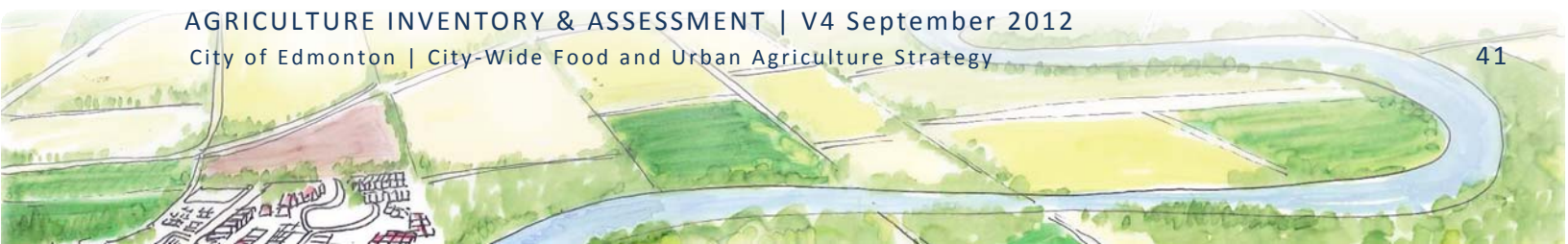


3. Farming and Farmland

While the previous section of this Inventory describes the suitability of the UGAs for agricultural activities, this section explores actual land uses and farming practices. Due to limitations of available information, a mix of data sources and methods has been used to derive this data in an effort to triangulate what is happening “on the ground”. These methods include analysis of 2006 and 2011 census data, 2011 Assessment Authority data, and visual interpretation of air photos. Key results include the following:

- Like most large Metropolitan areas in Canada, the City of Edmonton has been experiencing the loss of farms and the conversion of land from agricultural to urban uses. Between 2006 and 2011, the number of census farms (a farm, ranch or other agricultural operation producing agricultural products for sale) decreased by 57%. The same census period comparison indicates an 80% decline in the area under agricultural operations since 2006. However, some of this apparent loss of farming area is explained by Statistics Canada’s “headquarters rule” that guides how data is collected and reported. The City’s zoning and tax assessment records indicate that a more modest 15% of the City’s farmland was converted to urban uses between 2006 and 2012.
- Based on 2006 and 2011 census data, land tenure has shifted somewhat in Edmonton, with the share of agricultural land owned by the operator decreasing from 60% in 2006 to 43% in 2011. This shift leaves leased and rented farmland as the predominant form of tenure for Edmonton’s agricultural lands. However, 57 of 73 farm operators report owning at least some of their land. Lease/rental arrangements are sometimes a form of agricultural risk management as leasing land represents a less capital-intensive means of expansion. In some cases, retiring or downsizing farmers may wish to retain ownership of their land but not work it themselves. In other cases, investors or non-farmers acquire farmland and lease/rent it out to earn a return on their investment until the land can be more intensely developed (Statistics Canada, 2012).
- Remaining farms report higher profitability when measured on a per farm and per acre basis.
- Weeks of paid labour are significant – Census of agriculture 2011 states that 28 farms in Edmonton reported they had 241 paid employees in 2010, and those 28 farms reported 6,717 weeks of paid work in agriculture (equivalent to 129 year-round full time positions).
- Greenhouse horticulture appears to be the only category of farming that has not declined significantly since 2006. Based on census data, within greenhouses, the past several years have included a shift from flower to vegetable growing, although flowers remain the dominant product of Edmonton’s greenhouse industry.



- Based on census data, the average age for a farm operator in Edmonton was 58 years old in 2011, up slightly from 2006. This remains higher than the Provincial average of 55. This is the first time in Canadian history that the majority of farmers are over the age of 55.
- Assessed land values are higher in some UGAs than others, ranging from \$7,000 to \$14,000 per acre. Although part of this cost difference may depend on the value of improvement to the land, such as improved drainage infrastructure and existing facilities. It is important to note that the assessed value of land is not equivalent to the market price of land especially agricultural land where market prices are often 7-11 or more times the assessment value. Market price is also inversely related to parcel size – the larger the parcel, the lower the per-acre price and vice-versa (e.g. a full quarter section will have a lower per acre price than a smaller subdivided parcel).
- The current average parcel size for agricultural land in the UGAs is 17.4 hectares (43 acres). This average size is considerably larger than non-agricultural uses, which average at less than 1.9 hectares (4.8 acres) including rural residential parcels that average 0.6 hectares (1.4 acres).

3.1 Farming Activities and Trends

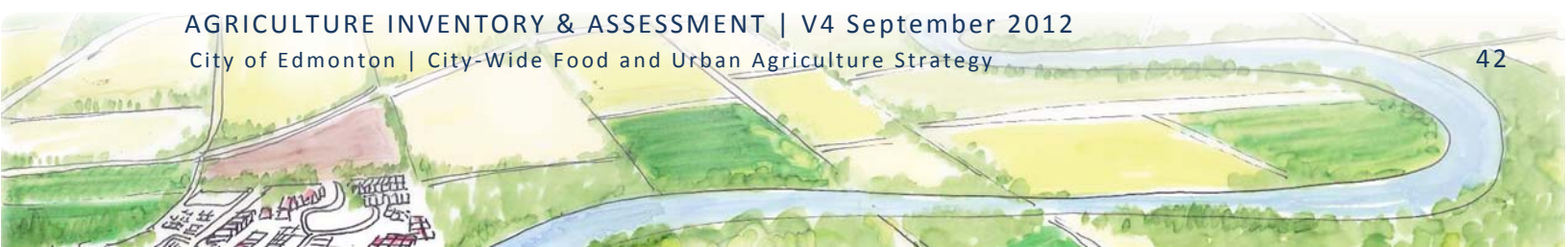
This section analyzes trends in farming activities in Edmonton based on the 2006 and 2011 Census (Statistics Canada, 2006; Statistics Canada, 2011a). Where appropriate, comparisons to Provincial and National trends in agriculture are made.

The advantage to census data is that it can provide a description of change over time and allows comparison of these trends to the Provincial scale. However, census data doesn't necessarily correspond to what is happening within the UGAs. The figures cited in this section should therefore be seen as an indication of trends in Edmonton a whole. Subsequent sections of this Report seek to establish a picture of agricultural activities within the UGAs based on alternate data sources (air photos and information from Edmonton Assessment).

In interpreting census results, it is important to note that farms can be classified by primary activity (in which case each farm is counted only once) or by each activity in which they are engaged (which allows farms with multiple crop-types to be counted more than once). This means that the number of farms engaged in all farming activities combined can exceed the actual number of farms in some of the tables below. Tables measuring primary activity (farms counted once) are labelled as such; other tables may count activities and due to multiple reporting, may exceed the total number of farms.

3.1.1. Farm Count and Area

In Edmonton, the total number of farms reporting agricultural activities has decreased from 170 farms in 2006 to 73 farms in 2011, a 57% decrease over the five-year time period.



Census of Agriculture uses NAICS (North American Industrial Classification System) classifications to classify farms by 'farm type'. Farm types are a measure of the predominant agricultural activity (51% or greater) generating income on a farm. Most farms produce a range of crops, livestock, food products and/or services for sale. Using farm types, an indication of the predominant agricultural activity can be determined within a given geographic area.

The 2011 Census of Agriculture reported that farm types of: a) oilseed & grain farming, and b) cattle ranching and farming, have seen the largest decrease in number of farms reporting this type of economic activity since 2006 (see Table 11). Please also refer to Appendix D for further detail on farm counts and production trends by commodity group.

Table 11 Farm Counts by NAICS Farm Type.

	City of Edmonton			Province of Alberta
	2006	2011	Change	Change
Oilseed and grain farming	55	11	-80%	+1%
Other animal production	27	20	-26%	-14%
Cattle ranching and farming	26	3	-88%	-41%
Greenhouse, nursery and floriculture production	24	20	-17%	-9%
Other crop farming	24	12	-50%	+75%
Vegetable and melon farming	5	4	-20%	-3%
Fruit and tree nut farming	5	1	-80%	-33%
Poultry and egg production	2	2	0%	-19%
Sheep and goat farming	2	0	-100%	-12%
Hog and pig farming	0	0	0%	-68%
Total	170	73	-57%	-13%

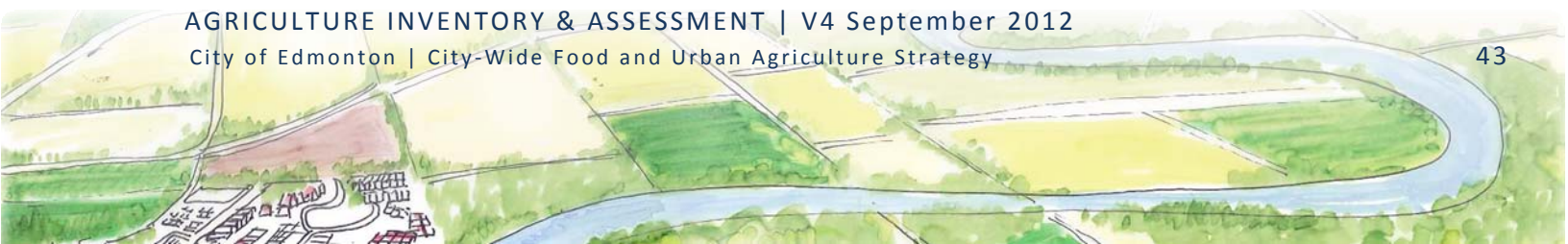
Source: Census of Agriculture 2006, 2011.

According to the census, the total farm area in Edmonton has decreased by 80% from 66,584 acres (26,966 Ha.) in 2006 to 13,011 acres (5,269 Ha.) in 2011(see Table 12).

Table 12 Number of Farms, Farm Area, and Average Farm Size based on Primary Activity.

	City of Edmonton			Province of Alberta
	2006	2011	Change	Change
Total Number of Farms	170	73	-57%	-13%
Total Area (workable & non-workable) (Acres)	66,548	13,011	-80%	-3%
Average Farm Size (Acres)	391	178	-54%	+11%

Source: Census of Agriculture 2006, 2011.



In contrast to the 80% decrease shown by census data, the City's zoning and tax assessment records indicate that only 15% of the City's farmland has been converted to urban uses between 2006 and 2012 (see **Error! Reference source not found.**). Some of this decrease reported in the census can be attributed to Statistics Canada's "headquarters rule" which means that key farm data, such as farm size/area, is based on the location of the legal headquarters of a farm, not on the location of the farm land itself (Statistics Canada, Personal Correspondence 2012). As many agricultural operations include numerous parcels of land in different locations, a significant portion of the decline measured by the Census may be driven by farms with headquarters located in Edmonton but farm land in other jurisdictions

The average farm size in Edmonton has fallen from 391 acres in 2006 to 178 acres (72 Ha.) in 2011 (see

	City of Edmonton			Province of Alberta
	2006	2011	Change	Change
Total Number of Farms	170	73	-57%	-13%
Total Area (workable & non-workable) (Acres)	66,548	13,011	-80%	-3%
Average Farm Size (Acres)	391	178	-54%	+11%

Table 12

). Changes in farm size are also reported in the Census of Agriculture 2011. The number of farms in all

	City of Edmonton			Province of Alberta
	2006	2011	Change	Change
Total Number of Farms	170	73	-57%	-13%
Total Area (workable & non-workable) (Acres)	66,548	13,011	-80%	-3%
Average Farm Size (Acres)	391	178	-54%	+11%

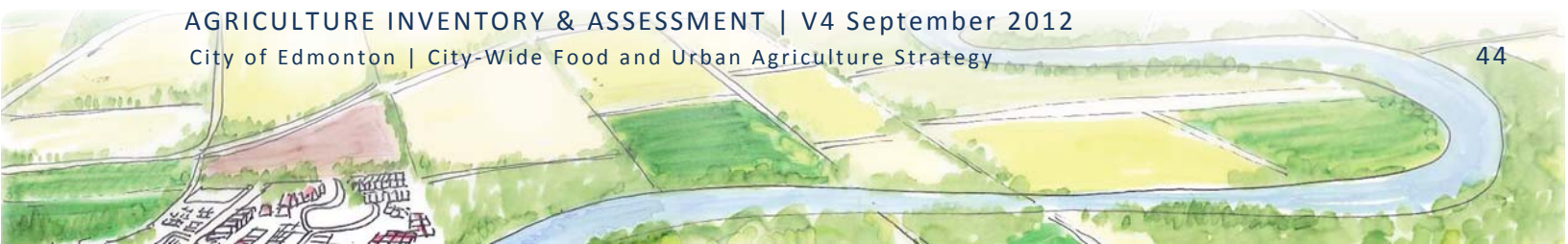
sizes larger than 10 acres has declined in Edmonton. Small farms of 10 acres or less have increased slightly in number indicating subdivision of larger parcels. Larger farms have declined the most in number of farms reporting. In 2006 there were nine farms larger than 1,600 acres; in 2011 there were three. Figure 7 summarizes farm size changes from 2006-2011.

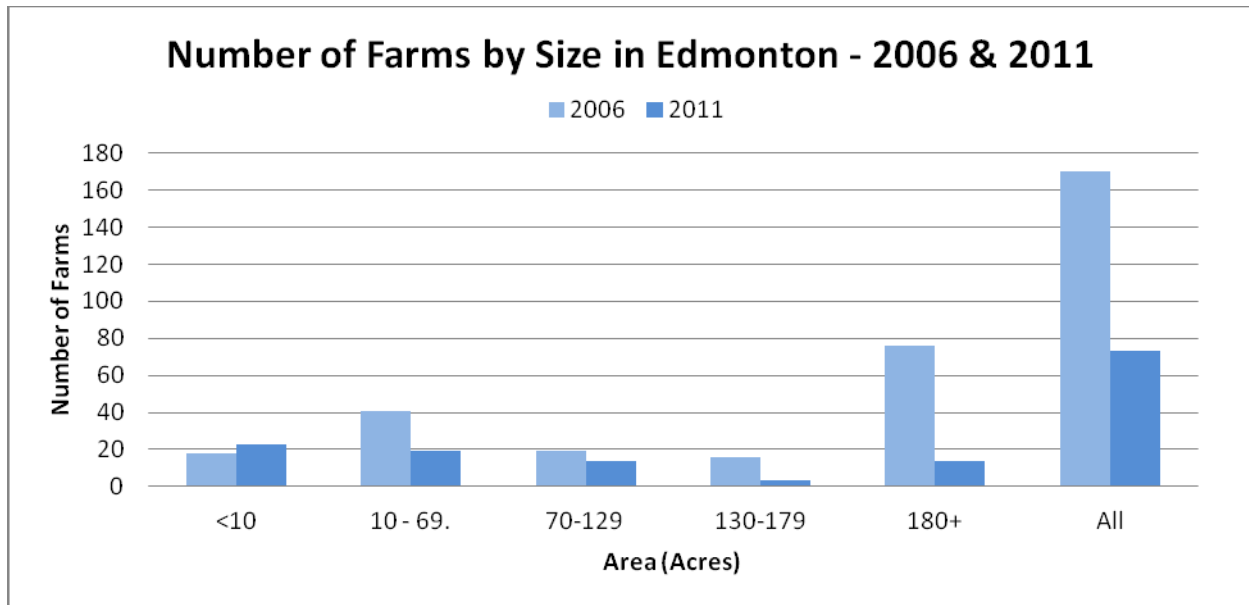
Table 13 City of Edmonton Agricultural Assessment and Zoning.

	City of Edmonton		
	2006	2011	Change
Land Assessed as Agricultural (Ha.)	34,891	29,613	-15.13%
Land Zoned as Agricultural	30,399	26,160	-13.94%

Source: Sustainable Development Department, City of Edmonton. August 2012.

Figure 9 Distribution of Farms by Area (Acres) in Edmonton Based on Census Data.





Source: Census of Agriculture 2006, 2011.

3.1.2. Farm Ownership

Land tenure has shifted somewhat in Edmonton when compared to the Provincial average. According to the Census of Agriculture data for 2006 and 2011 (shown in Table 14), over three quarters of the farm operators owned their own land; a slight decline since 2006. Land tenure is reported by a number of variables including: total farmland area owned, rented, leased, crop-shared and other business arrangements used 'from' others. Land tenure is also reported for farmland area rented/leased, crop-shared and other business arrangements used 'by' others. Land tenure variables cannot be totalled due to multiple reporting.

In 2011, 57 out of 73 (78.1%) farm operators within the city limits reported owning land (shown in Table 15). By comparison, in 2006, 148 of 170 (87.1%) farm operators reported owning land within the City of Edmonton.

Of the total farmland area, farm operators reported in 2011 owning just under half of the total farmland area (49.3%) which was a decline from 2006, when farm operators within the city limits reported owning 62.2% of the total farmland area.

Since 2006, the proportion of total farmland within the City of Edmonton used by others has remained constant. In 2011, 12 out of 57 (16.4%) of farm operators reported land rented/leased or used by others. In 2006, 28 out of 170 (16.5%) farm operators reported land rented/leased or used by others. Of the total farmland area, the percent of farmland area used by others in 2006 and 2011 increased from 5.8% to 14.8% respectively.

Table 14 Land Tenure Types in Edmonton and Alberta.

Land Tenure Types		City of Edmonton			Province of Alberta		
		2006	2011	Change	2006	2011	Change
Land Owned	farms reporting	148	57	-61.5%	47,490	41,539	-12.5%
	acres	41,418	6,416	-84.5%	32,228,183	30,233,516	-6.2%
	hectares	16,761	2,596	-84.5%	13,042,281	12,235,068	-6.2%
Land Operated	farms reporting	170	73	-57.1%	49,431	43,234	-12.5%
	acres	66,548	13,011	-80.4%	52,127,857	50,498,834	-3.1%
	hectares	26,931	5,265	-80.4%	21,095,393	20,436,150	-3.1%
Land Used by Others	farms reporting	28	12	-57.1%	7,852	7,827	-0.3%
	acres	3,833	1,929	-49.7%	2,304,474	2,425,562	+5.3%
	hectares	1,551	781	-49.7%	932,587	981,590	+5.3%

Notes: Land Tenure variables cannot be totalled due to multiple reporting.

Source: Census of Agriculture 2006, 2011.

Table 15 Land Ownership and Use by Others in Edmonton.

Land Tenure Uses		City of Edmonton		
		2006	2011	Change
Total Area of Land Owned	Percent of Farm Operators that owned land	87.1%	78.1%	-9%
	Percent of Farmland Owned by Operators	62.2%	49.3%	-12.9%
Total Area of Land Used by Others	Percent of Operators reporting Land Used by Others	16.5%	16.4%	-0.10%
	Percent of Farmland Used by Others	5.8%	14.8%	+9%

Source: Census of Agriculture 2006, 2011.

3.1.3. Farm Receipts, Expenditure and Profitability

Census data indicates that net profit for Edmonton's agricultural sector as a whole declined between 2006 and 2011 as expenses rose at a faster rate than gross farm receipts. However, profit per acre increased and profit on a per farm basis remained relatively stable. This suggests that some farms operating on the margins of profitability may have ceased operation, and the remaining farms are more profitable when measured on a per farm and per acre basis (see Table 16). It is also evident that commodity prices since 2008 have been at historically unprecedented highs, and the consumer demand for locally produced agriculture and food products has increased since 2006, a trend that is noted provincially and nationally.

Table 16 Farm Receipts and Profitability in Edmonton.

	2006	2011	Change
Total Gross Farm Receipts Excluding forest products sold	\$28,737,396	\$35,356,105	+23%
Total Farm Business Operating Expenses	\$23,434,931	\$30,770,695	+31%
Net Profit	\$5,302,465	\$4,585,410	-14%
Total Area of Workable and Non- Workable Land (Acres)	66,548	13,011	-80%
Number of Farms	170	73	-57%
Profit per Acre	\$ 80	\$352	+340%
Profit per Farm	\$31,191	\$ 62,814	+101%

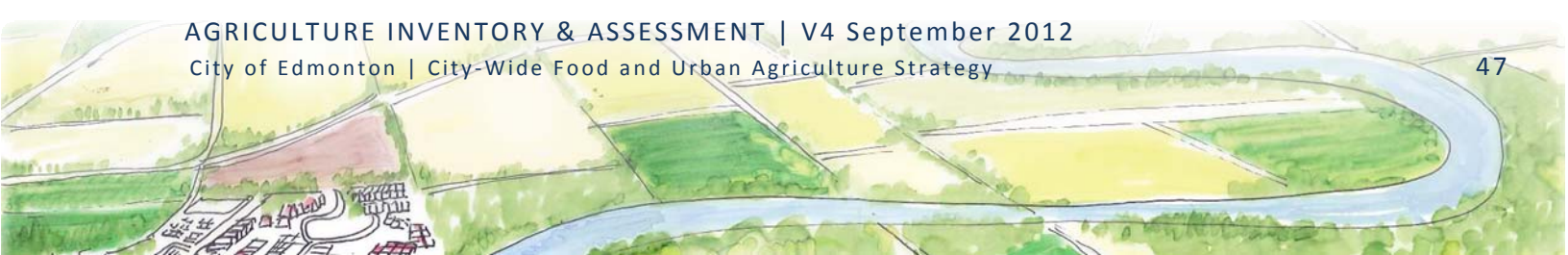
Source: Census of Agriculture 2006, 2011.

Increasing commodity prices in certain sectors as well as increased costs of fertilizers, fuel, seed and livestock feed affected the farming community in Alberta and in Canada as a whole. Table 17 shows select operating expenses for Edmonton’s farms. Fertilizer expenditures per acre have risen dramatically, potentially representing both increased fertilizer prices and a shift to more intensive forms of production (e.g. greenhouses). Absolute fertilizer costs represented 2% of total farm business operating expenses in 2011 a decline over amounts reported in 2006 when 6% of total operating expenses were attributed to fertilizers. Additional increases in the costs of custom work & trucking fees, fuel, and depreciation costs in 2011 compared to 2006 were reported for Edmonton.

In addition, wages paid per week of labour have risen by 43%. This brings wages per week of work 19% higher than for Alberta as a whole. Of the 73 farms reporting within the City of Edmonton, 28 reported in 2011 of having 241 paid employees and a total of 6,717 paid weeks of labour in 2010. Agricultural operations in Edmonton in 2010 were a significant employer of seasonal workers and full time employees, generating over \$5.35M in salaries and wages.

Table 17 Selected Farm Operating Expenses in Edmonton.

	2006	2011	Change
Total Farms	170	73	-57%
Total Area (Acres) Includes workable and non-workable land	66,548	13,011	-80%
Total Weeks of Paid Work	7,434	6,717	-10%
Wages and Salaries Paid	\$4,156,070	\$5,352,840	+29%



Wages per Week of Work	\$559	\$797	+43%
Wages per Acre	\$62	\$ 411	+559%
Fertilizer and Lime Expenditures	\$1,410,099	\$683,362	-52%
Fertilizer Costs per Acre	\$21	\$53	+148%

Source: Census of Agriculture 2006, 2011.

3.1.4. Farm Demographics

Across Canada, the average age of farm operators has been increasing (Statistics Canada, 2011b). Average age for farm operators in Edmonton is 58, higher than both Provincial and National average of 54.5 and 54 years, respectively. The trend in increasing average age of farm operators means that proportionally, over time, fewer young farmers and ranchers are entering the agriculture sector. The impact on the agriculture and food sector is that there is greater risk of losing a wide range of knowledge, skills and adaptive management and capacity as farmers retire and/or exit from the industry. Agriculturally-related research and development, as well as technological advances are also at risk of decreasing as competition for funding and investment shifts elsewhere to other sectors/industries and occupations. The impact for society is that the resiliency of the agriculture and food system is reduced over time and between generations.

Table 18 Average Age of Farm Operators in Edmonton.

	2006	2011	Change
Average Age	57.5	58.0	+1%

Source: Census of Agriculture 2006, 2011.

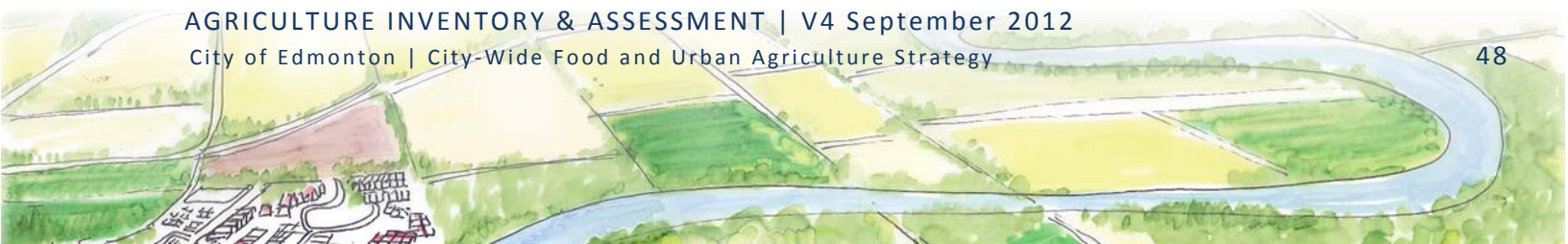
3.1.5. Trends in Field Crops and Vegetables

Both the number of farms and the land area associated with the production of the top 10 field and vegetable crops decreased in Edmonton, the latter by 10,271 hectares (25,380 acres), or 73%, from 2006 to 2011. Canola and Alfalfa decreased 73% and 78% in area respectively from 2006 to 2011. Vegetable-producing farms as a whole decreased 42% in area; the exception is farms reporting beet crops, which increased in area but remained a small share of total area.

In the Province as a whole, total field vegetable area decreased 19% between 2006 and 2011. This is a much smaller decrease than that experienced in Edmonton. Please note that Table 19 represents a count of reported activities, not just primary activity. Some farms will have multiple activities and therefore may be counted more than once in the total number of farms.

Table 19 Top 10 Products by Activity Count and Area in Edmonton.

<i>Based on secondary activity</i>	2006		2011		Change	
	Farms	Hectares	Farms	Hectares	Farms	Area



Wheat (Includes Spring and Durum)	34	4,152	9	1,596	-74%	-62%
Canola	37	5,219	8	1,411	-78%	-73%
Alfalfa and alfalfa mixtures	46	2,167	15	471	-67%	-78%
Barley	29	2,270	6	268	-79%	-88%
All other tame hay and fodder crops	20	273	8	110	-60%	-60%
Cucumbers	6	12	4	6	-33%	-50%
Beets	5	4	4	6	-20%	+50%
Green peas	7	6	4	4	-43%	-33%
Sweet corn	5	27	4	16	-20%	-41%
Carrots	6	29	4	-	-33%	-
All	195	14,159	66	3,888	-66%	-73%

Source: Census of Agriculture 2006, 2011.

3.1.6. Trends in Greenhouses

Although more than one third of the number of farms reporting greenhouse activity in 2006 did not report such activity in 2011, the area used for greenhouse production declined by only 6%. Greenhouse production is area under glass, plastic or other protection as shown in Table 20.

Flowers remain the dominant greenhouse product. However, the share of area devoted to flowers declined while the area devoted to vegetable production and other greenhouse crops increased almost seven-fold. At the Provincial scale, total greenhouse vegetable area increased 33% between 2006 and 2011 (Statistics Canada, 2011b). This implies that greenhouse vegetable production is currently among the most viable agricultural activities.

Table 20 Area under glass, plastic or other protection in Edmonton.

	2006	2011	Change
Total number of farms reporting	17	11	-35%
Total area under glass, plastic or other protection - Sq. m.	44,545	41,979	-6%

Source Census of Agriculture 2006, 2011.

3.1.7. Trends in Livestock Production

Between 2006 and 2011, the number of farms reporting cattle ranching and farming decreased significantly from 26 to 3. Information on livestock farm area in Edmonton is not available through Census data. This farm type was the predominant form of livestock production in 2006. Livestock production also decreased significantly at the provincial scale, with an overall decline of 40% as shown in Table 21.

Table 21 Number of Livestock Farms in Edmonton.

	City of Edmonton			Province of Alberta
	2006	2011	Change	Change
Cattle ranching and farming	26	3	-88%	-41%
Hog and pig farming	0	0	0%	-68%
Poultry and egg production	2	2	0%	-19%
Sheep and goat farming	2	0	-100%	-12%
Total	30	5	-83%	-40%
<i>Based on NAICS classification</i>				

Source: Census of Agriculture 2006,2011.

The decrease in the number of farms producing livestock has not been matched by increases in the intensity of livestock farming or an increase in average farm size. The total number of cattle and calves decreased from 3,786 to 185 in Edmonton between 2006 and 2011, a decrease of 95% (Statistics Canada, 2006; Statistics Canada, 2011a). At the Provincial scale, total cattle inventories decreased by 20% (Statistics Canada, 2011b). Contributing factors likely included rising commodity prices (high feed costs), a high Canadian dollar, and increased market volatility (CanFax, 2011).

3.2 Farmland

3.2.1. Agricultural and Non-Agricultural Uses

This Inventory assesses land use in the Urban Growth Areas (UGAs) using data from Edmonton Assessment and from air photo interpretations. Edmonton Assessment classifies land based on several criteria, including use of the land, assessed value, and physical location. Air photo interpretations involve a review of aerial photographs to classify land use on each parcel. Together these methods can provide a picture of the spatial distribution of different land uses and agricultural practices on the UGAs. (Please refer to Appendix E for a comparison of air photo and assessment data).

Based on Assessment information, the primary land use for the Urban Growth Areas is agriculture at 92%, or 6,727 hectares (16,624 acres). This corresponds with the results of the air photo interpretations. Table 22 shows that approximately 6% of land zoned for agriculture in the UGAs is being used for non-agricultural purposes. This is partially balanced by the 2% of land that is zoned for non-agricultural purposes but is being used for agricultural purposes. Overall, 88% of the land area in the three UGAs is currently in agricultural use, and the remaining 12% of land is in other, non-agricultural land uses.

Table 22 Primary Land Use Classifications Using Edmonton Assessment Data

	Parcels (#)	Area (Hectares)	Area (Acres)	% of Total UGA Area
Agricultural Zoning - Assessed as Agricultural	349	6,320	15,618	86%

Agricultural Zoning - Assessed as Non-Agricultural	74	407	1,006	6%
Non-Agricultural Zoning - Assessed as Agricultural	11	166	411	2%
Non-Agricultural Zoning - Assessed as Non-Agricultural	472	461	1,138	6%
All Zones – Total	906	7,354	18,173	100%

Source: Edmonton Assessment Information for 2011.

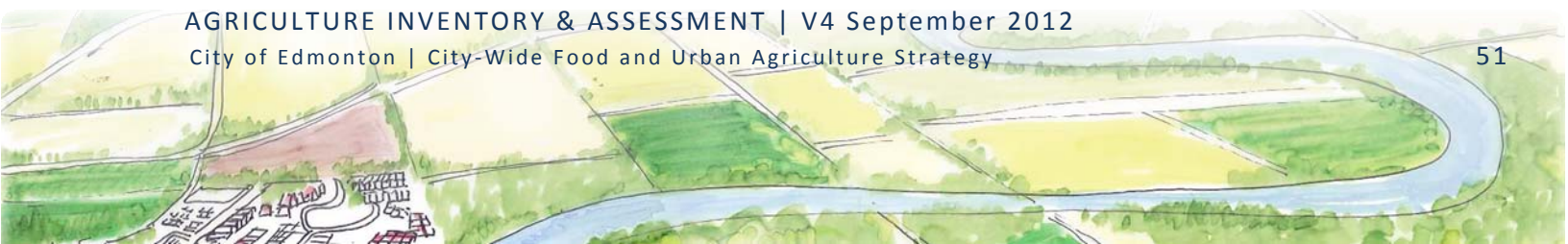


Table 23 show the results of the review of 2011 Edmonton Assessment data for all UGAs combined and each UGA. The Southwest has the highest share of land assessed as non-agricultural at 19% and the Southeast has the highest share of land assessed as agricultural at 95%. Appendix F includes more information on the types of non-agricultural uses present within the UGAs. The most significant non-agricultural use in the UGAs is recreation. Around 3% of the land in the UGAs is zoned for agricultural but assessed as Rural Residential land.

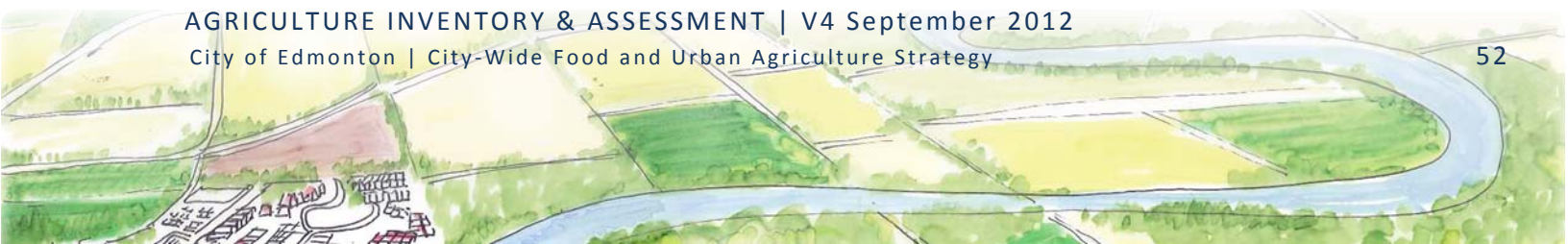
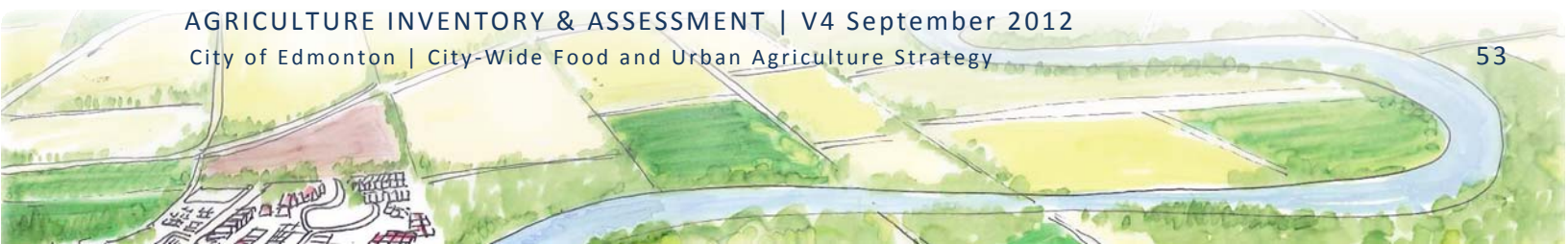


Table 23 Land Use Classifications by UGAs Using Edmonton Assessment Data.

		Parcels (#)	Area (Hectares)	Area (Acres)	% of Total Area
Southeast UGA	Agricultural Zoning - Assessed as Agricultural	105	1,871	4,624	95%
	Agricultural Zoning - Assessed as Effectively Non-Agricultural	17	50	122	3%
	Non-Agricultural Zoning - Assessed as Agricultural	-	-	-	0%
	Non-Agricultural Zoning - Assessed as Non-Agricultural	23	40	100	2%
	Total	145	1,961	4,846	100%
Southwest UGA	Agricultural Zoning - Assessed as Agricultural	66	1,445	3,571	80%
	Agricultural Zoning - Assessed as Effectively Non-Agricultural	16	201	496	11%
	Non-Agricultural Zoning - Assessed as Agricultural	3	15	38	1%
	Non-Agricultural Zoning - Assessed as Non-Agricultural	188	141	350	8%
	Total	273	1,803	4,454	100%
Northeast UGA	Agricultural Zoning - Assessed as Agricultural	178	3,004	7,424	84%
	Agricultural Zoning - Assessed as Effectively Non-Agricultural	41	157	388	4%
	Non-Agricultural Zoning - Assessed as Agricultural	8	151	373	4%
	Non-Agricultural Zoning - Assessed as Non-Agricultural	261	279	689	8%
	Total	488	3,591	8,873	100%

Source: Edmonton Assessment Information for 2011.



3.2.2. Current Parcel Size

Parcel size can influence the suitability of different crop types and agricultural activities. The current average parcel size for agricultural land in the UGAs is 17.4 hectares (43 acres). This average size is considerably larger than non-agricultural uses, which average at less than 2.3 hectares (6 acres).

3.2.3. Agricultural Activities by UGA

Specific agricultural activities (crop types) by location are not available through Census or Assessment information. In order to gather this data, this report uses air photo interpretations. During the air photo interpretation process, a primary land use was assigned to each parcel. In the cases where a parcel had mixed uses, the one that made up the majority of the property’s area was assigned as its primary use. As a result of this approach, it is possible that some agricultural activity types are overlooked.

The leading agricultural activity in the UGAs as a whole is grain and oilseed production (4,987 hectares of land), followed by greenhouses or nurseries (322 hectares of land), and field vegetables or flowers (284 hectares of land).

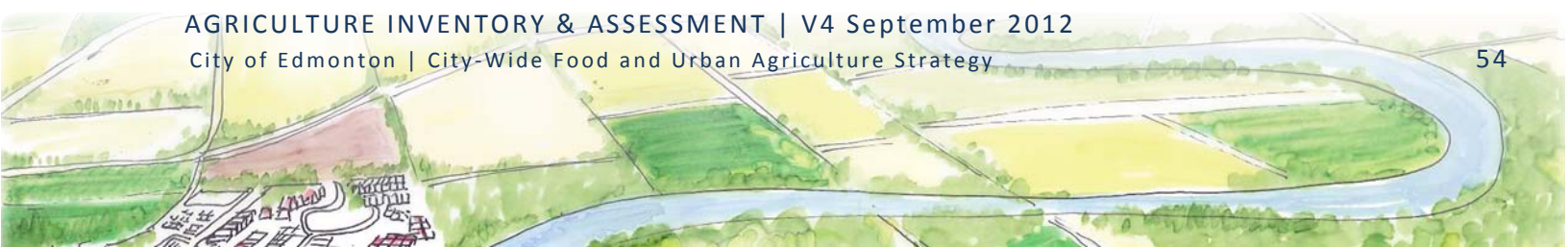
The agricultural activities differ by UGA. By area, the greatest share of primary agricultural activity in the UGAs is grains and oilseeds (85% Southeast, 81% Southwest, 52% Northeast). The Northeast has the greatest area not in agricultural use (27.8%) and the largest portion of greenhouses and field vegetables both at 7.9% (See Table 24).

Table 24 Primary Agricultural Use as Share of Agricultural Area in Each UGA.

Agricultural Activities	Southeast	Southwest	Northeast
Grains and Oilseeds	85.0%	81.0%	52.20%
Non-Agricultural Use	8.8%	16.2%	27.8%
Field vegetables or flowers	0.0%	0.0%	7.90%
Greenhouse or Nursery	0.3%	1.9%	7.90%
Livestock	0.0%	0.8%	1.75%
Forage Crops	5.2%	0.0%	2.30%
Miscellaneous agriculture	0.7%	0.0%	0.60%
Total Parcel Area*	1,960	1,802	3,591
<i>*This total only includes surveyed cadastral land parcels</i>			

Source: Air Photo Interpretation 2012.

In addition to mapping land uses by type, this Inventory uses a Simpson’s Diversity Index to calculate the diversity of agricultural uses. The index yields values between 0 and 1, with 0 being the least mixed and 1 being the most mixed. In terms of diversity of agricultural uses, the Northeast area has the highest



diversity of uses at 0.49 and the Southwest had the lowest diversity of uses at 0.11. Results are displayed in Table 25.

Measuring the diversity of all land uses makes it possible to estimate the relative fragmentation of agricultural land use with other uses by comparing the proportion of agricultural land use to that of the diversity of all land uses. Based on this approach, the Northeast (with lowest percentage of lands zoned as agriculture as a percentage of total area) also has the highest diversity of land uses (non- agricultural uses) at 0.37 and the highest level of fragmentation. These results are presented in Table 25

Table 25 Agricultural Diversity and Fragmentation in the UGAs.

Urban Growth Area	Diversity of Agricultural Uses Index	Agricultural Fragmentation Index	Percentage of UGA Parcel area in Agriculture Use
Southwest	0.11	0.22	87%
Southeast	0.34	0.16	94%
Northeast	0.49	0.37	78%

Source: Air Photo Interpretation 2012.

Table 26 shows the 2011 assessed land value. There is considerable variation in land valuation between the three Urban Growth Areas. The assessed value of land zoned as Agricultural (AG) ranges from \$7,000 per acre in the Southwest to \$14,000 per acre in the Southeast. For comparison, several vacant Rural Residential (RR) Zone lands were valued at an average of \$20,000 per acre in 2011. Figure 14 illustrates the range of land values per acre for all parcels in the Urban Growth Areas.

Table 26 2011 Assessment Authority Land Valuations for Rural Residential Zone Lands.

	Southwest UGA	Southeast UGA	Northeast UGA	Average
Average Dollars per Acre	\$7,000	\$14,000	\$12,000	\$11,000

Source: Edmonton Assessment Information for 2011.

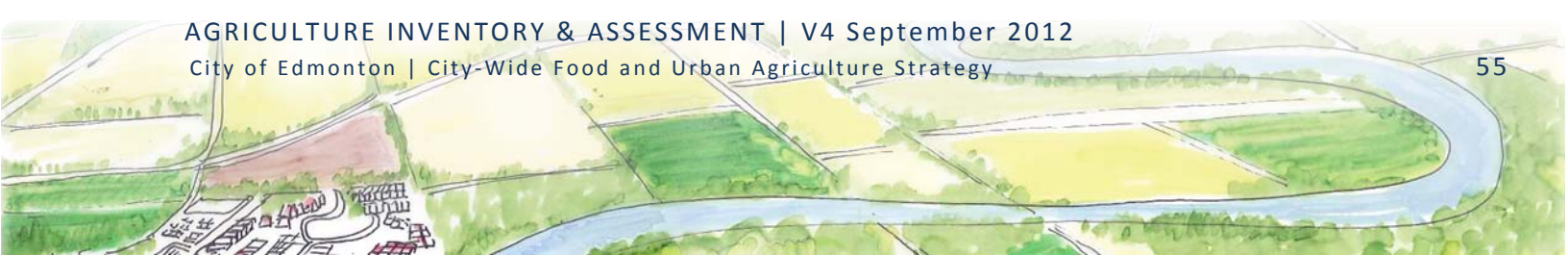
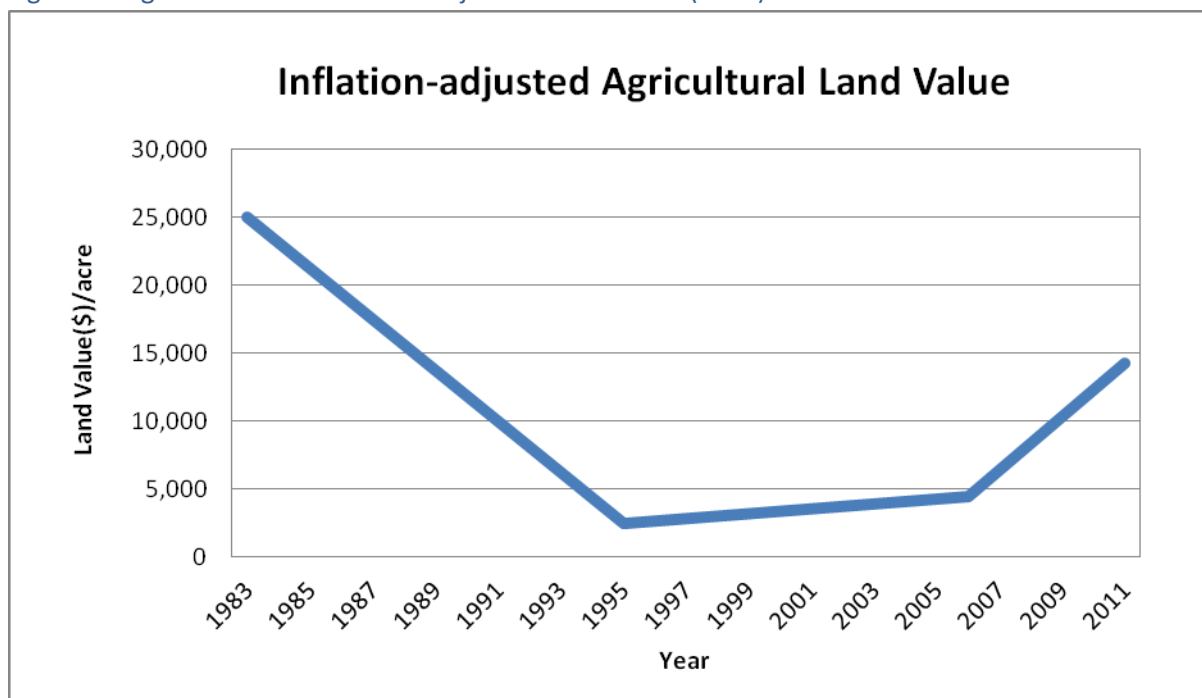


Figure 10 Agricultural Land Value – Adjusted for Inflation (2012).



Source: 1983 figure from Deloitte Haskins and Sells (1983). 1996, 2006 and 2011 figures sourced from Statistics Canada Census of Agriculture.

It was not possible to obtain individual land parcel valuations from previous Assessment years for comparison to 2011 values. However, a study completed in 1983 quotes an estimate of \$25,547 per acre (\$2012), equal to \$12,000 in 1983 dollars for fair market value of land in the primary agricultural land management areas, a value more than double today's value (Deloitte Haskins & Sells Associates, 1983). Market value of land is not necessarily equivalent to assessed value, as assessment is tied to property taxation levels. Market values for agricultural land are usually higher. A quick scan of agricultural MLS listings in Edmonton area range from \$25,000 - \$40,000 per acre for intact, unsubdivided quarter sections, land market values increase substantially as parcel size decreases. While it is not possible to correct for macro-economic trends using this single reference, the decline in value (from \$25,547 per acre to around \$11,000 per acre in 2012 in 29 years) is significant. The report suggests that land prices may have spiked shortly after annexation due to speculation (Leskiw, Esak, Can-Ag Enterprises Ltd., 1994).

3.2.4. Brief History of Annexation in Edmonton

Annexation of rural land in Edmonton began at the turn of the 20th century as the city established itself and grew with the arrival of the CPR. Growth slowed during the interwar period, and then resumed again beginning in the late 1950s/early 1960s when Edmonton again annexed a significant amount of

rural land from neighbouring municipalities, including the Town of Beverly, Jasper Place, and Mill Woods. The annexation of rural lands by the City of Edmonton to accommodate continued population growth has continued to increase since the 1950s (see Table 27 below and Appendix G).

Table 27 Historical land annexation to the City of Edmonton by size.

Annexation Era	Hectares	Acres
1890	1,289	3,185
1900	4,612	11,397
1910	4,665	11,527
1920	123	304
1940	79	194
1950	3,838	9,483
1960	8,070	19,942
1970	9,202	22,740
1980	37,268	92,091

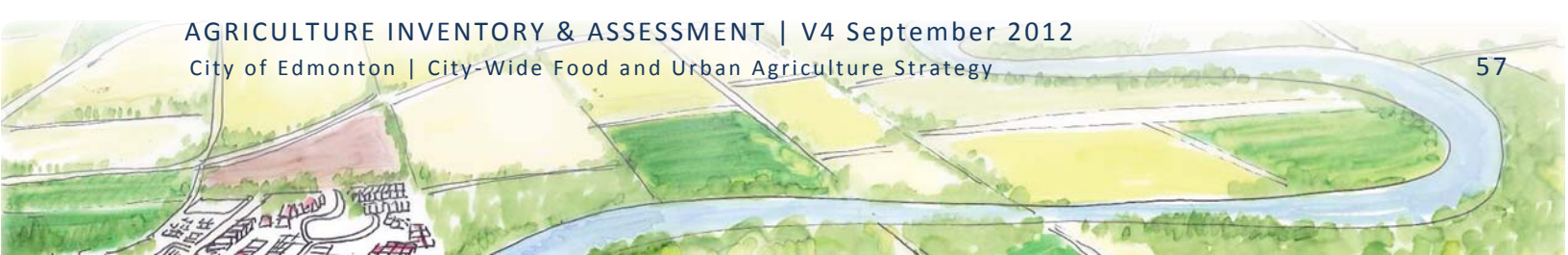
Source: City of Edmonton GIS data 2011.

To gain a better understanding of historic growth patterns as it relates to agricultural lands, land development and annexation, annexation information was analyzed along with the City of Edmonton Growth Map. By combining the information from this map with that of the annexation map, it becomes apparent both when development has occurred in each annexation zone and how much land remains available within each annexation zone. The results of this analysis are displayed in Table 28.

Table 28 Development of land acquired through annexation, by era.

Annexation Era	Development Period					Natural Areas	Utility Corridor	Vacant Land
	1902-1927	1927-1965	1965-1981	1981-2007	2007-2011			
1890	18%	63%	4%	0%	0%	15%	0%	0%
1900	0%	51%	30%	2%	0%	17%	0%	0%
1910	0%	15%	59%	17%	1%	8%	0%	0%
1920	0%	1%	39%	2%	0%	58%	0%	0%
1940	0%	0%	100%	0%	0%	0%	0%	0%
1950	0%	3%	29%	39%	9%	20%	0%	0%
1960	0%	6%	21%	51%	14%	9%	0%	0%
1970	0%	2%	2%	48%	26%	6%	10%	6%
1980	0%	3%	1%	2%	27%	10%	10%	47%

Source: City of Edmonton GIS data 2011.



Each row in Table 28 represents an annexation era. The percentages should be read left to right with each percentage representing the amount of area of annexation land by the approximate era of its development. Other lands remain as natural areas, utility corridors or vacant lands.

The general trend for complete build out of annexed land is between 30 - 60 years after annexation, but totally depends on market cycles. Of particular note to this assessment is the amount of remaining vacant land in the 1980 annexation era. City-wide, as of the end of 2011, 17,269 hectares (43,544 acres), or 47%, of the area of the 1980 annexation era remains as agricultural or undeveloped land. While it is beyond the scope of this Inventory to discuss the implications of the amount of developable/or available land within the current (1980) annexation area, it is useful to note that at least 37% of the 1980's annexation area has been built-up in the past 4 years (2007-2011), accounting for approximately 13,000 hectares (33,814 acres) of recently developed land.

3.2.5. Soil Class vs. Land Use

Overall, very little prime agricultural soil in the UGAs is currently used for non-agricultural land-uses. Table 29 examines the availability and current use, as analyzed using air photos, of prime agricultural land. The prime soils in the Northeast, while predominantly used for agriculture, also have the highest amount of non-agricultural uses across all UGAs at 12%. The Southwest has the largest amount of permanently vegetated land, including treed land, and most of it is located on non-prime agricultural soils. Figures 11, 12, 13 and 14 show land use designations, primary land used based on air photo interpretation, primary agricultural use, and assessed value respectively.

Table 29 Soil Class vs. Land Uses Based on CLI Classifications and Air Photo Interpretation.

Urban Growth Area	Soil Classification	Agricultural Use	Vacant and/or Unused agricultural land	Non-Agricultural Uses (Residential, Utility, and Other)
Northeast	Prime	78%	5%	17%
	Non-Prime	56%	12%	32%
Southwest	Prime	95%	0%	5%
	Non-Prime	74%	0%	26%
Southeast	Prime	87%	2%	6%
	Non-Prime	98%	0%	2%

Sources: Air photo interpretation 2012, Canada Land Inventory 2001.

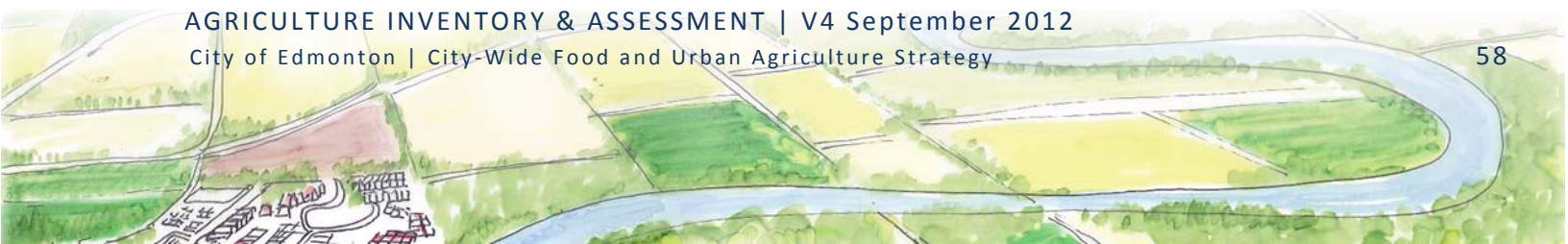
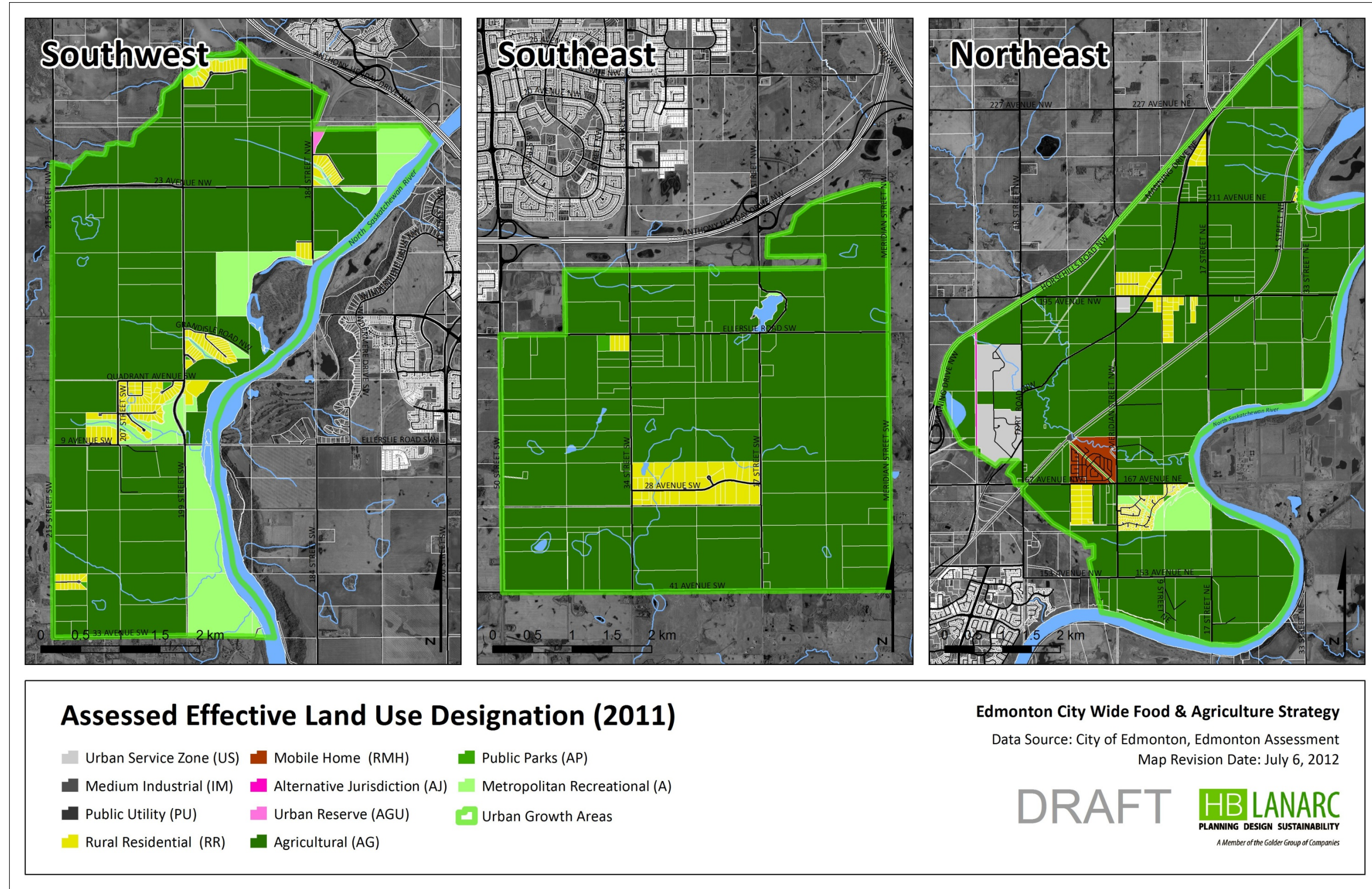
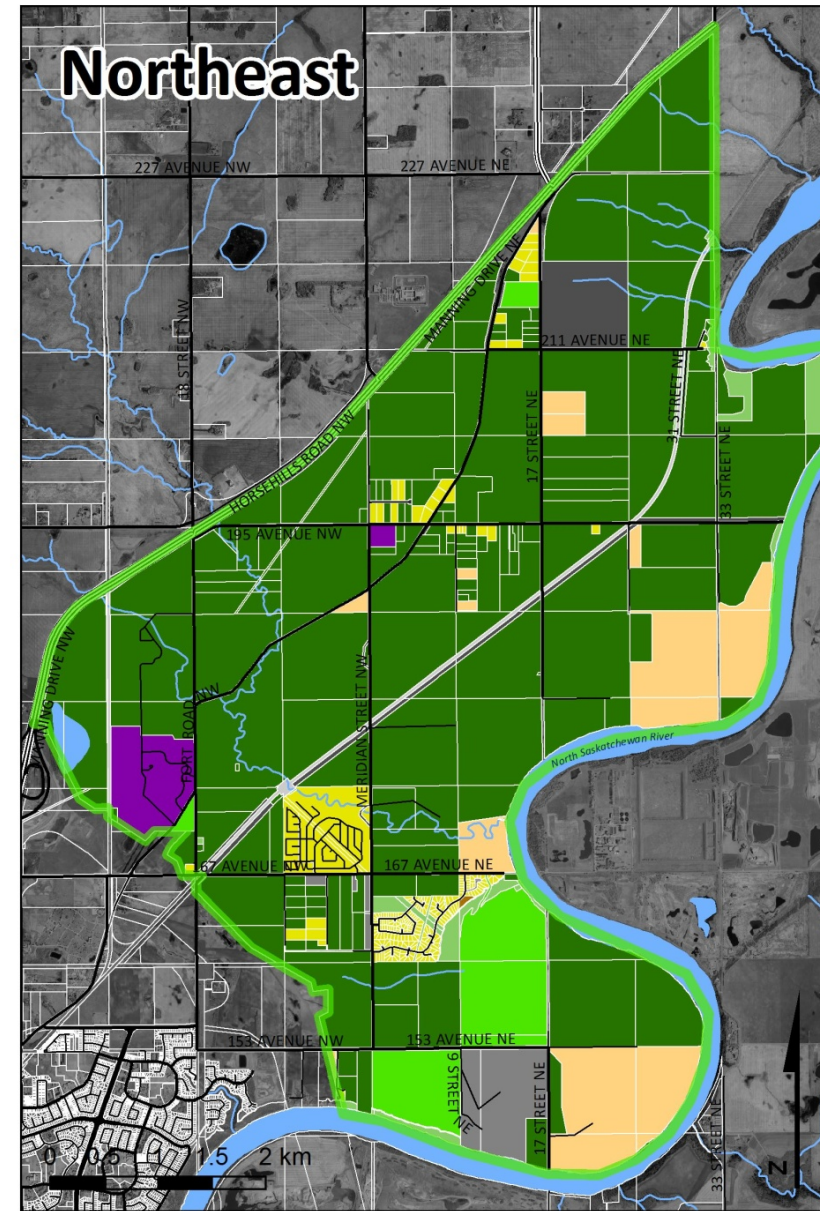
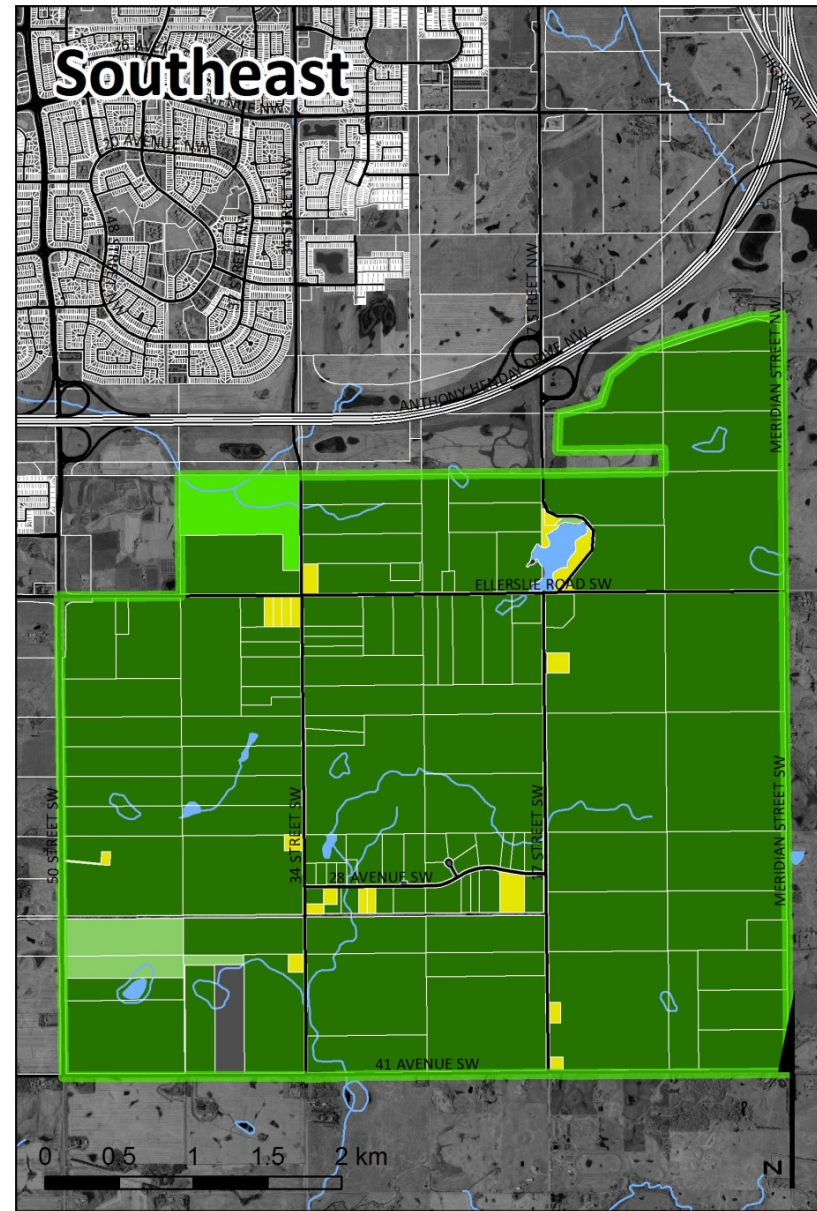
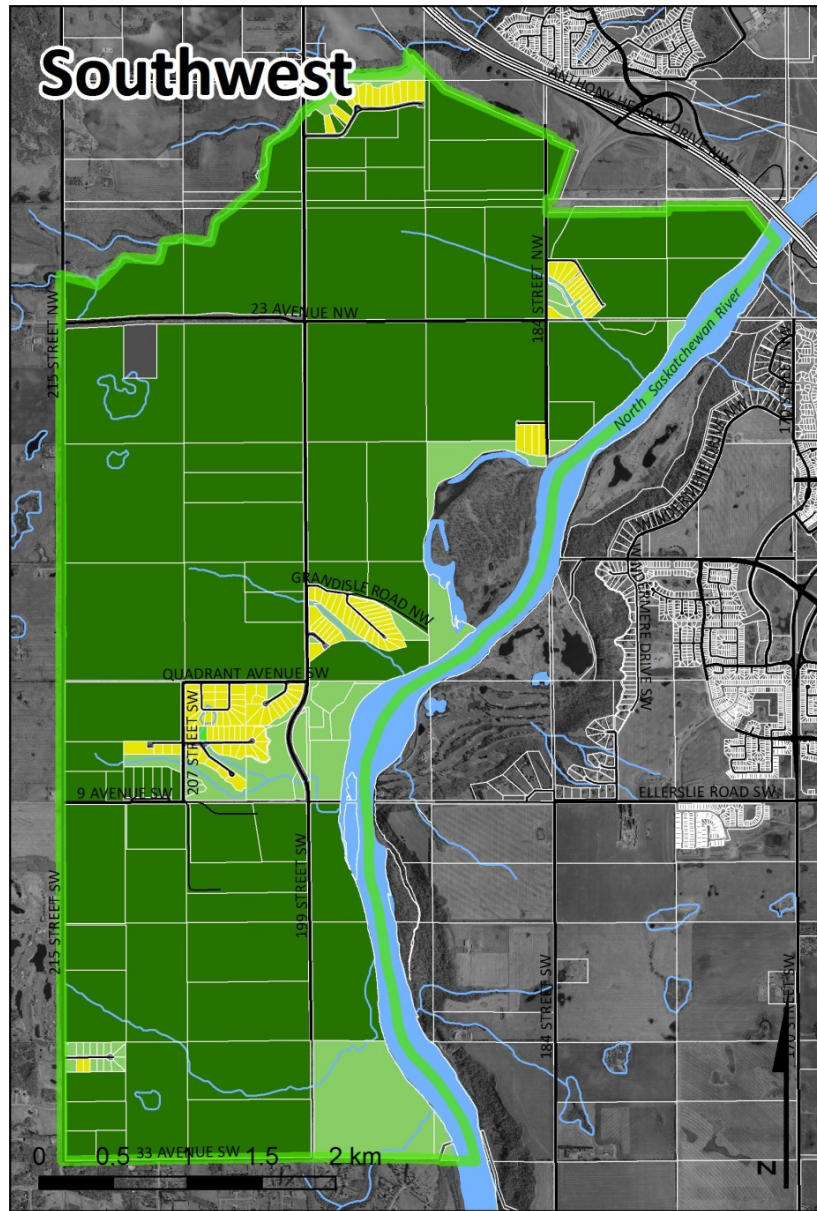


Figure 11 Assessed Land Use Designations in the UGAs.



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Figure 12 Primary Land Use Based on Air Photo Interpretation.



Primary Land Use

- Agriculture
- Recreation and Open Space
- Transportation
- Vegetated
- Industrial Use
- Residential
- Unused and Land in Transition
- Urban Growth Areas
- Institutional Use
- Telecommunications/Utilities
- Vacant and/or Unused Agricultural Land

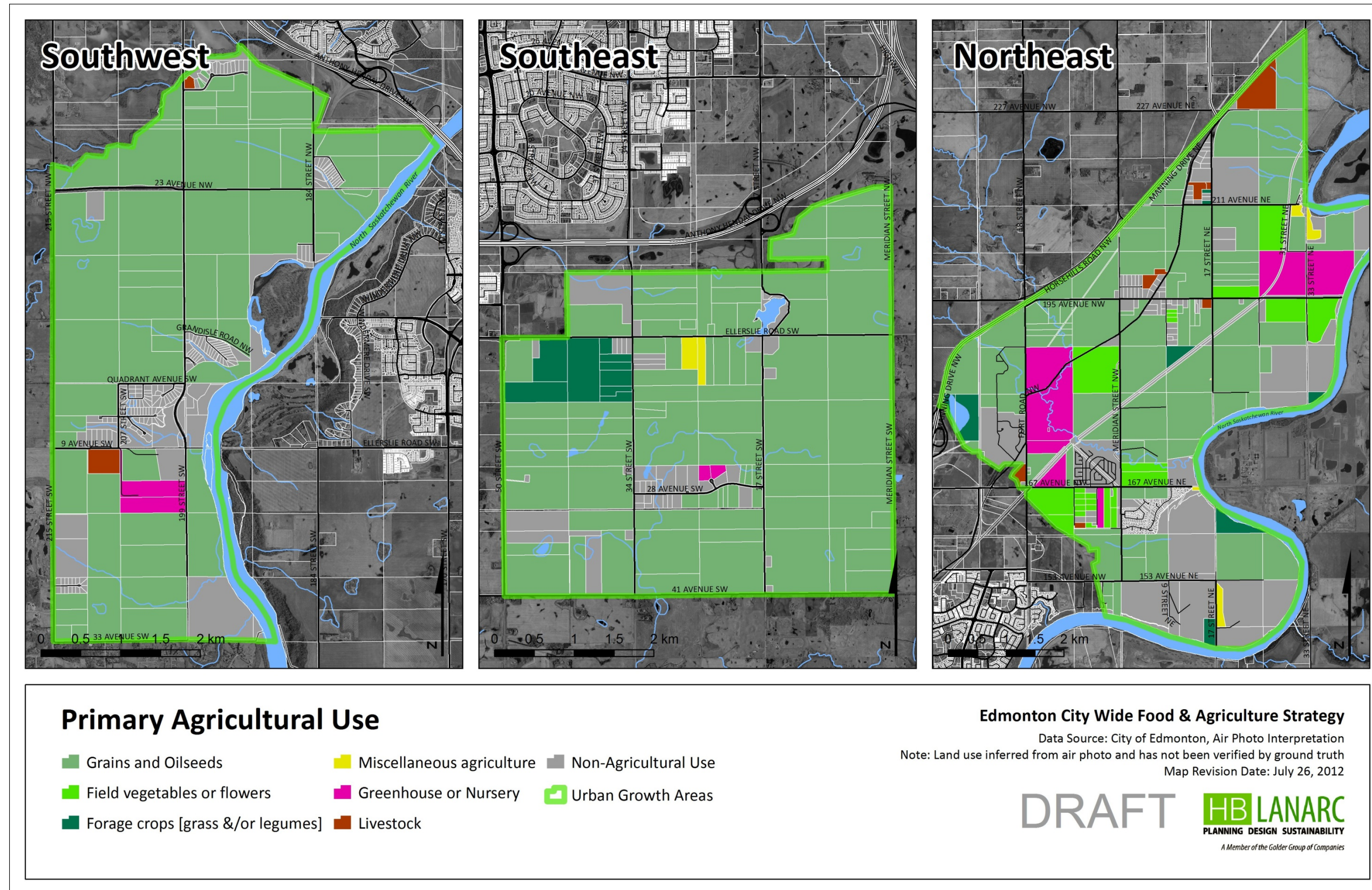
Edmonton City Wide Food & Agriculture Strategy

Data Source: City of Edmonton, Air Photo Interpretation
 Note: Land use inferred from air photo and has not been verified by ground truth
 Map Revision Date: July 6, 2012

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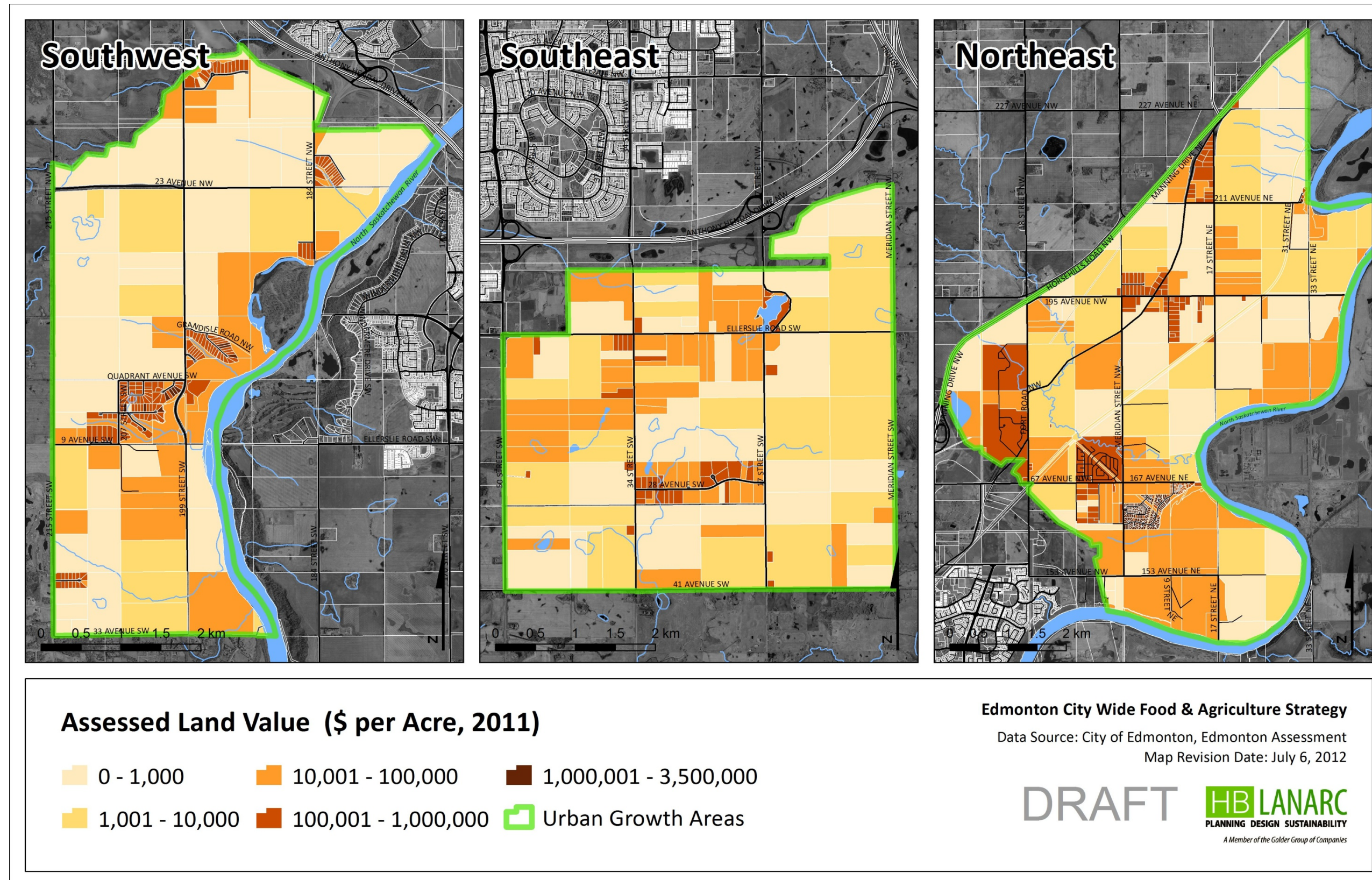
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Figure 13 Primary Agriculture Use Based On Air Photo Interpretation.



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Figure 14 Assessed Land Value Based on City Assessment Data.



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4. Closing

This inventory has used multiple data sources and methods to provide a summary of the current conditions for agriculture in Edmonton, specifically the Urban Growth Areas. The findings support what the study team has heard anecdotally from many stakeholders (e.g. that the agricultural capability of lands within the UGAs is high, with a large majority (71%) of lands in the area having soils classified as prime agricultural (Class 1 to 3), significant water availability, and growing-season temperatures supportive of a wide variety of crop types). The three UGAs differ somewhat in their agricultural capabilities with the Northeast having the largest share of prime agricultural soil and a slightly better micro-climate as measured by higher average growing-season temperatures.

The study found that the number of farms, amount of farmland and agricultural activity in Edmonton have decreased over recent years, as shown by both Census data and information from the Assessment Authority. To a certain extent this decrease is expected within the boundaries of a major urban centre like Edmonton. Construction of new highways and development of new neighbourhoods is normal for regions that are experiencing high rates of growth. These drivers, combined with others such as a boom in farm input costs (such as grain feed, fertilizer, and the cost of labour, an aging farm-operator population), create the conditions and trends that have been presented in this Inventory. While these general trends provide challenges for the future of farming in Edmonton, some farm activities (such as greenhouses) appear more resilient to these pressures than others.

The information presented in this report raises a number of questions that should be addressed by the Citywide Food and Urban Agriculture Strategy. These include:

- Should land be protected for agriculture in the City? If so, for what purpose should the lands be protected?
- If land is protected, how much land and in what pattern?
- What are the mechanisms that can be used to effectively and fairly protect agricultural land?
- What is the economic potential for expanding the amount of food that is produced, processed and prepared in Edmonton?
- What is the potential for pursuing opportunities such as agri-tourism strategies and what is the feasibility for agri-support services?

This report has presented the bare facts to provide a basis for further discussion on how to undertake long-range planning for food and agriculture. The changes in farming and farmland since 2006 underline the need for the Citywide Food and Urban Agriculture Strategy to raise and possibly address the question of what the future holds for farming in the City of Edmonton over the next 10, 20, or even 100 years.



5. Appendices



5.1 Appendix A: Canada Land Inventory Soil Capability Classes for Agriculture

Table 30 Canada Land Inventory Soil Capability Classes for Agriculture.

Class	Description
1	Soils in this class have no significant limitations for use as agricultural land.
2	Soils in this class have moderate limitations that restrict the range of crops or require moderate conservation practices.
3	Soils in this class have moderately severe limitations that restrict the range of crops or require special conservation practices.
4	Soils in this class have severe limitations that restrict the range of crops or require special conservation practices.
5	Soils in this class have very severe limitations that restrict their capability to only producing perennial forage crops. Improvement practices are feasible.
6	Soils in this class are capable of producing only native forages. Improvement practices are not feasible.
7	Soils in this class have no capacity for arable agriculture or permanent pasture.
O	Organic soils not placed in capability classes.

Source: Canada Land Inventory, 2001.

CLI has also assigned a subclass to each map unit, other than Class 1, to describe the kind of limitations for agriculture (Table 31).

Table 31 Canada Land Inventory Soil Capability Subclasses for Agriculture.

Subclass	Description
C	Adverse climate
D	Undesirable soil structure and/or low permeability
E	Erosion
F	Low fertility
I	Inundation by streams or lakes
M	Moisture limitations
N	Salinity
P	Stoniness
R	Consolidated bedrock
S*	Combination of subclasses
T*	Topography



W	Excess water
X*	Cumulative effect of two or more adverse characteristics
*	<i>Subclasses mapped in the Urban Growth Areas</i>

Source: Environment Canada 1972.

5.2 Appendix B: Soil Capability by Urban Growth Area

The Canada Land Inventory (CLI) maps soil capability for agriculture across Canada.

Table 32 describes the soil capability for agriculture of each of Edmonton’s UGAs based on the CLI.

Table 30 and Table 31 describe the criteria used by CLI to classify soil capability by class and subclass.

Table 32 Soil Capability by Urban Growth Area Based on CLI Classifications.

Urban Growth Area (UGA)	Soil Capability Class	Soil Capability Subclasses	Area (Ha.)	Area (% of UGA)
Southeast Edmonton	1	none	232	11.43%
	2	T	537	26.49%
	3	T	401	19.76%
	4	T, S	848	41.84%
	6	T	10	0.5
	Total		2,028	
	Prime Soils		1,169	57.64%
Northeast Edmonton	1	none	1850	48.27%
	2	S, X	1049	27.38%
	3	S	157	4.09%
	4	S	83	2.20%
	6	T	657	16.80%
	not mapped	-	51	1.30%
	Total		3,832	
Prime Soils		3,056	79.75%	
Southwest Edmonton	1	none	1,105	54.50%
	3	S	179.5	8.85%
	4	S, T	83.1	4.10%
	5	T, S	28.9	1.43%
	6	T	551.9	27.21%
	O	Organic	21	1.04%
	not mapped		8	2.92%



	Total	2,028	
	Prime Soils	1,285	63.33%



5.3 Appendix C: Climate Trends

Table 33 summarizes the key climatic trends in Edmonton and, where available, the associated range of values for Alberta. These data are drawn from Climate Normals recorded by Environment Canada.

Table 33 Climatic Trends in the City of Edmonton and Alberta.

Measured Climatic Element	City of Edmonton	Alberta
Corn heat units (1971-2000)	2,000 to 2,200	<1,600 to >2,400
Date of first fall frost (1971-2000)	September 11 to 20	August 21 to September 20
Frost free period (1971-2000)	>125 days	<85 to >125 days
Length of growing season $\geq 5^{\circ}\text{C}$ (1971-2000)	180 to 185	<160 to >185
Start of growing season $\geq 5^{\circ}\text{C}$ (1971-2000)	April 17 to 23	April 17 to May 7
Days with precipitation $>0.22\text{ mm}$ (1971-2000)	105 to 120	
Days with precipitation $>25\text{ mm}$ (1971-2000)	1 or 2	
Total precipitation (1971-2000)	450 to 500 mm	<350 to >600 mm
Greatest daily precipitation (1901-2000)	80 to 100 mm	
Mean annual maximum daily precipitation	40 to 45 mm	
Sep 1 to Apr 30 precipitation	175 to 200 mm	<150 to >175 mm
Estimated May 1 to Aug 31 precipitation	250 to 290 mm	<200 to > 325 mm
January daily mean temperature (1971-2000)	-14 to -12 $^{\circ}\text{C}$	
July daily mean temperature (1971-2000)	$\sim 16^{\circ}\text{C}$	



5.4 Appendix D: Detail- Farm Counts and Production Trends

The tables below are provided to supplement those in the document. They are calculated from 2006 and 2011 Census of Agriculture Information (Statistics Canada, 2006; Statistics Canada, 2011a).

Table 34 Top Ten Products by Farm Count.

Top Ten Products By Farm Count in Edmonton			
	2006	2011	Change
Alfalfa and alfalfa mixtures	46	15	-67%
Wheat (Includes Spring and Durum)	34	9	-74%
Canola	37	8	-78%
All other tame hay and fodder crops	20	8	-60%
Barley	29	6	-79%
Sweet corn	5	4	-20%
Cucumbers	6	4	-33%
Green and Wax Beans	7	4	-43%
Carrots	6	4	-33%
Beets	5	4	-20%
All	195	66	-66%

The largest share of total farm area in Edmonton in 2011 was crop land (77%) followed by pasture land (11%) and treed land (6%).

Table 35 Farm Count by Farm Area.

Area (Acres)	Edmonton		
	Edmonton 2006	Edmonton 2011	Change
<10	18	23	+28%
10-69	41	19	-54%
70 - 129	19	14	-26%
130 - 179	16	3	-81%
180 - 239	10	1	-90%
240 - 399	19	6	-68%
400 - 559	15	2	-87%
560 - 759	9	1	-89%
760 - 1,119	10	1	-90%
1,120 - 1,599	4	0	-100%
1,600 - 2,239	3	2	-33%



2,240 - 2,879	5	1	-80%
2,880 - 3,519	0	0	0%
> 3,520	1	0	-100%
Total number of farms	170	73	-57%

Table 36 Trends in Vegetable Production in Edmonton.

	2006	2011	Change
Total Number of farms reporting	9	8	-11%
Area in Acres	362	210	-42%
Area in Hectares	146	85	-42%

Table 37 Trends in Canola Production in Edmonton.

	2006	2011	Change
Total Number of farms reporting	37	8	-78%
Area in Acres	12,897	3,487	-73%
Area in Hectares	5,219	1,411	-73%

Table 38 Trends in Alfalfa Production in Edmonton.

	2006	2011	Change
Total Number of farms reporting	46	15	-67%
Area in Acres	5,355	1,163	-78%
Area in Hectares	2,167	471	-78%

Table 39 Trends in Nursery Production.

	2006	2011	Change
Total Number of farms reporting	13	12	-8%
Area in Acres	239	174	-28%
Area in Hectares	97	70	-28%



5.5 Appendix E: Validating Results- Comparison of Air Photo and Assessment Data Results

There was a high correlation between the results of the air photo interpretation and the analysis of Edmonton Assessment data. In all three UGAs the predominant land use is agriculture. The proportion of land base devoted to agriculture ranges by UGA from 84% in the Southwest to 95% in the Southeast depending on the method used.

Table 40 Comparison of Air Photo and Assessment Data Results on Land Use in the UGAs.

UGA Name	Agriculture as Share of Total Land Base based on Air Photo Interpretations*	Agriculture as Share of Total Land Base from Assessment Data for Effective Zone*
Southwest	81%	87%
Southeast	95%	94%
Northeast	88%	73%

**This total only includes surveyed cadastral land parcels.*



5.6 Appendix F: Detail - Shares of Effective Zones for Each Urban Growth Area

Two main data sources were used in this Report to examine current land uses on the UGAs: Edmonton Assessment and air photo interpretation.

Table 41 shows the shares of land zones as Agricultural (Actual Zone) described based on its Effective Zone for each of the Urban Growth Areas. Notable cells are highlighted in bold. A small amount of agriculturally zoned land is used for residential purposes (3.7%). A small portion is also recreational (4.4%). Overall, 88% of UGA land zoned as agricultural (Actual Zone) is used for agricultural purposes.

Actual Zoning	Actual use
What land-uses “should” be present on a given parcel, based on zoning bylaw and City records	What is currently present based on a site-visit from a municipal Assessor. This may be different from Actual Zone and is referred to here as Effective Land Use.

Table 41 Shares of Effective Zones for Each of the Urban Growth Areas.

Effective Land Use	Southwest		Southeast		Northeast		All UGAs	
	Hectares	%	Hectares	%	Hectares	%	Hectares	%
Agricultural Zone (AG)	1,460.5	81.0	1,871.1	95.4	3,155.2	87.9	6,663.2	88.2
Alternative Jurisdiction Zone (AJ)	0.0	0.0	0.0	0.0	6.5	0.2	6.5	0.1
Medium Industrial Zone (IM)	0.0	0.0	0.0	0.0	25.0	0.7	25.1	0.3
Metropolitan Recreation Zone (A)	243.6	13.5	0.6	0.0	70.0	1.9	327.7	4.3
Mobile Home Zone (RMH)	0.0	0.0	0.0	0.0	60.1	1.7	60.1	0.8
Public Parks Zone (AP)	1.7	0.1	3.5	0.2	6.7	0.2	12.2	0.2
Public Utility Zone (PU)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rural Residential Zone (RR)	94.1	5.2	85.7	4.4	130.1	3.6	319.4	4.2

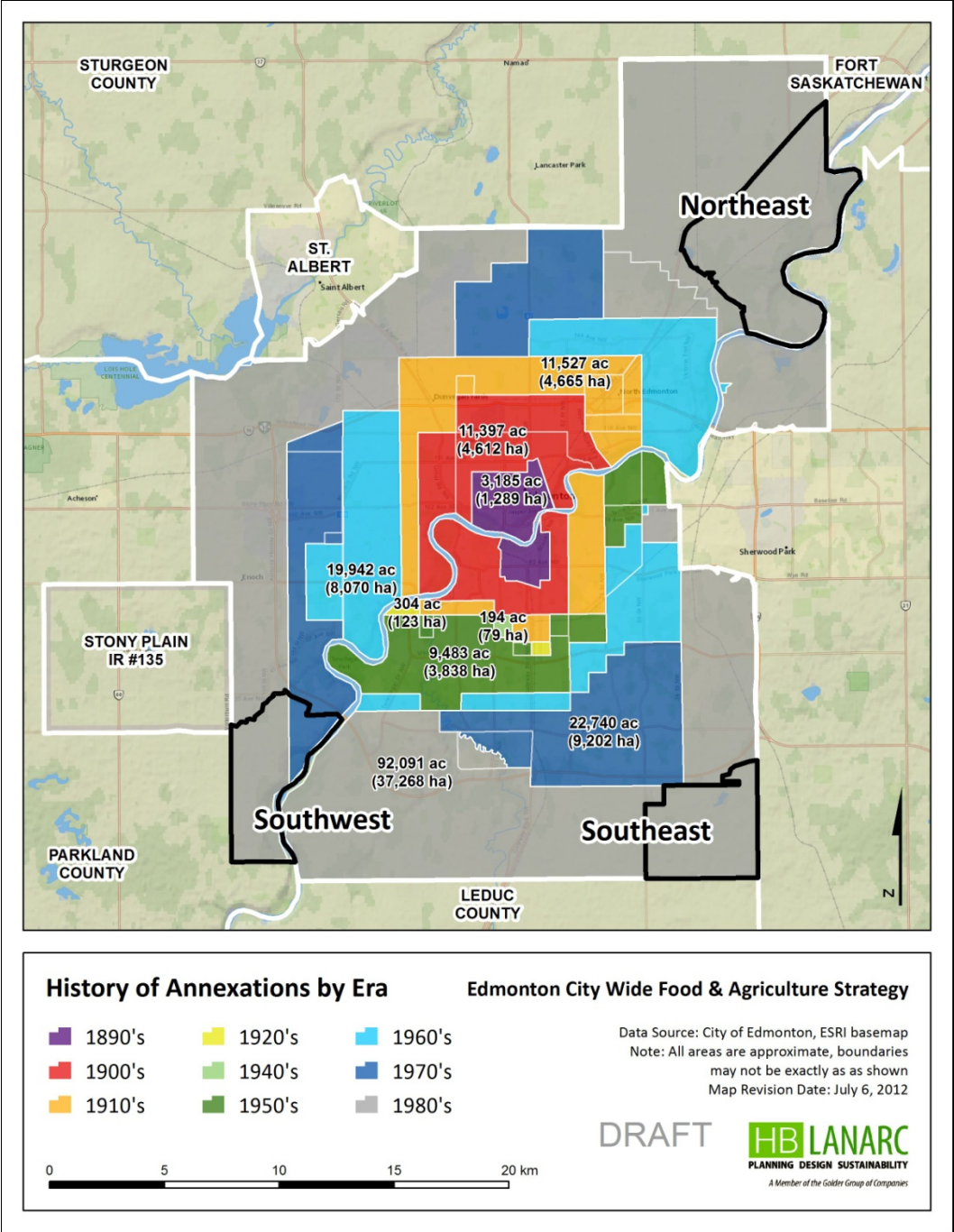


Urban Reserve Zone (AGU)	2.7	0.1	0.0	0.0	0.0	0.0	2.8	0.0
Urban Service Zone (US)	0.0	0.0	0.0	0.0	137.4	3.8	137.4	1.8
Grand Total*	1,802.5	100	1,961.0	100	3,591.0	100	7,554.5	100
<i>*This total only includes surveyed cadastral land parcels.</i>								

5.7 Appendix G: Map Showing the History of Annexations in the City of Edmonton

Figure 15 History of Annexation by Era.







5.8 Appendix H: Soils in the Alberta Capital Region

Table 42 CLI Soil Classes in Alberta Capital Region.

Class	Edmonton	Lamont County	Leduc County	Parkland County	Strathcona County	Sturgeon County	Grand Total	Total Excluding Edmonton
1	25,707	38,404	61,221	17,515	25,298	72,969	241,114	215,407
2	14,978	101,813	51,880	26,264	21,756	40,199	256,891	241,913
3	5,890	47,812	82,629	67,251	24,450	53,593	281,625	275,735
4	2,404	15,574	39,455	59,306	25,601	24,407	166,747	164,344
5	159	10,534	11,858	33,068	15,278	14,869	85,765	85,606
6	5,744	33,934	18,035	17,320	11,131	17,435	103,599	97,855
7	-	184	573	5,327	994	306	7,385	7,385
8	13,898	-	4,398	4,880	102	1,357	24,636	10,738
O	1,138	5,752	7,416	43,531	2,204	10,064	70,105	68,968
Prime Soils Class 1,2,3	46,576	188,029	195,730	111,030	71,504	166,761	779,631	733,055
Class 4-7+O	9,444	65,980	77,338	158,552	55,208	67,081	433,603	424,158
Class 8 (Built up)	13,898	-	4,398	4,880	102	1,357	24,636	10,738
Total	69,918	254,009	277,466	274,462	126,814	235,199	1,237,869	1,167,951
% Class 1,2,3 soils	66.6%	74.0%	70.5%	40.5%	56.4%	70.9%	63.0%	62.8%
% Class 4-7 + O	13.5%	26.0%	27.9%	57.8%	43.5%	28.5%	35.0%	36.3%
% Class 8	19.9%	0.0%	1.6%	1.8%	0.1%	0.6%	2.0%	0.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
% Class 1	37.0%	15.0%	22.0%	6.0%	20.0%	31.0%	19.0%	18.0%

Source: Canada Land Inventory, 2001. Units are Hectares.



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