Changes in Land Use in Edmonton, AB between 1966-1976

Produced for the Edmonton City Council

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Executive Summary

Urban centre growth accounted for the most rapid land use change in Edmonton, AB between 1966-1976 by nearly tripling in total area and number of patches. Rapid urban growth did not have a detrimental effect on cropland as only 3.3% of cropland was converted to urban built-up space. Mines, quarries, sand and gravel pits expanded in area during this period while outdoor recreation spaces decreased by half. The total area increased while the number of land use patches decreased suggesting that land use became less diverse over time and that existing patches expanded in area rather than in distinct patches across the landscape.

Introduction

Land use among growing populations is an important topic and is important to many decisions city planners and councils must make to best support residents and plan for the future. In Edmonton, AB, land use changes over time between 1966-1976 show the impacts of growing populations on the landscape. This report will discuss how select land use categories changed in this ten-year period and by what metrics this change is explained. Understanding how land use changes over time will help the Edmonton City Council to plan future developments and address issues promptly and efficiently.

Methods

This report used the Canada Land Use Monitoring (CLUMP)[1] data from the Geogratis web archive for the area of, and surrounding, Edmonton in 1966 and 1976. To determine the number of patches (land use parcels), both of the maps were analyzed using Fragstats based on sixteen landscape metrics although for this report, only eight of these metrics[2] are used for analysis (Table 1, Table 2).

Results and Discussion

Between 1966-1976, there was an overall decrease in the total number of patches (Table 2) although there was an increase in total land area by 12,455 hectares.[3] The decrease in number of patches but increase in total land area indicates that

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[1] See Table 4 for CLUMP definitions

[2] See Table 3 for an explanation of the metrics used.

[3] Total obtained by summing Total Area columns in Table 1.

smaller, disconnected land use patches in 1966 had consolidated into fewer but larger patches and that land use was becoming less diverse.

Several trends are visible in the changes in land use between 1966-1976. The number of urban built-up land patches increased as did the total edge length (Figure 2, Figure 3). The total land area of urban built-up spaces nearly tripled during this time (Table 1). This increase reflects Hansen's (1984) assessment of faster growth of smaller urban places during this period. It is also important to note that the definition of urban built-up areas used by this report is not the same definition used by Statistics Canada as it relies on areas being "functionally urban" rather than being determined by administrative boundaries (Hansen, 1984). This "functionally urban" area includes all activities that make up an urban centre such as residential, commercial, and industrial spaces as well as urban parks (Hansen, 1984).

In opposition to the growth of urban built-up area, the area of cropland patches decreased. Between 1966-1976, the percentage of the landscape taken up by cropland decreased by 3.3% (21,559 ha) (Table 1). This decrease in cropland can be partially attributed to 3.3% of cropland becoming urban built-up space (Table 5). While overall cropland area decreased, the number of patches increased which indicates that small agricultural operations grew in number (Table 1). Mines, quarries, sand and gravel pits also experienced a similar growth and decrease. The total area of mines, quarries, sand and gravel pits nearly doubled from 1681 hectares to 3116 hectares while the number of patches decreased (Table 1). This indicates that existing mines, quarries, and sand/gravel pits expanded in area while a small number shut down and converted to other land use or were amalgamated with adjacent patches.

Outdoor recreation area decreased by half while the number of patches decreased from 16 to 6 (Table 1). This is likely the result of the growth of urban built-up areas as outdoor recreation spaces located within the urban built-up space would have been reclassified as urban built-up space based on Hansen's (1984) "functional urban" definition. When looking to the transition matrix showing changes in land use for this time period, only 0.04% of outdoor recreation space became urban built-up space so the growth of urban built-up space alone does not explain the drastic decrease (Table 5).

Transition matrices are useful to understand how land use changes over time especially in regions where rapid changes have occurred over a set time period. The transition matrix in this report (Table 5) shows only a small amount of land conversion from cropland to other uses. Between 1966-1976, 7.79% of cropland was converted to other uses with the largest conversions being to unimproved pasture and range land (2.94%) and to urban built-up area (3.32%) (Table 5). The greatest land conversion was from unimproved pasture and range land to productive woodland (3.81%) (Table 5). Overall, in the period of 1966-1976, land conversion from one land use to another was not significant. The majority of land in, and surrounding, Edmonton remained cropland.

References

Hansen, J. (1984). Canadian small settlements and the uptake of agricultural land, 1966–1976. *Social Indicators Research, 15*(1), 61-84.