productive orchards in the Central Okanagan. Only the Hall Road community and golf courses break up an otherwise extensive farming area removed from the inner fringe by topography and distance.

Land Uses within the Study Block

Besides the forces of urbanization being exerted along the outer edges of the ALR block, there are signs of impact within the block itself. These are non-farm uses that existed in advance of the ALR being established in 1973, and some new developments that have occurred in subsequent years. These non-farm and urban uses either have direct impacts on farming practice or are perceived to be incompatible with farming. The result may be further speculation of the agricultural lands while promoting greater interest amongst the landowners to pursue exclusion, especially for the most proximate lands. These non-farm or urban uses are also the ones that have potential to cause disorder in the land use planning framework.

Besides the roadway expansions noted above, the uses that are of particular interest in the KLO-Benvoulin block are as follows (Figure 1.5):

- Two high schools

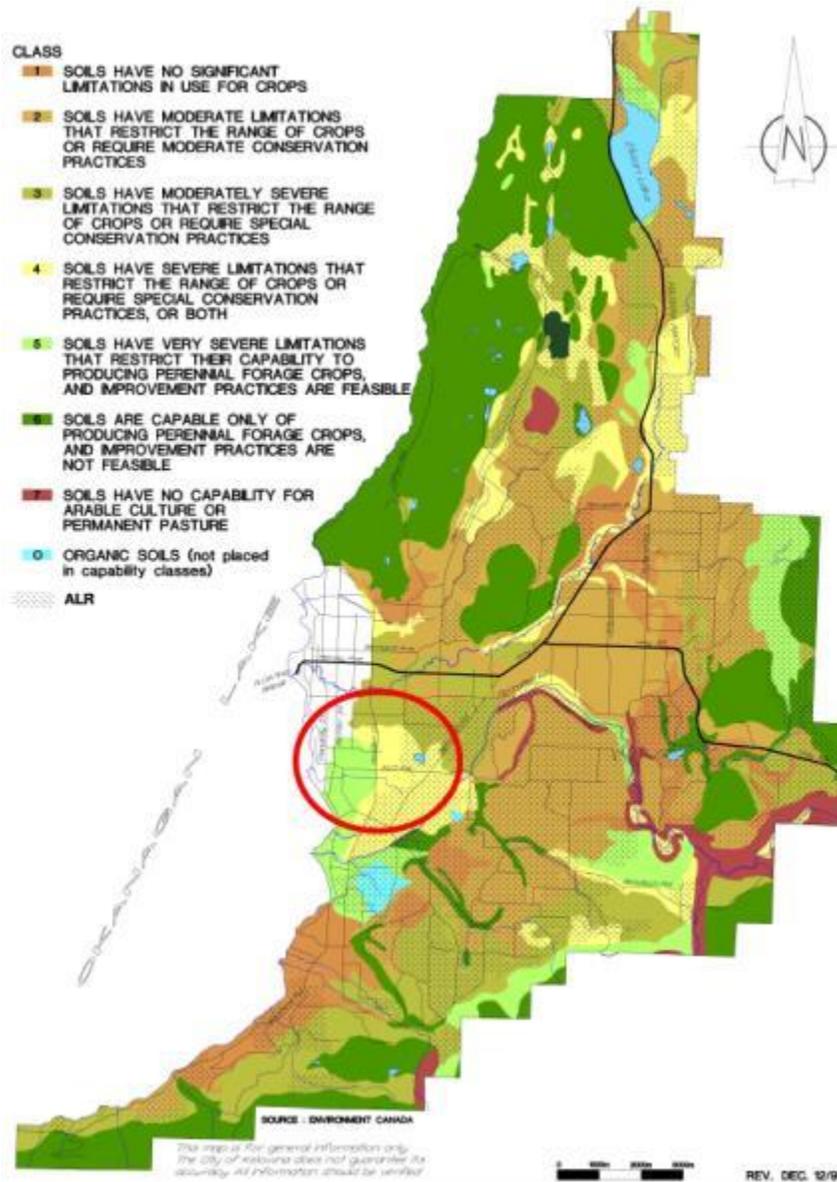
- Fortis Regional Office expansion
- Nurseries including retail and storage
- Landscape businesses
- Golf courses and driving ranges along with attendant uses including paved parking
- Multi-family residential buildings
- Benvoulin Heritage Church relocation
- Catholic Church Expansion (Diocese Headquarters)
- Congregate Care facilities
- Existing and expanded single family residential uses
- Storage areas
- Small commercial retail and service uses
- Munson Pond Park

The City of Kelowna has also designated two large parcels (approximately 30 acres) for future public utility near Munson Pond. A city supported ALR exclusion occurred in 2005 to allow the realignment of roadways at the corner of Benvoulin, Cooper and Springfield Roads. New land uses were also proposed at this location.

Canada Land Inventory (CLI) Agricultural Classification

For this block, it is important to note the qualifier that the CLI uses for irrigated land. However, the issue of excessive water that is naturally occurring in the KLO-Benvoulin block must also be noted. The CLI system discussed earlier accounts for irrigated and non-irrigated classifications (on the CLI maps, the description noted in red is the irrigated classification and the one in black is the non-irrigated classification). An example is: 4_{5/w} 3_{4/w} 5_{1/w}, which is described as follows: 50% class 4 with excessive water limitations, 40% class 3 with excessive water limitations, and 10% class 5 with excessive water limitations. Some of the examples of the severity of limitations related to excessive water are those such as limiting the range of crops, requiring special conservation practices, or restricting the capabilities of soils to produce perennial forage crops.

Figure 5.6 Soils Limitations KLO-Benvoulin Block



Source : City of Kelowna Agricultural Plan, 1998, p.47

In the case of the KLO-Benvoulin study area, there are three main soil ratings (all irrigated ratings) that apply to the entire 1437 acres. The proportions of soil categories are as follows;

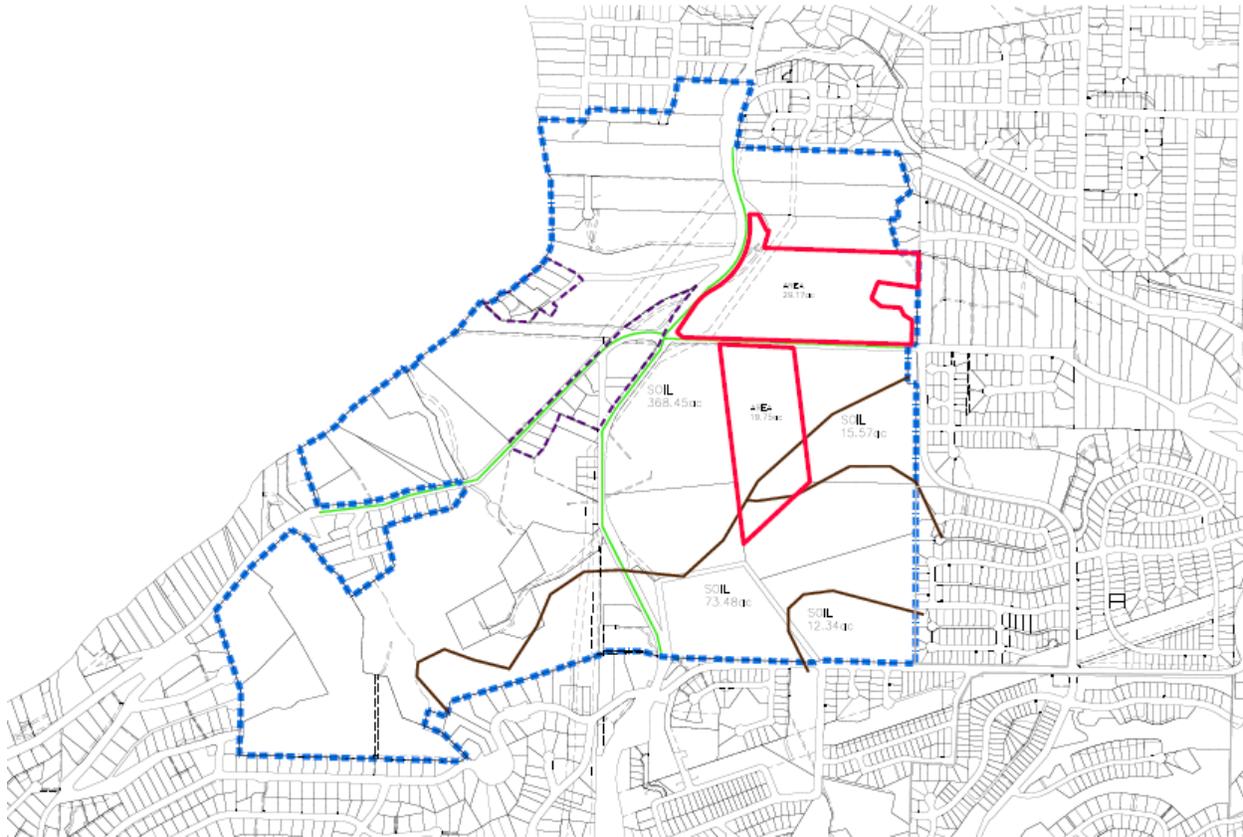
- 36/MW 44/W 46%
- 45/W 34/W 51/W 49%
- 46/WN 54/WN 5%

The study area shown in the red circle in Figure 5.6 further describes the Class 3, 4 and 5 soils with severe limitations. The Class 4 soils (yellow) located on both sides of Benvoulin Road contain the greatest amount of severe limitations due to excessive water.

5.4.2 South Lakeshore Block

This block of ALR extends from the Belleview Creek Commercial area near Collet Street at the north end down to Okaview neighbourhood and Frost Road at the south end (Figure 5.7). It includes ALR land along Lakeshore Road and Chute Lake Road but is interspersed with rural residential uses along both roads. The eastern edge is formed by new single family residential in the Quarry subdivision, while the western edge is formed by Okanagan Lake and the older established Mission neighbourhood. The overall area is 470 acres, of which approximately 453 acres is contained in the ALR. The parcel sizes in this block are mainly 20 and 30 acres each.

Figure 5.7 South Lakeshore ALR Block: Roads and Lot Sizes



Source: City of Kelowna Cadastral; Map created by E. Grifone, 2017

The inventory of agricultural activities in this block (Table 5.7, Figure 5.8), as defined in the ALC/MAL 2008 study, is as follows:

Table 5.7: South Lakeshore Block Agricultural Activities

Agricultural Activities	Percentage of ALR
Vineyard/Winery	34%
Orchards	30%
Mixed (includes old hazelnuts)	10%
Horses/Livestock	12%
Forage or Pasture	14%

Source: Analysis of maps conducted by E. Grifone, 2017 using data from Ministry of Agriculture study, 2008

Figure 5.8 Agricultural Activities: South Lakeshore Block



Source: Agricultural activities by Ministry of Agriculture, 2008; Cadastral by City of Kelowna; Map created by E.Grifone

Roads

The main roads in this block are Lakeshore, Chute Lake and Barnaby. Each of these roads have seen a considerable increase in traffic volumes due to the new residential subdivisions at the south end of Kelowna. Chute Lake Road extends off Lakeshore serving a large area of mainly single family residential development. Barnaby Road is also a major feeder road into Lakeshore Road, carrying traffic from and to the Southridge neighbourhood. These roads have had extensive widening and urban standards imposed in recent years. The development in the vicinity of the South Lakeshore block is expected to continue to grow because of the developer intentions, further adding to traffic volumes along these key roads (City of Kelowna

Area Plans). Compared to the KLO-Benvoulin Block, access into South Lakeshore Block ALR is much more limited, as development within the block is minor. Length of main roads within this ALR block:

- Lakeshore Road 1.6 km
- Chute Lake Road 0.9 km
- Barnaby Road 0.62 km

Total major roads in this block account for 3.1 kilometers, most of which are located immediately adjacent to properties in the ALR. Only a short length of Chute Lake Road (near the intersection with Lakeshore Road) runs through non-ALR lands.

Edges of the ALR

Except for a short length of lakefront, the entire block is surrounded by single family residential development. Furthermore, there are several residential streets that end abruptly on the edge of the ALR, indicating potential for phases of development to proceed into the block itself. Examples of such streets include: Devonian (east side); Viewcrest (west side); Belleview (north side); and Avery (internal).

Topographic relief along some of the edges has helped provide a buffer. In some cases, larger lots such as along Okaview Road, have also served as buffers between the residential development and the agricultural lands.

Uses within the Block

The uses within this block differ considerably from the uses within the KLO-Benvoulin block. The sloping land towards Okanagan Lake have attracted pockets of large lot single family residential subdivision where views of the lake can be enjoyed. Developments that predated the ALC/ALR are located along Lakeshore

Drive in clusters such as Avery Road and Lakeshore Place. Executive style homes are also spread throughout this ALR block where they occupy large parcels of farmland. The lands on the lower side of Chute Lake Road are in vineyards and orchards except for lands close to the Lake which include horse ranches and hobby farms, along with executive homes.

The lands above Chute Lake Road are in much larger parcels than the area between Lakeshore Road and Chute Lake Road. The Summerhill Vineyards/Winery occupy 80 acres. There are several 20 acre parcels in the Frost Road area, otherwise the orchard lands near Barnaby are much larger. For example, Sun City Cherries occupies 65 acres on one parcel alone. Both Summerhill and Sun City lease other parcels near their main operations, accounting for the largest farms in the area.

This block also contains environmentally sensitive areas (ESA) in the form of ravines, creeks and wetlands. These often serve as buffers or help delineate farm properties. Some of these natural features, however, often contribute to poor soil conditions which landowners will use to argue reasons for ALR exclusion. The more marginal lands, although minor, lie idle or are under farmed. Also, many of the landowners in these areas are not farming full time and some of the lands are used for storage rental, posing another challenge for the City.

The South Lakeshore Block, although under pressure from urbanization along the outside edge, does not suffer from speculation as does the KLO-Benvoulin Block. No real estate 'For Sale' signs or MLS listings were evident during the study period. This may be attributed to minor roadway impacts and much less urban and non-farm development within the ALR block. Furthermore, since the pressures in this

area are mainly from residential development, there are other large land holdings in this outlying area that can absorb the growth. This is unlike the pressures on the KLO-Benvoulin Block that are attributed to the City's Core Area influence.

Canada Land Inventory (CLI) Agricultural Classification

Using the same mapping convention as with the KLO-Benvoulin study area, the following breakdown applies for the entire 470-acre South Lakeshore block:

- 15 24/X 61/T 78%
- 35/M 42/M 63/T 15%
- 36/TM 64/TM (only class 3 is an irrigated rating) 4%
- 3WM 3%

The significant amount of class 1-3 soils (Figure 5.2) may provide an explanation for this block's defence from the forces of urbanization and speculation. The KLO-Benvoulin block, on the other hand, contains a significant amount of Class 3 and 4 soils with more limitations than the South Lakeshore block.

5.5 Density Transfer Test

This part of the analysis includes a test of residential density patterns to assess land consumption under different development scenarios. It is a means to explain the implications if urban development made more efficient use of the land within the inner fringes or the inner city of Kelowna. It is also a way of exploring how urbanization of land and urban sprawl might be mitigated by using different forms of housing other than the conventional large lot single family residential patterns that now dominate many of the suburban neighbourhoods. Although theoretical in nature, this concept of counteracting sprawl has formed the basis of the City's recent initiative to incentivize increased density and infill development in the town centres and Core Area of Kelowna.

To start the discussion on the urbanization test, it is important to reiterate the reference made in the ALC/MAL report of 2008 about potential conversion of agricultural land if the ALR did not exist. Using the data provided in Table 2 of the ALC/MAL report (p.4), it is suggested that the combined approved and refused applications for ALR exclusion accounted for more than 3,600 ha. (8,890 acres). This was (a rate of loss of) 43 ha. per year over a 30-year period. The report also graphically illustrates the potential change in the agricultural landscape (p.6) if all the exclusion applications had been approved and the properties were developed to a similar density as adjacent single family neighbourhoods. I have assumed that the density factor used was likely no greater than 4 to 6 units/acre as depicted in the illustration of the 2008 report. The test that follows explores comparisons of hypothetical higher density development in the inner fringe or inner city areas with the lower density that has evolved in the suburban locations of Kelowna and outlying areas.

Through simple calculations and based on key assumptions, the test helps provide an understanding of land consumption and how it relates to potential avoidance of urban sprawl and leapfrog development patterns.

Three 'models' have been used to illustrate the density transfer test:

- | | |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Model 1 | Uses a 50-acre parcel to show land efficiency differences between alternate forms of housing and implications on sprawl; |
| Model 2 | Uses examples of current and developing suburban/outlying neighbourhoods in Kelowna that are building out at relatively low densities and translating into what is being identified as sprawl; conversely, these low density single family forms are compared to compact single family and townhouse densities to show how much land is consumed for a 60-unit project, and how sprawl might be avoided; |

Model 3 Uses a realistic forecast absorption of 1000 units per year for Kelowna, and the impact on land consumption using various forms of housing and how sprawl can continue well into the future if the lower density forms of housing continues to be the norm.

5.5.1 Density Explanation

Density, when related to planning for urban residential areas, is generally defined as the amount of development permitted on a parcel of land. It is usually measured by dwelling units per acre (U.P.A.) or floor area ratio (F.A.R.). A gross area density measurement will typically include public rights of way and parks. A net density measurement is calculated using only the land occupied by the residential uses; it does not include streets, parks and other uses. Much of the older part of Kelowna was developed at a gross density of 3 to 5 units per acre, largely attributed to mainly single family housing forms. For the newer suburban developments, the lots have been larger, and have included little if any multi-family units, creating gross densities at the lower end of the spectrum. In contrast, many of the gated communities in strata formats have been developed at closer to 6 units per acre. A typical example is the Balmoral Resort Community located near the corner of Byrns, Burtch and Guishichan Streets which was developed in the 1990s at a gross density of approximately 5.7 units per acre. This development is on level ground where land was not 'wasted' on difficult terrain.

The density ranges will vary based on the type of housing, rising from the traditional single family homes at 6 to 10 units per acre (net) to 100 units or more in a residential tower. The densities of interest in this research are generally between those of single family homes and medium and high density urban residential at not much more than 30 to 45 units net density.

This broad range includes semi-detached (duplex), 3 to 6-plex townhouses, row houses and garden apartments (Table 5.8).

Table 5.8 Range of Density for Typical Housing Forms

Land Use Designation	Typical Housing Form	Density (UPA Net)	Avg. Lot Sizes (sq. ft.)
Suburban Residential	Acre Res.	1-2	43,560
	½ Acre	2-4	21,780
Low Density Urban Residential	Traditional SFR	6-8	6000 or less
	SFR with Suite	8-10	4000-4500
	SFR with Ancillary Suite (coach house)	8-10	4000-4500
	Duplex	8-10	4000-6000
Medium Density Urban Residential	Compact SFR	10-12	3000-4000
	Two Family/Duplex	12-15	3000-4000
Medium High Density Urban Residential	Multi-Unit (SF appearance)	15	4000-4500
	Row Houses	15-25	2000
	Townhouses	15-25	32,000 (1200/unit)
High Density Urban Residential	Multi-Family Walk-up Flats	25-45	32,000 (1200/unit)
	Ground oriented Apartments	25-45	40,000 (930/unit)

Source: E. Grifone, 2017

5.5.2 Model 1 - Land Efficiency with Alternate Forms of Housing

As was noted earlier in this section, agricultural land preservation, urbanization and urban sprawl are inextricably linked. The literature abounds with research about how North American cities continue to grow on the edges disproportionately to population growth, causing inefficient use of land, environmental impacts, pressure on rural areas, human health concerns, traffic problems, and municipal financial strain to service the outlying suburbs. Without citing the ‘smart growth’ label that is often used today, city planners and councils recognize that an effective means to mitigate or slow urban sprawl is with policies that encourage higher residential densities. In BC, for example, many Official

Community Plans prepared over the past 10 to 20 years have shifted focus to encourage a greater proportion of multiple-family residential forms. In the past, build-outs averaged close to 10-20% multi-family and 80% or more single family. With the benefit of policy changes and recent societal and economic influences, many communities, including Kelowna, now achieve a greater proportion of multi-family units constructed on an average annual basis. For example, in 2015, 60% of building permits issued in Kelowna were for multi-family and 40 % for single/semi-detached units (OCP Indicators Report, City of Kelowna, 2015). The intent is to continue this trend towards a greater proportionate mix of yield in multi-family units (City of Kelowna, OCP, 2011; OCP Indicators Report, 2016).

With this background, I have calculated land efficiencies of a hypothetical 50-acre parcel of land at densities that could accommodate compact single family or duplex, townhomes and multi-family flats/ground oriented apartments. When compared, these alternate forms of housing clearly show land use efficiencies over the traditional low density single family model at say 3 to 5 units per acre (Table 5.9).

Table 5.9 Land Efficiency for 50 Acre Parcel by Residential Forms

Residential Form	Density (UPA)	Av Lot Size (sq. ft.)	Build Out (50 acres)
Compact SFR/ Duplex	10-12	3000-4000	500-600 units
Townhouse	15-25	4000-5000 (1200/unit)	750-1250 units
Multi-family W/Up Flats/Ground Apts.	25-45	35,000 (avg.) (900-1200/unit)	1250-2250 units
Gated Community	5.7	Strata	285 units
Traditional SFR	3-5	4000-6000	150-250 units

Source: E. Grifone, 2017

It is understood that a comprehensively planned 50-acre parcel of land may not contain all one form of housing, but this general model does demonstrate how residential development with increased densities will translate into land efficiencies, and if strategically located in the inner city/inner fringe, could alleviate sprawl over a period of time.

5.5.3 Model 2 - Land Consumption Based on Current Suburban Density in Kelowna

The second model describes the real situation in the suburban neighbourhoods of Kelowna and outlying areas. It is understood that many of these new communities are master planned with residential, parks, open spaces/protected areas, amenities such as golf courses, and roads. Recent Kelowna examples include the Ponds, Quarry, Wilden, Southridge, Black Mountain, Tower Ranch, Glenmore, University Village and Kirschner Mountain (Table 5.10). Most of these new projects have required substantial alteration of the land form to accommodate roads and building platforms on original difficult terrain and steep topography. To date, many of these projects have been built out at relatively low density, except for Glenmore Valley and University Village where some multiple-family residential forms have been included. In the case of University Village, the Master Plan has called for a greater proportion of apartment units than single family, even including micro-suites to accommodate the UBCO student market nearby. Many of these new developments are in hillside areas, hence multi-family apartment residential is difficult to accommodate and traditional single family and some townhouses are typical. Furthermore, extensive open space or park

designations accommodate the steep slopes in many of these hillside developments, further reducing the gross density (Note: the approach to density calculations for these projects is noted in Section 3.1).

Table 5.10 Build Out Density for Select Suburban Neighbourhoods

Project	Type	Density units/acre (Gross)	Conditions	Amenities
Ponds	SFR	1200/450 ac. (2.6 u/acre)	Includes Small lot SFR and Traditional SFR	Parks, open space, commercial area
Quarry	SFR	3.5u/acre	Traditional SFR	Neighbourhood Park and powerline along edge
Wilden	SFR (Hillside)	2800/2000 1.4 u/acre	Traditional and large lot SFR	Linear parks to protect steep terrain/sensitive eco-scape
Southridge	SFR (Hillside)	2.5u/acre	Traditional SFR	Parks, major detention pond and open space
Black Mountain	Mixed (Hillside)	3.1u/acre	Integration of Townhouses with SFR	Golf course, parks, open space
Tower Ranch	Mixed (Hillside)	N/A	Significant land works	Golf course
Kirschner Mountain	Low Den (Hillside)	2.6u/acre	Significant land works	Significant open space, parks
Glenmore	Medium	4u/acre	Includes MF and townhouses along with Traditional SFR	Linear park system
University Village	Med/High	N/A Large proportion of MFR	Significant land works	Linear park, open space, plaza with neighbourhood commercial

Source: Analysis conducted by E. Grifone, 2017

In order to illustrate land area consumption of these suburban densities compared to higher density urban residential forms, a simple land density test was applied. This test using 60 units could typically be developed in the form of small townhouse blocks, row houses or a small apartment building (Table 5.11). The

comparison with the current suburban projects at even 3 units per acre shows how approximately 5 times more land is consumed than with a low density townhouse project.

Table 5.11 Land Consumption with 60 units built in different residential forms

Residential Form	Density (Gross)	Lot/Unit Size (sq. ft.)	Land Consumed (60 u)
Townhouses (Med)	25 Units/Acre	30,000/1200	2.4 Acres
Townhouses (Low)	15 Units/Acre	5000/1000	4 Acres
Compact SFR/Duplex	10 Units/Acre	4000/1000	6 Acres
Traditional Large SFR	3 Units/Acre	6000-8000	20 Acres
Large SFR(Hillside)	1.4 Units/Acre	10,000+	42 Acres
Large SFR (Hillside)	0.5 to 1 Unit/Acre	10,000-20,000	120-60 Acres

Source: E. Grifone, 2017

The lower densities are found in suburban areas where market demand may call for the larger lots, and undulating terrain and steep topography make higher densities difficult. Critics may suggest that some of these projects may not be economic to build at lower densities. However, developers are able to keep price points relatively high, especially if the lots command panoramic views and buyers want to build large homes. The economic returns, coupled with the lower cost of land when compared to urban areas, make these projects feasible, but more land is generally consumed. Even with some compact housing (e.g. small lots and townhouses) included in the development, the overall densities are lower in the suburban developments than in most of inner city developments. In recent years, cities such as Kelowna have introduced 'Hillside' zones (in their Zoning Bylaws) and Steep Slope Development guidelines to assist in achieving more efficiencies and protecting the integrity of sensitive and hazard lands. Regardless, it can be understood why the low ratio of residential units to land is viewed as sprawl.

5.5.4 Model 3 – Land Consumption Based on Forecast Growth

The third model that is used to demonstrate the impact of land use density on sprawl is the forecast absorption and consumption of land area based on New Building Unit permits. In this case I have extrapolated from the City of Kelowna statistics for the two most recent years (2015=1,430 new units; 2014=1,029 new units). Although the population growth rate has been averaging close to 2-3% per annum during the past 10-15 years, for this model we have assumed a flat (average) rate of growth at 1,000 incremental units per year and 2.2 people per unit. It was 2.3 in 2006, and most municipalities in the Okanagan Valley are now forecasting between 2.1 and 2.2. Again, various density factors translating into different housing forms have been applied to demonstrate general land consumption. The lowest density factors assume the continued development of the suburban hillside locations with difficult terrain and steep topography, with little if any new growth in the inner-city neighbourhoods. Although this is considered unlikely in today's planning policy regime, it does warrant attention and lends credibility to the City's quest to incentivize inner city development and use of higher densities in the existing town centres (Table 5.12).

Table 5.12 Annual Land Consumption based on 1000 Units Absorption (Hypothetical)

Forecast Absorption Based on 1000 New Units/Year		
Development @:		
1 unit/acre =	1000 acres are consumed	(2.2 people per acre)
2 units/acre =	500 acres are consumed	(4.4 people per acre)
3units/acre =	330 acres are consumed	(6.5 people per acre)
5 units/acre =	200 acres are consumed	(11 people per acre)
10 units/acre =	100 acres are consumed	(22 people per acre)
20 units/acre =	50 acres are consumed	(44 people per acre)
30 units/acre =	33 acres are consumed	(66 people per acre)

Source:E. Grifone, 2017

Even rising from the traditional low density single family forms at approximately 5 units/acre to more townhouses and low profile apartments at 10-30 units/acre, will save considerable land mass. Mathematically speaking, achieving residential forms such as duplexes, townhouses and low profile apartments will save hundreds of acres of land consumption every year, especially if sprawl is not required due to market demand (i.e. buyers wanting view lots). If the annual average forecast population growth rate is assumed to continue at approximately 3% and at a low of 2.2 people per unit, the need to achieve greater land efficiencies will become paramount in the planning of this city.

5.6 Summary

The two study blocks account for approximately 1,750 acres of ALR property. As inner-fringe areas, they are both influenced by forces of urbanization. The KLO-Benvoulin block experiences greater urban pressure than the South Lakeshore block. This land use spatial analysis has revealed the following for each of the two areas.

5.6.1 KLO-Benvoulin Block

This ALR block is significantly influenced by proximity to and growth of the City Core Area (as defined by the OCP). Since the Core Area is restricted to where it can grow in other directions, it is inevitable that this ALR block will continue to be threatened by urbanization. Although the ALR (and attendant City policies) may dissuade some of the forces of the encroaching edge development, the expansive flat land with full urban services, and main roadways running through the ALR block, will continue to entice speculation. Furthermore, the erosion of the agricultural

lands, prior to and after the introduction of the ALR in 1973, has been a contributing factor in the challenge to defend the ALR in this inner fringe area. The internal development within this block has exacerbated the situation by further exposing agricultural activity to urban and non-farm uses.

Various factors have led to increased mix of agricultural activities, illegal land uses, disorder and idle lands, or land left fallow for longer periods. The City of Kelowna's description of this area as the 'hot block' reflects their concern for the non-conforming uses and issues of land use control. Lands where orchards once existed have not been replanted for many years, however the tree fruit orchards in the north part of this block, where dewatering has occurred, have remained stable.

Applications for exclusion have been mainly directed to the north and south end of the study block, regardless of the diversity in parcel sizes and types of agricultural activities involved on the subject lands. Although this block contains Class 3 and 4 soils for agriculture, according to the CLI, they have 'moderately severe and severe' limitations that restrict the range of crops or require special conservation practices, or both. Excess water in the ground appears to be the main factor in the limitations.

5.6.2 South Lakeshore Block

This ALR block, although much further from the City Core Area, is influenced by the proximity of urban residential uses immediately along the edges. Recent large single family residential subdivisions, including abutting roads and municipal services, have provided expectations amongst some of the owners of the ALR properties. Although internal development is minor, traffic volume along roadways

running through the block has been growing due to new suburban residential development in south Kelowna. Nevertheless, speculation appears low with no For Sale signs on any of the properties. This block also exhibits less idle/fallow land and minimal illegal uses are reported compared to the KLO-Benvoulin block.

This area has sustained mainly vineyards and orchards on extensive parcels. Besides the predominance of larger parcels than the KLO-Benvoulin block, the South Lakeshore area contains varied topography and is sloped towards the lake, compared to the uniformly level ground in the KLO-Benvoulin block. Furthermore, the South Lakeshore block contains a concentration of high class soils for agriculture (Class 1-3), with less limitations than the other study block.

The density transfer test revealed how changes in density of residential development can affect need for land, which translates to implications for sprawl, leapfrog development and protection of agricultural land. Relating back to the 2008 report produced by the ALC and the MAL, where it was suggested that approximately 8,890 acres (3,600 ha.) of agricultural land could have been lost to urbanization if all applications for exclusion (between 1973 and 2006) were approved, there was a legitimate concern that without the ALR, continued low density urban expansion would have absorbed adjacent orchards and range lands. The three models described above, illustrate how use of various housing forms with higher density factors than the traditional larger lot single family can achieve greater land use efficiencies. Such efficiencies used in overall city planning and area master planning, may be means to mitigate sprawl, leapfrog development and further loss of agricultural land.

6. Discussion

The inner rural-urban fringe of Kelowna, BC is experiencing the influences of urbanization, amid the challenge of achieving agricultural land preservation. Since the early 1970s, the high quality of the agricultural land in many areas of this city has warranted protection by the Provincial Agricultural Land Commission (ALC). As one of the strongest pieces of legislation in Canada, the ALC Act and its attendant Agricultural Land Reserve (ALR) has helped the City of Kelowna preserve the integrity of pockets of agricultural land within city limits. However, the strong forces of urbanization, in one of the fastest growing cities in the nation, has created a challenging community planning dynamic. As much as the City's leaders, business people and residents promote and enjoy the rural character of their urban municipality, there is also concern about land speculation, non-farmland uses, sprawl effects, and the continued loss of agricultural land and associated farms. With 40% of the City's land base in the ALR, it is inevitable that agricultural land has significant implications for how the City is planned and developed.

This study focused on the inner rural-urban fringe not only to understand all these influences and their planning implications for the city, but also to help define the potential for urban farming and local food security. As strong as the ALC legislation may be, market forces have dictated that urbanization will continue to vie with agriculture for the same land base..

To appreciate this circumstance, its impact on city planning, and the potential for solutions, this study used four key questions as the basis to conduct the investigation:

- Is agricultural land preservation working in the inner fringe?
- Is farming being advanced in the inner fringe?
- Is urban sprawl being avoided in the city?
- Can small lot farming play a role to advance farming in the inner fringe ALR?

The research used to help answer these general questions entailed three key methods, including: (i) an extensive literature review of scholarly works and documented material regarding agricultural land preservation, urban sprawl and land economics, and the rising demand for small lot farms; (ii) quantitative research on two inner fringe ALR blocks in Kelowna, along with some comparative empirical modelling regarding residential densities, to support how higher density housing forms can use land more efficiently; and (iii) qualitative research using interviews with key players in city planning, farming and the land development industry.

Triangulated data obtained from these three diverse methods provide insight about the planning challenges and possible solutions.

With this background in mind, the four research questions and their findings will now be summarized.

6.1 Is Agricultural Land Preservation working in the Inner Fringe?

The City of Kelowna and the ALC are trying to hold the line on urbanization and support the preservation of agricultural land. The forces of urbanization near the KLO-Benvoulin block are very strong and a slow erosion of the ALR continues. The pressure from the City Core Area on this study area has come from the desire

for large institutional projects, senior's complexes, major roads, commercial use areas and gated communities. City planning officials admit that this area, dubbed the 'hot block', has been the source of some of the greatest challenges they face in trying to protect the ALR. In interview responses, planning officials point to the adjacent City Core Area development pressures, and questionable arability of the soils, along with decisions made by former Councils and misdirected planning policies that have exacerbated the situation. The combination of former development approvals within the ALR and on the outer edges has led to speculation as a normal practice. This has in turn given rise to non-farm uses, disorder, idle lands and constant applications to the ALC for exclusion of lands from the ALR.

Landowners interviewed are perplexed when the City and the ALC are not in agreement with regard to exclusion requests. This 'mixed message' has caused many of the landowners to continue to hope for lucrative land sales, or development projects often causing them to leave the land in an idle state. Owners that have recently had their applications refused, have vowed to continue their quest for exclusion. In response to this attitude, the ALC has become more adamant in their refusal decisions, and thus the battle continues. The findings suggest that control and enforcement may not be sufficient especially where property speculation is rampant.

The situation in the KLO-Benvoulin block reflects Stobbe et al's observations on the susceptibility of agricultural land to development (Stobbe et al, 2009). These researchers found that the most susceptible lands to ALR exclusion are those that

are: closer to highways, in smaller parcel sizes, within smaller, non-contiguous parcel areas and containing poorer soils. Curran (2005) feels that regardless of municipalities' efforts to foster more compact, complete and affordable urban communities, there will still be intensifying development pressures on agricultural land adjacent to urban areas in the most productive agricultural regions in BC, including the Okanagan. Nevertheless, after 40 years in existence, there has been no net loss of the ALR in the province as a whole, especially when some lesser quality lands were included in substitution for higher quality lands (ALC, 2011). Prior to the introduction of the ALR, the loss of farmlands amounted to 6,000 ha. per year. By 2005, that total loss had dropped to 600 ha. per year. This substantial decrease has been attributed to the rigorous legislation at the provincial level, and acceptance of the ALR by local governments in their own planning framework (Campbell, 2006).

In Kelowna, 1300 ha. of agricultural land was released from the ALR between 1973 and 2006. Of the 8,700 ha. of ALR that still remain in Kelowna, the urban pressure is felt the greatest within the inner fringe agricultural area. The KLO-Benvoulin block that accounts for approximately 6% and the South Lakeshore block for another 2%, are some of the most susceptible agricultural lands in Kelowna. The South Lakeshore block is under less pressure and the line is currently holding strong. This may be attributed to the better soils, and the two largest farms being able to derive income from value added production such as a winery, tourism hospitality and a cherry packing plant, not simply the grapes and cherries associated with these farms.

All the findings of this research suggest that there is a change in political philosophy regarding the development of agricultural land. Over the past four decades, the losses along the edges of the urban areas were significant. Even though BC had enacted strong “top down” legislation, with enough regulatory teeth to cause local government to work in tandem with senior government, there were still many examples of disagreement between Provincial policy directives and local interests (Newman et al, 2015). Researchers such as Newman believe that because land use planning and land development controls are within the local political scope of influence, there will continue to be disagreement about the use of agricultural land. Most recently, however, there appears to be a common vision amongst all parties involved. The alignment of the local government planning and approvals framework with the ALC’s legislative direction has resulted in a much more stable ALR boundary. This reflects the fact that top down legislation and its enforcement alone do not suffice (Brabec and Smith, 2002; Caldwell, 2012; Pfeffer et al, 1994; Raja et al, 2008; Resource Planning Group, 2002;).

What the future holds for the ALR in Kelowna will also be subject to the ability to enhance farming. If the economics of farming in the inner fringe is suffering, the speculation will continue to rise in response to the adjacent pressures of urbanization. The situation in Kelowna mimics the debate of the Greenbelt Plan in one of Ontario’s most fertile regions. Farmers in the Niagara area have challenged minimum parcel sizes, contending that 20, 30 and 40 acre farms are sitting idle and businesses are going under. The landowners within the provincially-legislated greenbelt say that the legislation is protecting the land but not helping farmers with

the viability of their farms. This lack of a comprehensive approach to agriculture is also impacting Kelowna's fringe areas.

As noted earlier, the Kelowna situation is trending closely with that of BC's Lower Mainland communities where some of the province's most arable ALR soils are located. The erosion of the ALR in cities such as Richmond continues due to the forces of urbanization and speculation, along with loopholes in the system (ALC, taxation, and municipal development approvals) (Globe and Mail, Nov. 19, 2016). Metro Vancouver (Regional Government) now estimates that "fully half of its agricultural land is not being farmed at all, while half of that has rich, high yield soil." Of the 50% that is not farmed, only 25% actually has potential to be farmed (Metro Facts in Focus: Farming in Metro Vancouver, UD; Metro Vancouver Agricultural Land Use Inventory, Ministry of Agriculture, 2012). The Landowner Survey by Metro Vancouver, 2012, revealed that the main reasons why such a large proportion of the ALR properties are not being farmed are: overall lack of interest in farming; the perceived unsuitability of land for farming and financial and operational challenges. The Kelowna inner fringe ALR situation is in many respects similar to the attempts to protect the integrity of agriculture in the Niagara region of Ontario or the Lower Mainland of BC. Feedback from the farming community in this Kelowna study suggests that the most effective way to protect arable agricultural land is to farm it. That is the subject of the next question.

6.2 Is Farming Enhanced in the Inner Fringe?

As seen in the previous section, the Agricultural Land Commission has been a stalwart supporter of its two main responsibilities; first and foremost, to protect

agricultural land; and secondly, to take an active role in local land use planning, in the interest of protecting agricultural land.

Over the past four decades there has been continuous questioning of whether the ALR has contributed to the enhancement of farming and in fact meeting its mandate. The role of the ALC Act and the attendant ALR is often misunderstood, especially in the common press, to be a piece of legislation that would enhance farming through increased farm production, and greater profits for farmers in BC. At the 2006 World Planning Congress, Runka, an early Chair of the BC Agricultural Land Commission, and a Professional Agrologist, noted that the intent of the ALR was to encourage the establishment and maintenance of the family farm in BC (Runka, 2006). In 2009, Katz of the Fraser Institute questioned whether the ALR had ever met this mandate: “the ALR does not appear to be in its ability to encourage agriculture although this was one of its founding mandates” (p. 12). Katz added that the legislation had not encouraged family farming, as promised by Runka, since there had been no creation or encouragement of a new generation of farmers, nor had family-owned farm operations in BC been sustained. Also, by 2005, over 30 years after the establishment of the ALC, over 55% of farmers in BC were supplementing their farm incomes with off-farm jobs. The Fraser Institute (Katz, 2009) even claimed that the ALC was instrumental in manipulating the farmland inventory to cause higher land prices, an opinion that continues to resonate through the press in recent years (Globe and Mail, Nov, 2016).

Empirical observations of actual farming activity might lead to conclusions that farming is not being enhanced to any significant degree in the City of Kelowna,

especially in the KLO-Benvoulin block. Recent data on farming production, quality and growth are not available for the local Kelowna area or the specific study blocks. What is known for BC, is that 25 to 50% of the ALR is not actively farmed at any given time. (Katz, 2009). Based on field observations, recent orthophotos and comments by farmers/landowners and the District Agrologist, it appears the higher end of this range is likely the case for the KLO-Benvoulin Block, whereas for the South Lakeshore block, it appears that closer to 25% of the area is not being farmed. Relative to the criteria set by Katz (2009), farming in the Kelowna inner fringe has not been advanced to any significant degree. In the KLO-Benvoulin block agriculture has in fact regressed since before the ALR was introduced. In the case of the South Lakeshore block, capital investment by the two main operations has yielded improvements such as major new buildings and infrastructure in areas such as organic food and wine processing, but some lands remain underproductive. The KLO-Benvoulin block faces the greatest challenges from pressure for urban development, which has translated into less advancement in farming, with the Day's Farm being a significant exception. Comparisons between the two blocks provide insight into the sustainability of farming and the viability of farms in Kelowna.

6.2.1 KLO-Benvoulin Block

Interview responses from farmers align with the quantitative findings about the challenges of farming in this area. The physical limitations of the wet soils (even though Class 3 and 4), supports the claim that the variety of crops that can be grown in this area is minimal. Only one large orchard operation known as the Days Farm has benefitted from several generations of dewatering. Other properties are still

subjected to poor soils and are too expensive too dewater for the (financial) benefit that would be derived. These property owners are therefore challenged by economic disincentives, especially when coupled with competition from cheaper imported products. Nevertheless, because of their location close to the urban edge, the speculative value of their land has risen to unprecedented levels. Definitive studies (Livanis et al, 2006) clearly illustrate that there is a speculative component of urban pressures that increase agricultural rents, and that farmland values represent current value of future agriculture, and potential development rents. In turn, these speculative forces of potential development have caused many inner rural-urban fringe agricultural parcels to sit idle, awaiting the conversion potential to be realised by owners of properties characterised by high cost and low agricultural return.

The landscape of the KLO-Benvoulin block has changed in the last two decades. There are many non-farm uses, tree fruits are losing ground, crop farms are almost non-existent, and the urban influences are significant. This has caused landowners to speculate and allow their lands to go idle. Part-time farmers or investor-ownership has dominated this block. In some cases, the properties are leased but only to achieve the minimum requirements for the farm tax status. (This comes from interview accounts in Section 4.3.5) In many cases, the tax breaks have only benefitted the wealthy investors and speculators that are receiving considerable tax breaks not meant for them. Actual farm returns continue to drop. Reinvestment, such as dewatering of the land, purchases of advanced farming equipment, or capital improvements are dismissed as if it is “throwing good money

after bad” (interviews with area farmers, 2016). Another impediment to farming in this block is the parcel sizes. The farmers claim that there are not enough small farms that can sustain intensive organic crop farming. This insight also suggests that the farmers that have run orchards for decades do not understand, or are unwilling to start, intensive crop gardens or farms.

Although there is enough documented evidence from the Ministry of Agriculture, academics and professional resources that small farm sizes can generate good profits, and that a farm economy could be supported in agriurbia, few young farmers are being attracted to Kelowna’s inner fringe. Based on a cross-section of the farmer/landowners that were interviewed from this block, these predominantly older farmers are mostly nearing the end of their career. It is expected that in the next 5 to 7 years, the area will see a dramatic shift in farmlandowners, production capability and types of farms. The lack of small and affordable farms will make it difficult to replace the outgoing generation of current farmers. If the older generation continues to hold out hope for the speculative values of their lands, and/or the next generation does not show interest to take over the family farm, farming in the inner fringe will not progress. This does not bode well for the enhancement of farming or the preservation of agricultural land. Acquisition of property by the Indo-Canadian farmers may be a trend that will offset the downward spiral. Their investment, knowledge of running intensive crop farms, and hard work ethic, along with access to market, will be necessary to enhance farming in this area.

6.2.2 South Lakeshore Block

The South Lakeshore block, although surrounded by new and established residential subdivisions, has not suffered from agricultural land loss as much as the other study block. Most of the ALR lands are actively farmed, a significant portion containing vineyards and orchards. The vineyards are associated with two of the largest wineries in the Okanagan, Summerhill Pyramid, located in the block, and Mission Hills, located in West Kelowna. Similarly, the orchards are largely devoted to cherry production and associated with a large tree fruit producer, Sun City Cherries. These large operators have each made extensive capital investments with two wineries and a packing plant, respectively. This value-added development has translated into enhanced farming, including leasing of additional parcels, farm diversification, increased employment, tourism, retail sales, and maintaining the family farms into the next generation.

The higher quality of agricultural soils (Class 1-3) with minor limitations, compared to the KLO-Benvoulin block, can be partially attributed to the farming success of this area. Furthermore, the predominantly large parcels along with the fact that the land has been actively farmed for many years, has helped avoid speculation. The tourist visitation resulting from Summerhill and Sun City Cherries has prompted more farmgate markets to locate here, further complementing the stability of the smaller operators in the area. This is an area that may flourish with agri-tourism activity, considering its anchors, spectacular views and proximity to Okanagan Lake.

Some of the properties suffer from a significant amount of idle land, largely due to the ownership pattern of one family of siblings owning several parcels. The details of this situation are too intricate to explain in this study, however suffice to say that executive style homes, hobby farms and horse ranches occupy some quality soils that are under producing. Although large parcels, they are under the same influence as properties in the KLO-Benvoulin block. There is no current evidence of speculation but the owners are keenly aware of the adjacent residential subdivisions that can result in the increased values of their vacant land. As much as the City of Kelowna is trying to densify the inner city, these outlying areas will continue to be subject to urban sprawl, or at least demand for large residential lots.

The rapid growth in Kelowna continues to show demand for large residential lots, many of which are being developed in south end of the city close to the South Lakeshore block. Maintaining a farming presence on as much of the arable lands as possible will help redirect the residential development interests away from this block.

In summary, using the claims set by Katz (Fraser Institute) as criteria to help determine if farming has been enhanced in the inner fringe, I would suggest that the KLO-Benvoulin block would rate very low. The situation in the South Lakeshore block offers a more optimistic outlook, especially due to the high-quality soils and investment in the value-added production. Nevertheless, one of the largest farmers in this block offered the following opinion: "...fruit is not seen as part of our food security requirements, so these agricultural lands will always be under threat of urbanization."

6.3 Is Urban Sprawl Being Avoided?

To answer this question, it is important to describe urban sprawl in the context of the inner fringe. Urban sprawl can be characterized in its relationship with the ALR, which influences the extent of suburban development, the density patterns of this development and even the leapfrogging of development over pockets of active and undeveloped farmland.

The 2008 ALC/MAL report claimed that the ALR was not only responsible for saving the extent and variety of agriculture from the encroaching development, but that it provided a secondary benefit in that it has served as an urban containment boundary, helping control urban sprawl. This implies that the ALR saved inner city lands, but in fact the ALR may have helped create the present-day extensive suburban developments of Kelowna, with their low density forms of housing and their leapfrogging of the ALR.

There is agreement amongst planners, farmers and developers that sprawl has occurred. Mathematically speaking, the calculations show that the ALR did not control sprawl, but did maintain the urban containment boundary. What is even more important to understand is how the ALR has influenced sprawl through leapfrogging and that the low density residential development in the suburbs has continued to exacerbate the sprawl. Therefore, the greatest amount of sprawl is out in the suburban areas of Kelowna, if sprawl can be defined by distance (from the city centre), density (lot sizes), roads and servicing efficiencies, traffic, and the use or efficiency of land. This sprawl is market-driven in terms of satisfying demand for new development, spectacular views (from the hillsides) and even a desirable

location away from the inner city. This infers that urban sprawl cannot be avoided without stringent policy direction and perhaps, a cultural shift.

6.3.1 Suburban Development

Based on the feedback from developers and city planners, it appears that residential growth has migrated to the outlying areas for several reasons. Developers suggest that the extensive land supply and its low cost have been the main drivers of the suburban subdivisions. Also, the consumer demand for large lots and spacious homes continues to motivate developers and allow them to influence Council decisions to support suburban development projects. The majority of these master planned communities, at relatively low residential densities, also benefit from hillside locations associated views. The distance from home to amenities, shopping or work is still not great enough to cause people to avoid the suburbs. The city planners acknowledge the market influences but also contend that municipal policies have helped subsidize the infrastructure that has supported sprawl. Roadway extensions and infrastructure such as sanitary sewer and water services are being constructed with long term plans to accommodate more development on the outskirts. Although master plans may contain a mixture of housing forms, the short-term developments continue to see mainly low density single family and minor multi-family product. This lack of density translates into low critical mass of consumers and consequently a limited supply of commercial uses or amenities in the suburban neighbourhoods. The sprawl effect is then reflected in greater traffic movements and regular commuting into the inner city. The resulting issues of traffic congestion, pollution, and increased costs of

infrastructure to service the outlying areas are major concerns of city planners as they try to create a liveable and sustainable community.

6.3.2 Density Issue

Both empirical and qualitative findings have suggested that the City has been building at very low density, largely attributed to auto-oriented single family homes. Large lot sizes are inefficient uses of land but it has also been recognized that different forms of housing that can be built at higher densities have been slow to occur in this market. As the population of the City continues to grow at a rapid rate, either more multi-family homes will be needed to satisfy demand or more land will be consumed at single family densities. The challenge will be to address the density factor throughout the city, including in the suburbs. The City of Kelowna is currently attempting to achieve a balance by incentivizing inner city density increases, while still supporting the larger lot suburban homes. It is understandable that the geography of the hillside sites often makes it physically difficult to build higher density residential product, therefore continuing to fuel suburban sprawl.

6.3.3 Leapfrogging

Carrion-Flores and Irwin's description of sprawl and what causes it makes specific reference to "discontinuous or leapfrog development", in which land closer to the urban centre is withheld from development so that it may be developed at a higher density in the future; and differences in land quality such as topography, also lead to leapfrog development (Carrion-Flores et al, 2004). Critics of the ALR in BC have applied the leapfrog concept to agricultural land, whereby the absence of development in these areas leaves pockets of both active and underdeveloped

farmland between suburban areas (Newman, 2015). The situations in the KLO-Benvoulin and the South Lakeshore blocks both show evidence of what is prominent in Metro Vancouver where land that was originally designated to be in the ALR is fragmented and has been abandoned for agricultural purposes, for a number of reasons: because it is too small or otherwise inappropriate for industrial scale agriculture use, because it is being held for speculation, or because it is a land endowed country residence (Condon et al, 2010).

When the leapfrog development pattern described above is combined with low-density forms of residential development, it is understandable that many critics characterize sprawl as unlimited outward extension (Burchell et al, 2002). To return to the question of whether urban sprawl is being avoided, it can be argued mathematically that the the existence of inner fringe ALR that is flat, adjacent to urban services and close to the City's urban centre, could have contained residential development constructed at high enough densities to avoid sprawl into the suburbs for many years into the future. Following this line of thinking, there are several studies that suggest that the preservation of agricultural lands will often interrupt basic economic forces and consequently agricultural land prices, housing prices, cost of commuting and infrastructure (Brueckner and Fansler, 1983). Therefore, one may conclude that urban sprawl in Kelowna has not only not been avoided, but that agricultural land preservation policy is partially causing it, while also fuelling the increased cost of housing and municipal infrastructure.

6.4 Can Small Lot Farming Play a Role to Advance Farming in the Inner City

The logic of small lot farms, especially when they are located near urban markets has been documented in scholarly literature and by senior government authorities including the BC Ministry of Agriculture. However, the feasibility of such small parcels has been questioned in many Agricultural Area Plans and Strategies in BC communities (Status of Agricultural Area Plans/Strategies, March, 2014). More recently, farm feasibility on small or even very small acreages has been supported in Ministry publications and through research conducted at BC universities (Ministry of Agriculture, ND; Mullinix and Falick, 2012 and 2013). Such studies offer insight to the economic potential of small farms by providing empirical evidence of the revenue, profit and margin potential of the operations. The studies' authors qualified the agricultural scenarios by reviewing farms by land size such as, micro farm (under 0.5 acres); small scale farm (0.5 to 2 acres); mid-scale or community farm (over 2 acres); and structure based agriculture (any size). The studies illustrated not only potential for income generation, but the food production and job creation per acre of land. The major hurdle to small lot farms, however, is the concern for fragmentation that would undermine the main provision of agricultural land preservation. Keeping the land parcels in the ALR as large as possible is a critical line of defence for both provincial authorities and local government.

The main objectives for investigating if small lot farming could play a role in the inner fringe have been as follows:

- Farming as much of the land as possible in order to protect the ALR from urbanization;
- Produce local farm product for a growing urban population;
- Mitigate speculation;
- Enhance farming to the point of making it economically feasible.

Between the quantitative findings, theoretical input and feedback from the farmers, there is considerable logic to supporting the concept of small lot farming. Not only are business cases being made for small lot farms, but the arguments support the general viability in the local food movement. Comments from local farmers articulate the demand for local and farm fresh produce, the ability for small organic intensive crop farms, potential for more affordable and accessible farmland for young and new farmers, and the compatibility or transition role that small lot farms could play between urban uses and the large farms or orchards.

As much as there is considerable support for the small lot farm concept, there are also cautions issued by farmers and the city planners. As noted earlier, the threat of farm fragmentation will continue to loom large over any potential to create more small lots in the ALR. The planners even advised that there were already several small parcels available in the ALR to supply the demand. Farmers that are already practicing intensive crop farming raised concerns about potential market saturation and need for farmers to be trained in intensive farming practices. Furthermore, they felt that the economics would only work for certain crops, and that the high cost of land may have already compromised the establishment of small lot farms.

Although it has been shown that there are many factors that would allow small lot farms to succeed, there is still the challenge of reconciling the fact that the promotion of small lots may lead to fragmentation of the agricultural land base. Regardless of positions taken by government, access to affordable farmland is still deemed to be a barrier to entry by young farmers in this province (Dennis and Wittman, 2014). The recent literature describes two general directions to respond to the matter of access to smaller (and possibly more affordable) lots or farm acreages. One subscribes to the notion that agricultural land should not be subdivided and has therefore devoted attention to alternative land access and tenure options. This direction assumes a community based farmland management approach that calls for both sustained and accessible land base as well as continuing generations of farmers to farm the land (Dennis and Wittman, 2014). Numerous models such as land banking have been described and have proven to work in various North American jurisdictions. The second stream of thought regarding solutions to establish human-scale (small farms) are offered by out-of-the-box thinkers such as Condon et al, Miller and Caldwell. Such proposals include mixing small-scale farming with residential uses within the borders of the ALR, for example. This type of thinking advances the notion of how land use planning, urban agriculture and farmland preservation can be integrated to achieve community food strategies on the urban fringe (Caldwell, 2012; Clark, Inwood and Jackson-Smith, 2014; Condon et al, 2010; Perrin, 2013; Raja, 2008).

Kelowna's inner fringe agricultural land presents an intricate dynamic for planning the City. Even if the option of using alternative land access and tenure

models that would avoid further subdivision was taken, more research would need to be conducted to ascertain applicability of the various models in different parts of the City, their financial viability, farmer's support for these models compared to conventional landownership, and their compatibility with urban uses. It appears that something creative must be done over and above the enforcement of the ALR to stave off the speculation of the inner fringe farmlands. Both American and Canadian scholars have advocated that comprehensive land use planning could assist in more effective farmland protection tools. It is these scholars that are also arguing for a next generation of policy efforts to encourage the sustainability of exurban farming that could be more effective by creating stronger ties between farm and non-farm populations. The policies need to be flexible enough to recognize different ways that farmers and food production can adapt to urbanization. Small plot farms warrant attention in future research of the inner fringe agricultural lands. This could also imply that a 'new fringe' may need to evolve where the relationship between food production and the urban environment entails a substantial paradigm shift.

7. Conclusion

Protecting agricultural land within an urban context is challenging. The forces of urbanization in the inner fringes of a growing city such as Kelowna are vying for the same land base that can accommodate farming. The Agricultural Land Reserve (ALR) that has been in effect since the early 1970s has been responsible for helping to protect 40% of the City's land base, much of which could have been lost to urban uses. The agricultural lands that are vulnerable to urbanization are those that are most proximate to the areas that have urban services, access and significant development attraction. In Kelowna, prime examples include the KLO-Benvoulin ALR block and the South Lakeshore ALR block. These are two areas that have provided challenging community planning dynamics for both urban and agricultural uses. The KLO-Benvoulin block that is located immediately adjacent to the City Core Area has experienced the greatest amount of speculation for transition to urban uses. The South Lakeshore block, although further removed from the City's core, is physically surrounded by new residential subdivisions. Both areas have intrinsic aesthetic value to the residents and visitors, but their future may lie in their highest and best use, be it for urban uses as it has been trending in the KLO-Benvoulin block, or for agri-tourism uses in the South Lakeshore block.

Until recent years, the KLO-Benvoulin area lost considerable agricultural lands to expanding roadways, institutional development, churches and extensive seniors and residential care facilities. City staff have noted that policies have changed and enforcement by both the Agricultural Land Commission and the City is now

expected to defend the ALR boundary. However, the considerable amount of idle land and the rampant land speculation suggests that protection of this inner fringe agricultural land will continue to be challenged. The influences of the adjacent city core, speculation and minimal farming interest will prevail if a more creative solution is not found.

The South Lakeshore block benefits from better quality agricultural land and value-added investment, which has resulted in less speculation than in the KLO-Benvoulin block. A large winery and cherry orchard and production operation have translated into successful agricultural enhancement for the area. This situation reflects the idea that a strong agricultural community can serve as defence against the forces of urbanization.

Along with agricultural land preservation and urbanization, an integral element in the City's planning dynamic is that of urban sprawl. All participants that were interviewed agree that it does exist. Although the ALC can claim that the ALR avoided sprawl into the immediate (inner fringe) agricultural lands, it is recognized that intermittent pockets of ALR have influenced leapfrog development into the suburban area. The density tests provide credible evidence of this phenomenon. Nevertheless, the research has verified that not all suburban development can be attributed to leapfrogging. Some of the developers are committed to responding to market interests to develop large lot residential in prime locations often on hillsides, where there are views. This market interest has helped developers articulate the need to create municipal land use policy that reinforces more suburban development.

This scenario of idle agricultural land in the inner fringes, pockets of undeveloped land throughout the community and low density sprawl in the suburbs leads to consideration of a new land use planning policy and regulatory environment. The inner fringe of Kelowna offers opportunity to enhance agriculture while influencing a new planning dynamic for the whole City. If the vision for the City is to maintain a rural presence or even sustain agricultural production within the municipal boundary, protection of agricultural land must win out against the forces of urbanization. To achieve this goal, a new fringe will need to respect farming as a priority in the land use planning framework. A potential solution for enhancing farming in the new fringe could be small lot farms. This study found that the demand for and feasibility of such farms is significant, but the potential to pursue such an option in BC is interrupted by concerns related to fragmentation that could undermine the mandate of agricultural land preservation. Keeping the land parcels in the ALR as large as possible is a critical line of defence for both Provincial authorities and local government. One option that subscribes to the notion that agricultural land should not be subdivided has devoted attention to alternative land access and tenure options. This direction assumes a community based farmland management approach that calls for both sustained and accessible land base as well as continuing generations of farmers to farm the land (Dennis and Wittman, 2014). Numerous models such as land banking have been described and have proven to work in other North American jurisdictions. Nevertheless, this should not preclude further investigation of a mixed land use framework where

small scale farms can work alongside urban areas and further achieve community food strategies on the urban fringe.

This study explored the potential of agricultural land preservation, the forces of urbanization and the influences of sprawl, on the inner fringes of a growing city. In order to better understand how to address the issues that have resulted (e.g. land use disorder, speculation and idle land), it is important to gain an appreciation of the interaction of urban policies and agricultural practices. The analysis of this research is based on professional perceptions of current and past planning policies and agricultural practices from several points of view. While professional insight has merit, there is need to understand the issues more broadly to help make the inner fringe agricultural land part of a sustainable city. The solution seems to be embedded in the concept of an “agri-urban system” as expressed by those such as Valette and Perrin (2012) and Soulard et al (2015). This new and rapidly growing understanding of urban areas finding new ways of living sustainably is gaining traction in Europe. The concept is not only for urban to embrace agriculture in the interest of food security, but it is a means for cities to use agriculture to invent new urban forms. It is essentially a better integration of urban and agricultural dynamics, where community, social, and public thinking see the two yielding the community of the future.

The following recommendations draw from the recent theoretical perspectives that suggest a need to identify and understand city-agriculture relationships, and analyze their dynamics. This includes a consideration of the roles played by various actors and the relevant forms of governance, as well as reflection of the input

provided by the City of Kelowna planners and farmlandowners. It was the landowners (both practicing farmers and speculators), that most recognized a need for a creative solution to be found soon for the inner city agricultural lands.

7.1 A New Urban Strategy

The link between emerging agriculture practices and urban food security policies is only just beginning to materialize. Kelowna, and cities like it, should embrace this concept in its future urban planning where food security strategies seek to renew and strengthen links with local agricultural production. In the interest of protecting farming in perpetuity within the city, the future urban strategy should consider more definitive area sector planning and agricultural zoning. The Official Community Plan does not suffice to enact the long term thinking for directions that come out of the farming community, Agricultural Plans or business models that are supporting urban farming. Future investigation should search for the best means to address food production and agricultural practices as part of the land use planning framework in the City.

7.2 The Science of Farming and Support for Farmers

The Agricultural Land Reserve is premised on protecting high quality farmland in BC. In the case of the inner-city lands of Kelowna these include agricultural soils with a CLI rating of class 1 to 4. The KLO-Benvoulin ALR block contains approximately 1,300 acres of land where farmers and landowners suggest there are both farming challenges and opportunities. The challenges are causing some of the landowners to pursue exclusions, non-farm uses or leave their land sit idle. The speculative forces that result are compromising the potential farming opportunities.

Two important solutions may help to address these challenges. One is the need to verify the CLI ratings where dewatering of lands has not occurred and consequently left the soils with minor capability for agricultural production. This will likely require Ministry of Agriculture involvement and ALC support. Fine-tuning of the ALR boundary may be a result, or consideration of a funding assistance program to improve the CLI rating especially with dewatering. It should be noted the the possible implications of climate change on wetness of soils was not explored in this study. Natural dewatering/drying of the soils could create improved ratings.

The second matter involves the means of assisting farmers (new and existing) to farm productively using sustainable practices. This especially applies to enhancing the farming of vegetable crops where orchards once prevailed. It also implies learning or transferring of knowledge so that farmers can apply the best science and technology to maximize production.

7.3 Defining the Area

The inner fringe agricultural lands have become zones of planning contention and land use conflict (Condon et al, 2010). If this area is deemed to have potential for human-scale agri-food production and smaller farm lots, an important investigation will be the determination of what or where is the agricultural resource to preserve and what is a legitimate 'urban area in waiting' (Caldwell, 2002). City planning staff interviewed have insinuated that past policy regimes were responsible for poor planning decisions regarding land use, the density of residential development projects, and the locations where land was released from the ALR or simply allowed to be developed on the edge of the ALR. Extensive areas

were developed at relatively low densities, using up valuable agricultural land while exacerbating sprawl. To avoid these types of poor planning in the future, more fine-tuned and strategic site location planning will be required for both urban and rural uses. The intent is to secure local buy-in and achieve compatibility between urban and agriculture activity. This is more than just preserving the most fertile agricultural lands in an urban area; this is about advancing a strategy for urban agriculture, green space and liveability where urban and peri-urban agriculture practices can coexist.

7.4 More Small Lot Farming

The opportunities for small lot farms within the City should not be discounted despite the concern over fragmentation. The justification for supporting such farming practices is very strong, recognizing economic feasibility, land efficiencies, young and new farmer demand, and the rising popularity of the local food movement. There is enough evidence in BC, other parts of Canada and the USA to show the significant contribution of small lot farming for the entire agriculture economy. Furthermore, it has been recognized as the face of agriculture for urban consumers. The intensive farming practices and crops that the small farms support make sense on underutilized ALR lands in an urban setting. The potential of this type of farming continues to be promoted by government, researchers and the farming community (Mullinix and Falick, 2012). Further research and investigation regarding the potential to support such small-scale farms in Kelowna would be required. This implies the need to consider locations for compatibility with urban areas as well as ability to ensure that the lands would be protected in perpetuity for

agriculture. Caldwell (2011), Miller (2013), and Condon et al (2010), are all arguing for human-scale food production and smaller lots, especially on urban edges, but they also recognize that these areas are zones of planning contention and land use conflict. Further investigation with all appropriate stakeholders could explore opportunity for small lot farms and local food production while achieving a rural aesthetic within the City.

7.5 Alternative Land Tenure

Farmers in BC, including some of those that were interviewed believe that one of the best ways to protect agricultural land is by farming it. (Agricultural Advisory Committees Workshop, February, 2015, Langley, BC; attendance by author). This decreases the speculative influences and provides opportunity for value-added production as was found in the South Lakeshore block. If subdivision of the inner fringe lands continues to be prohibited or limited under ALR legislation , other means to access farmland will be required. Alternative farmland tenure has been proven to work in many other jurisdictions in North America by successfully addressing the main barriers to entry for young and new farmers. Dr. Hanna Wittman's work at UBC's Centre for Sustainable Food Systems at the UBC Farm has found that community-based farmland management could maintain a sustained and accessible agricultural land base as well as continuing generations of farmers to farm the land (Dennis and Wittman, 2014). To accomplish this, there will need to be a shift in cultural attitudes regarding the long-term stewardship of the land (Miller, 2013).

Honey (2014) provides an overview of approaches used in other jurisdictions, that may be applicable in BC. Some of these include incubator farms, land linking, cooperative farming, farmland trusts, life estate leases, and community farms. Each of these models have pros and cons that would need to be investigated for direct application to growing cities with agricultural and urban land use conflicts such as Kelowna. Regardless, if any of these models can enhance farming, attract a new generation of farmers, support sustainable farm practices and support the needs of a growing city, there is merit to create localized forms of community based farmland management. The power of these models is in the fact that they are in keeping with agri-urban concepts such as what is being promoted by scholars like Valette and Perrin (2012). Kelowna should embrace the idea of using agriculture to invent new urban forms, thus creating a new or enhanced way of living sustainably. One or more of these models may not only support inner fringe agriculture but also place Kelowna on the top tier of sustainable cities in North America.

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APPENDIX Interview Guide

Interview Questions/Discussion Topics

There are three sample groups that have been chosen as participants for this study. Structured interviews will be used for the three groups. Key questions and discussion topics are noted below for each group. Base information about each participant is collected at the beginning of the interview.

(1) CITY PLANNERS

Name

Position at Municipality

Years in Service

Knowledge of the ALR/ALC Legislation

A. Urban Sprawl /Policies

1. Do you believe your community /region suffers from urban sprawl? If so, what may be causing it?
2. What land use policies does your municipality use to avoid urban sprawl today?
3. Do you believe your municipality should be enacting more/other policies to curb sprawl?

Probe:

Describe a few that you feel could be applicable to Kelowna and area

Degree of aggressiveness of policies

Can you comment on the 'incentivizing' approach that the City is initiating?

B. Infill and Density Factors

4. Do you feel that there are opportunities to increase densities and infill of lands in the inner fringe that could help slow or curb sprawl?
5. Are there any particular areas?

Prompt if necessary

6. What land use and density factors would you recommend for the infill areas?

Prompt with examples:

- Small lot residential
- Low density townhouses
- Medium density MFR (up to 4 storeys)
- Low rise Multi unit (5-11 storeys)

- High rise towers (12+ storeys)
- Mixed use (commercial /residential)
- Other (commercial, etc)

C. Impact of ALR on Sprawl

7. Do you feel that the ALR that is located within the inner fringe (describe location) is causing or influencing sprawl due to leapfrogging?

Probe:

How significant is this issue in your community? Has it changed over time and under different councils, policy regimes or economic conditions?

8. Do you feel some agricultural land within the inner fringe should be sacrificed to address the continued leapfrog effect?

Prompt:

Even if conditions/caveats must apply?

Probe:

That is: different CLI rating; different areas; in phases; based on a strategy or an area plan?

D. Implications of Sprawl

9. What do you believe are the economic implications of continued sprawl in your community? And the environmental implications?
10. Do you believe the City can avoid sprawl while protecting all, some or most ALR in the inner fringe?

Prompt:

Feel free to talk about it in planning terms, actual areas, development trends, political perspectives, etc.

E. Small Lot Farming

11. Small lot farming has been identified in many jurisdictions as an excellent means to address food security, food quality and sustainability practice in urban areas. What are your thoughts with regard to introducing policies to allow smaller lots that would permit high yield farms in the inner fringe of Kelowna?

Prompt and Probe:

The issue of fragmentation versus farmland preservation is one of the only issues standing in the way of small lot farming in this province. But changes may be coming through leases, special zoning, and other approaches to support the rising demand for local food production. Can we introduce creative approaches for small

lot farms that has the potential to address the disorder in the inner fringe ALR where contestation between urban and rural is the greatest?

F. Interview Closure

Other comments

Follow Up

Thank You Very Much for Your Time

(2) FARMER/LANDOWNERS (INNER FRINGE PLAYERS)

Name

Address

Years of Ownership

Land in Production/Farmed

Developer/Farmer/Investor/Other

Knowledge of ALR/ALC Legislation

A. Potential Development Perspective

1. You have been identified as a landowner of strategically located ALR land in the inner fringe. Regardless of whether your land it is being farmed this year, what are your expected timelines for urban development to be achieved?

Prompt and Probe:

- Short term (1-3 years)
- Medium term (4-9 years)
- Long term (10+ years)
- Never

2. If you could develop your land with full urban services, say over the next three years, what do you feel is the highest and best use for the land?

Prompt and Probe:

- Land use
- Density
- Form (includes mixed use)
- Includes some agricultural component

3. Does your land lend itself to a phased development pattern, where a portion is protected for agricultural use until demand warrants changes to urban uses?

Prompt and Probe:

Area immediately adjacent to municipal services, high density zone and main roadway?

4. Your land has been in the ALR since 1973, but is now surrounded or encroached upon with urban services, roads and urban land uses. What is your attitude towards

continued agricultural status (of your land) to protect the integrity of food security in the region?

Prompt:

- It is terrible land for agriculture
- It has been extremely hard to lease for agriculture
- Agricultural economics are not in my favor
- There are too many urban influences to maintain a farm
- It will come out of the ALR, sooner or later; in the meantime, it just sits idle or with minimum agricultural use
- There are some viable agricultural uses that can be sustained on the land

B. Supporting Agriculture Perspective

5. How do you believe agricultural /land use policies should /could be changed to further protect and encourage agricultural practice in the inner fringe ALR?

Prompt:

Please think about short term and long term; economic implications; actual farming practices; City's development approval process and zoning, etc.

6. Do lands such as yours have potential to produce high yield crops considering their location?

Probe:

What are some of the necessary conditions that must prevail? Type of crops?

7. What are your thoughts with regard to introducing policies to support small lot farming in the inner fringe?
8. Do you see any potential to preserve some agriculture use on your land, within a comprehensive plan of urban uses, open space and agricultural production?

C. Inner-city development versus suburbs

9. What value or potential do you see in developing inner city lands versus development of suburban subdivisions in and around Kelowna?

Prompt:

Think about sprawl, environmental impact, economic implications, social implications etc.

D. Interview Closure

Other comments
Follow Up
Thank You Very Much for Your Time

(3) DEVELOPERS (SUBURBAN AREA PLAYERS)

Name
Location/project
Years of Ownership
Zoning/Master Planned
Approved Build Out
Where else land is owned

A. Developer Philosophy

1. The suburban communities located on the outer edge of Kelowna or in other areas of the Central Okanagan Region are still in demand. What are the main market motivators?
 - Price
 - Product (House/Lot)
 - The suburban location
 - Sense of community
 - No interest in inner city living
 - All of the above
 - Other _____

2. How would you compare your development to the inner city products that may be similar in price or design to yours?
 - No comparison
 - Much more home for the money
 - Just a different location
 - Maintains long term value
 - Nothing like ours is available anywhere
 - Other _____

B. Product Description

3. How many more years of build out/units remain in your land development project? (approved/not approved) How has phasing occurred (by area, product type, major service level and access)

4. Some planners would categorize your project as urban sprawl. If land was available in the inner fringe, could Kelowna avoid some of the sprawl affect similar to your project? If so, what residential densities in your opinion should be applied to the inner fringe lands?
5. Many of the suburban developments have a minor amount of MFR that supplement the traditional SFR; is there a magic formula for the amount of MFR that can be accommodated in the suburban neighbourhoods versus keeping most of the multiple residential units in the inner city?

C. Challenges and Benefits of Developing in outlying areas

6. Can you comment on the development economics for SFR, MFR and commercial uses in the outlying areas ?

Prompt:

Think about cost per door or square footage of commercial space, including extension of services to outlying areas.)

7. What is your opinion about the leapfrogging over ALR that is occupying the inner fringe? Should the ALR in that location be protected at all cost?

Probe:

Please comment regarding any particular location, phasing or policy implications.

D. Interview Closure

Other comments

Follow Up

Thank You Very Much for Your Time