

A Balancing Act - the Policy Approach to Fragmentation and Conversion of Agricultural Land

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Context

- With the release of the Land-use Framework (LUF) in December, 2008, fragmentation and conversion of Alberta's agricultural land was identified as an area in need of policy analysis and development.
- Public concern around **food security**.
 - Although Alberta is currently a net exporter of agricultural products, issues of water scarcity and climate change present some uncertainties around the future of some agricultural sectors.

So what is the extent of the issue?

- GOA is not doing enough to **stop urban and rural residential sprawl**.
 - Existing policy is insufficient - agricultural producers may need some incentive to keep their land in agricultural production.
- Agriculture and Rural Development (ARD) along with Municipal Affairs (MA) were tasked with examining this issue.

So what is the extent of the issue?

The agricultural land base in Alberta is at risk due to increasing pressures:

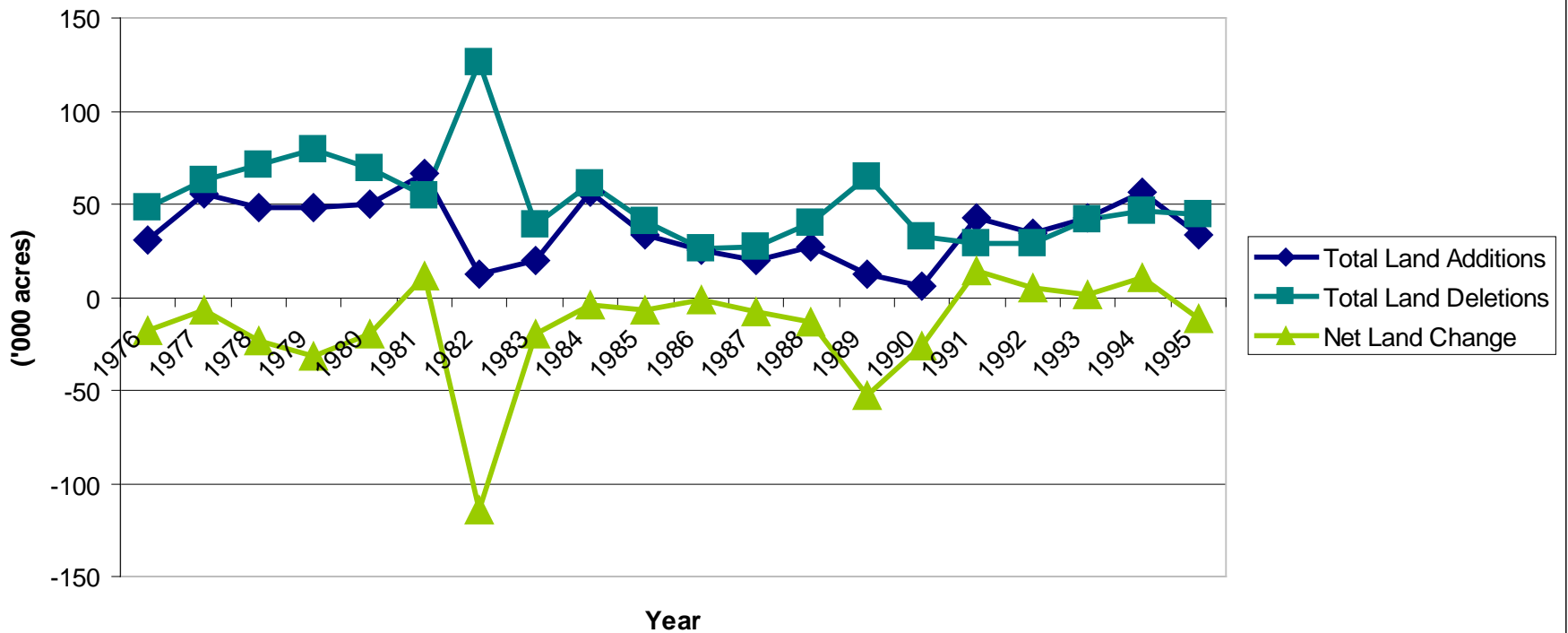
- ❑ Growth in the natural resource sector;
- ❑ Urban, industrial, and country residential development;
- ❑ Increased competition for land use;
- ❑ The limited and yet unknown quantity and quality of northern agricultural lands available for expansion; and
- ❑ The unknown effects of climate change.

ARD – Past Studies

- From 1976 to 2002, ARD monitored changes in the agricultural land base.
- From 1981 to 1995, the province has lost less than one tenth of one percent of farmland on a net basis, per five year reporting period.
- Much of the agricultural land converted to other uses during that time period was of high capability for annual cropping (AB CLI 1-3) and occurred within the more densely populated regions of the province (e.g., the Edmonton – Calgary corridor).
- Conversely, most of the land that has come into production (mainly from a series of public land sales between 1991 and 1995), has been of lower capability (AB CLI 4-7) located primarily in Northern Alberta.

ARD – Past Studies

Changes in the Alberta Land Base: 1976-1995



Limitations of Previous Studies

- Most recent data is from 1996
 - Prior to Alberta's most recent economic "boom";
- Data is not spatially aligned;
- Data is unavailable on LUF region;
- No current "baseline" from which to build new policy;
- Use of the CLI as a rating tool
 - "Capability" versus "suitability" system

Definitions - Fragmentation

- Occurs when once contiguous areas become divided into separate fragments isolated from each other by other, non-agricultural land uses.
- Can also occur within a parcel of land by access roads, oil and gas developments and/or linear infrastructure.



Definitions - Conversion



- A land-use change from an agricultural use to a non-agricultural use.
- Can be *temporary* (e.g., upstream oil and gas development) or *permanent* (e.g., country residential, urban and/or industrial development).

Current State

- Fragmentation and conversion is currently managed through the *Provincial Land Use Policies* (PLUPs) and local statutory land-use bylaws.
- Municipalities are “encouraged” to limit the fragmentation and conversion of agricultural land.
- The effectiveness of the PLUPs/local bylaws are not monitored.
 - ARD collected data from the early 1970s to 1996; monitoring was discontinued in 1996.
- The current “state” changed on August 22, 2012, with the release of the Lower Athabasca Regional Plan.

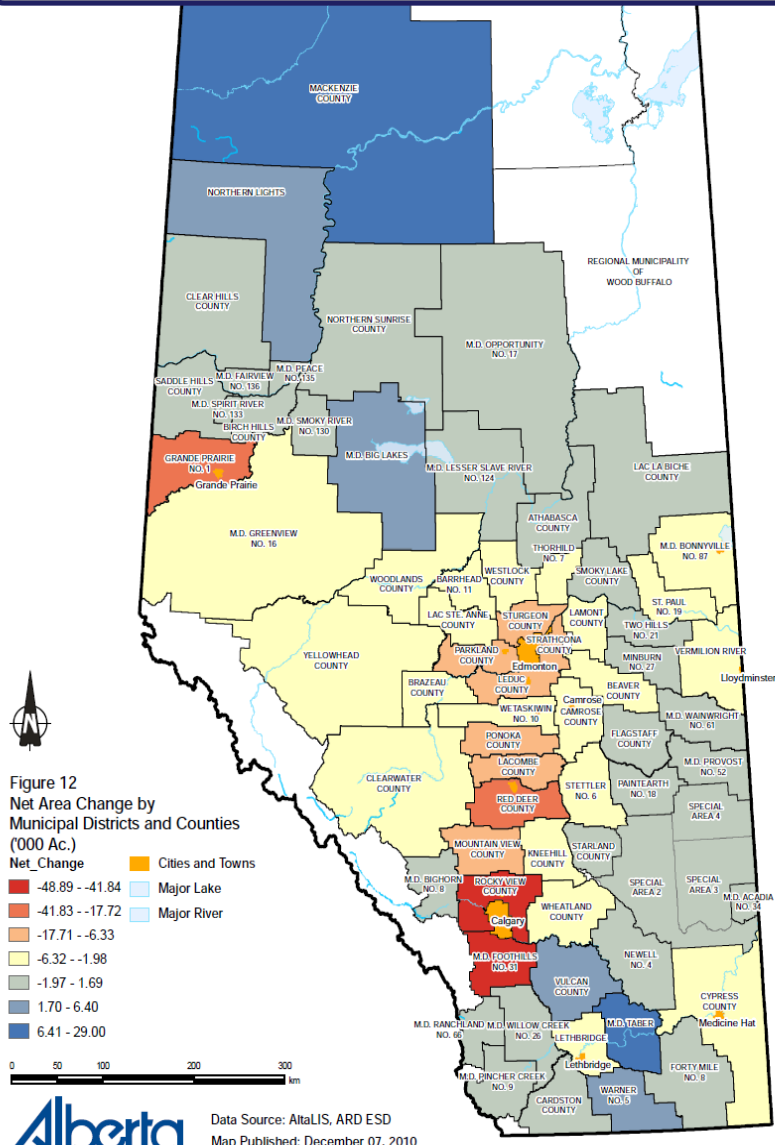
Work Leading to Policy Approach

- A consultant provided ARD/MA an estimate of provincial agricultural land-use changes since 1996:
 - Over 14 years ('96 - '09), Alberta experienced a net change (loss) agricultural land resulting from both permanent *and* temporary conversions of approximately 400,000 acres.
 - Permanent loss represented approximately half.
 - Represents 0.4% of the total agricultural land base.
 - Approximately 95% of the total land lost was LSRS 2 & 3.
 - Represents 0.8% of the total LSRS 2/3 land base

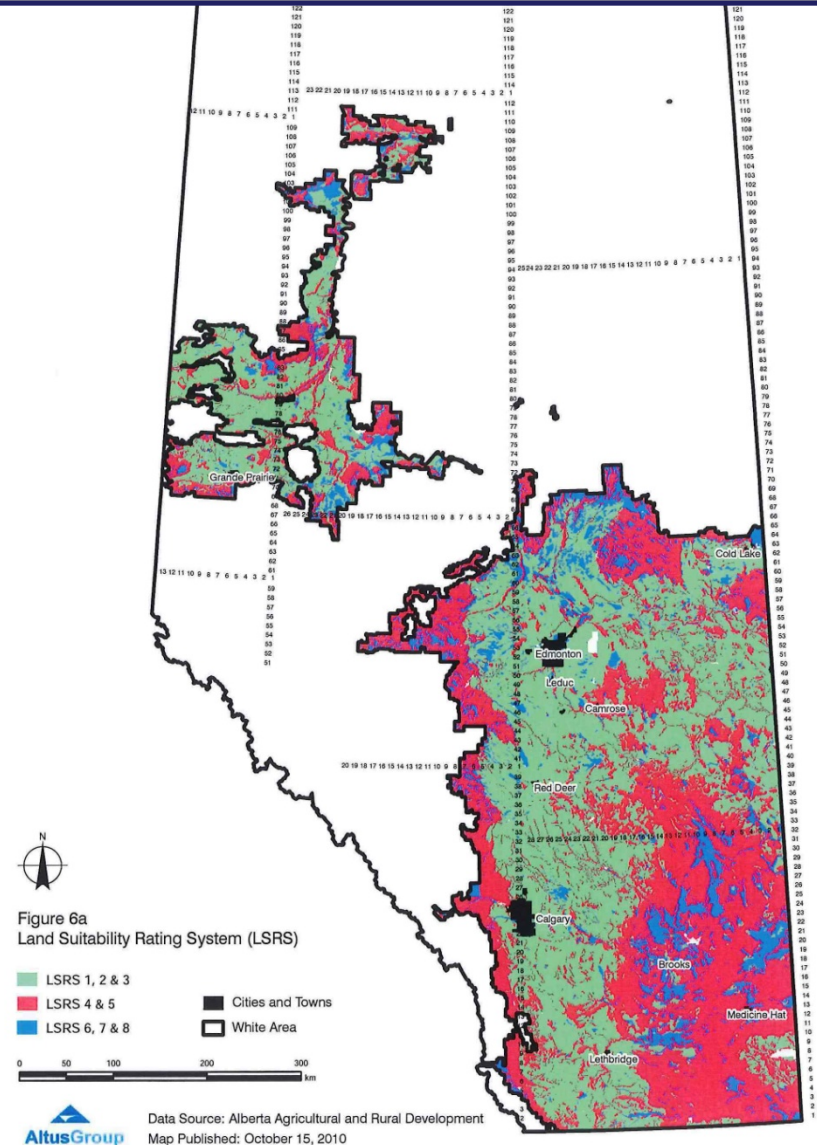
Work Leading to Policy Approach

- Trends were evident when assessed by LUF region; the largest loss of land occurred in the South Saskatchewan, North Saskatchewan and Red Deer regions (approximately 80% of total loss).
 - The Edmonton-Calgary corridor permanently lost approximately 183,000 acres, 86% of the total provincial loss.

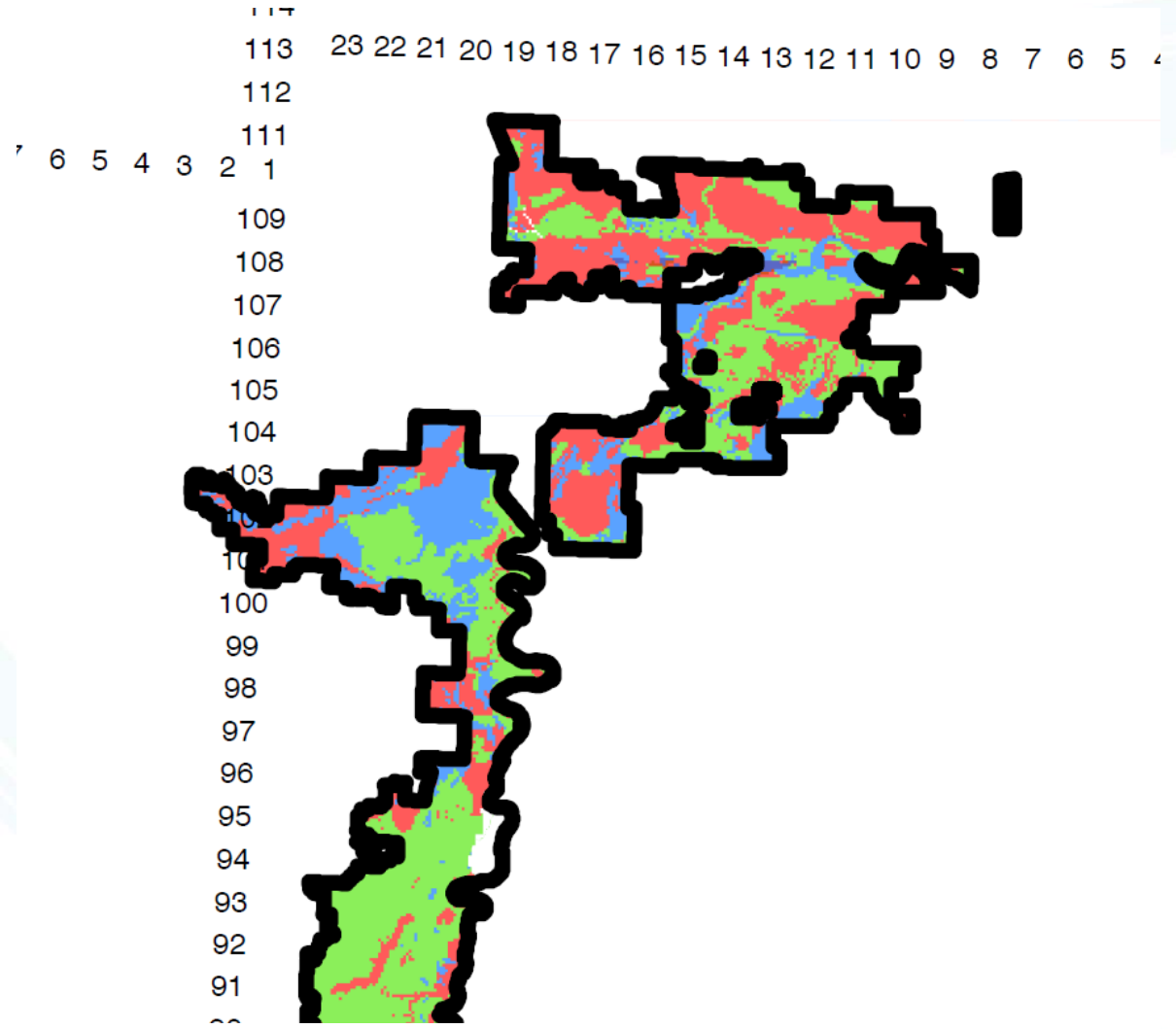
Net Area Change by Municipal Districts and Counties



Land Suitability Rating System for Alberta's Soils



Land Suitability Rating



LSRS 1, 2 & 3

LSRS 4 & 5

LSRS 6, 7 & 8

Cities and Towns

White Area

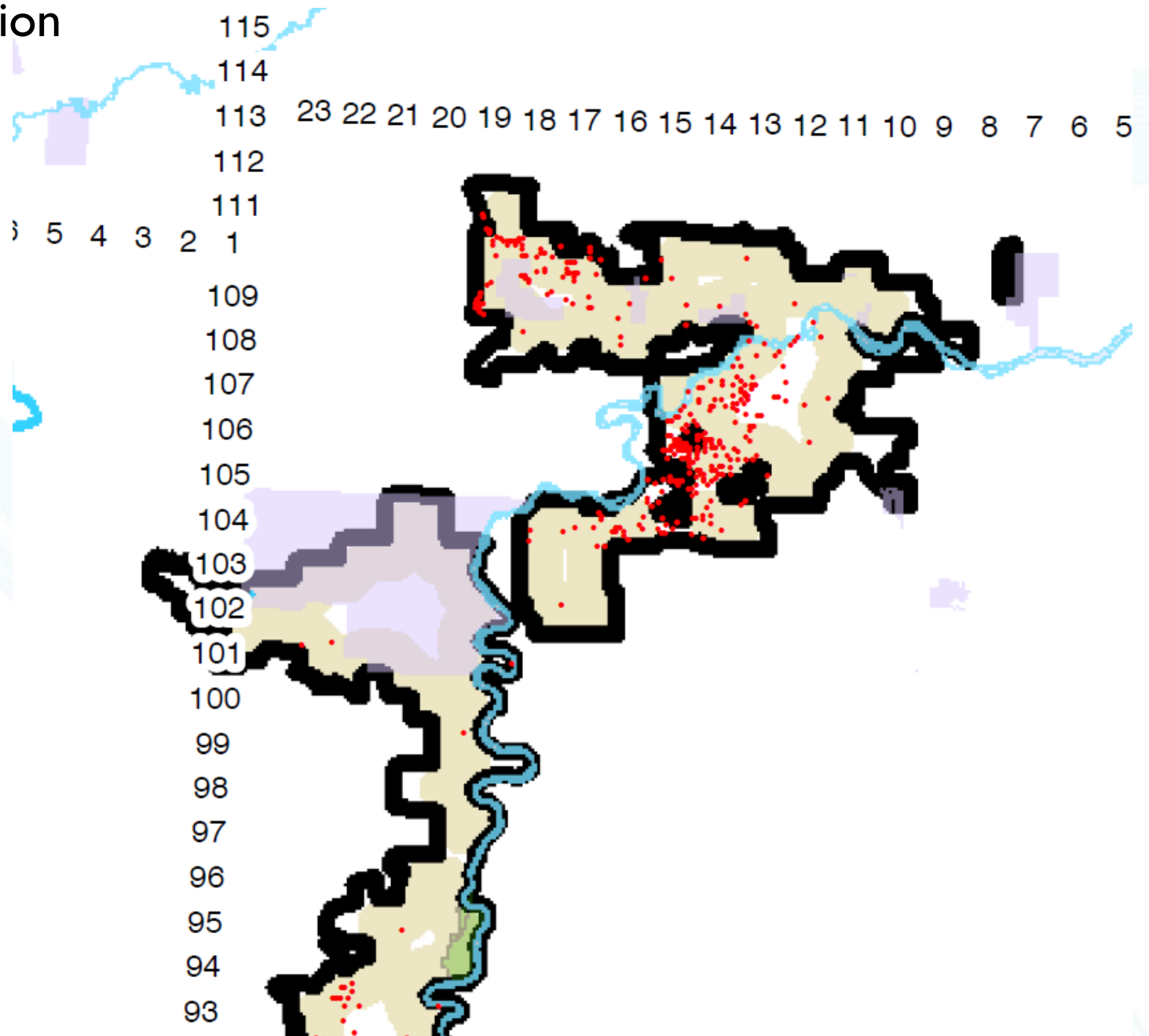


Work Leading to Policy Approach

DELETIONS:

- Deletions from agricultural use show an increasing trend over the past 15 years.
- Although oil and gas activity sharply declined from a peak in 2005, to a 15 year low in 2009, urban annexation and rural subdivisions countered that trend by increasing dramatically since 2006
 - Resulted in a net decrease in agricultural land.

Rural Subdivision

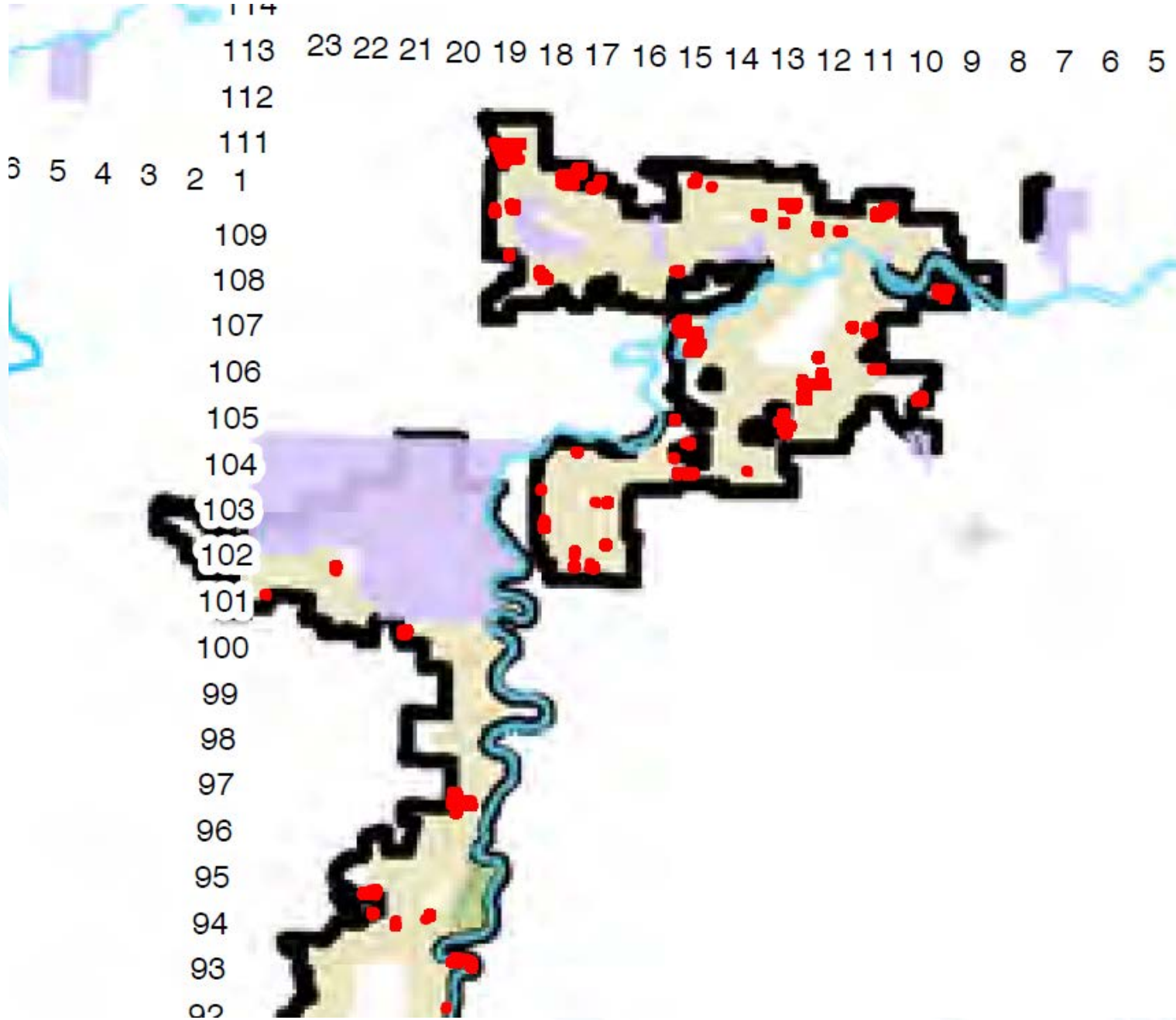


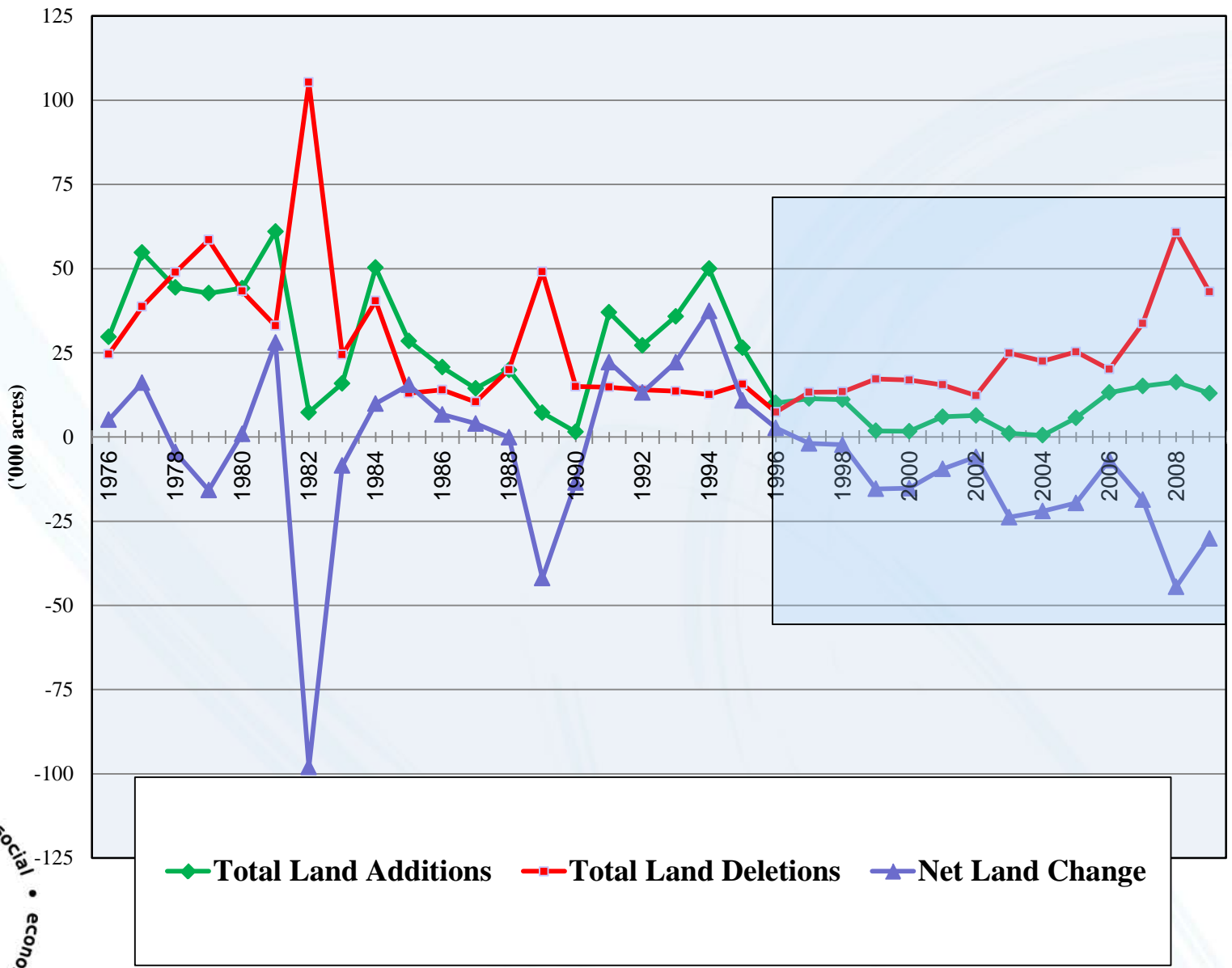
Work Leading to Policy Approach

ADDITIONS:

- Public land dispositions have increased since 1996.
 - Recent release of public lands in Mackenzie county (approx. 136,000 acres) significantly alters net loss.
 - Issue is changes in land quality and proximity to services.
- The reclamation rate of oil and gas well sites initially declined during the period from 1996 to 2003, but has since steadily increased.

Public Land Dispositions





Work Leading to Policy Approach

- A review of the effectiveness of the PLUPs suggest that there is significant variation as to how well municipalities have managed agricultural land-use issues; the process of developing and implementing policy would benefit from improved land-use data.
- Food “security” was considered a valid reason for reducing the fragmentation and conversion of agriculture land. While there are many definitions of food security, public focus on this area is increasing, and is particularly relevant for the major urban centres in the province.
 - The perception of the general public on food security and land loss is an important consideration regardless of its basis.

Work Leading to Policy Approach

That said...

- There is limited evidence that the current rate of fragmentation and conversion has had negative economic, environmental, and/or social consequences in Alberta.

While this may be true...

- The rate of fragmentation and conversion of farmland appears to have steadily increased in recent times, and this loss tends to be of high quality cultivated farm land.

GOA Approved Policy Direction

Continuation of the intent of the current provincial land-use policy through regional planning with the addition of regular monitoring, evaluation and reporting of agricultural land fragmentation and conversion by ARD.

Expectations under the LARP

- The Implementation Plan of the LARP sets future provincial direction on fragmentation and conversion of agricultural land.
- Although not strictly binding on decision makers, section 7 of the *ALSA* requires that decision makers and local government bodies consider the direction of the Implementation Plan in making their decision.
 - Decision makers must be able to respond to how these components were considered in land-use decisions.

LARP – Agricultural Content

Agriculture

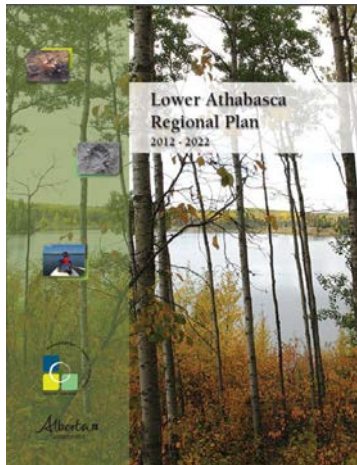
Objective: Maintain and diversify the region's agricultural industry.

Strategies:

- a) Municipalities are encouraged to **identify areas** where agricultural activities, including extensive and intensive agricultural and associated activities, should be the primary land use in the region.
- b) Municipalities are encouraged to **limit the fragmentation** of agricultural lands and their premature conversion to other non-agricultural uses, especially within areas where agricultural has been identified as a primary land use in the region.
- c) Where possible, municipalities are encouraged to direct non-agricultural subdivision and development to areas where such development will **not constrain agricultural activities** or to areas of lower-quality agricultural lands.
- d) Municipalities are encouraged to **minimize conflicts between intensive agricultural operations and incompatible land uses** by using appropriate planning tools, setback distances and other mitigative measures.

Indicator:

- Fragmentation and conversion of agricultural land to non-agricultural land uses.



LARP 2012-2022, pp.39-40

Legal Requirements - described

- ARD must be prepared and able to meet publicly stated requirements (i.e., indicator) as outlined in the Regional Plan.
- Direction on how this is to occur is provided within the Regional Plan itself:
 - Section 9 “*Regulatory Details Plan: Part 1 General*”, and
 - i.e., Reporting frequency
 - Section 48 “*Regulatory Details Plan: Part 8 Monitoring and Reporting*”
 - i.e., *What to report on*

Legal Requirements - described

- Reporting Requirements:
 - Establish and maintain a program of monitoring and evaluation on the status of the fragmentation and conversion indicator, and its overall effectiveness in responding to the issue,

and to

- Report not less than once in the first four years [from plan approval and implementation], and not less than once in the following five years.

Legal Requirements - described

- In reality, ARD's goal is annually with a roll up on a five year basis.
 - Eventual alignment of all LUF Regions.
 - Annual Report Card: provides the previous years information on the fragmentation and conversion of agricultural land.
 - Target: September, 2013
 - Five Year Report: Similar to ARD's historical reports; provides trend analysis and comment based on the previous five years of annual reporting.
 - Target: September , 2017

Metrics for Monitoring and Reporting

Landscape fragmentation comes from the discipline of conservation biology

- *Island Biogeography Theory*

Metrics are based on:

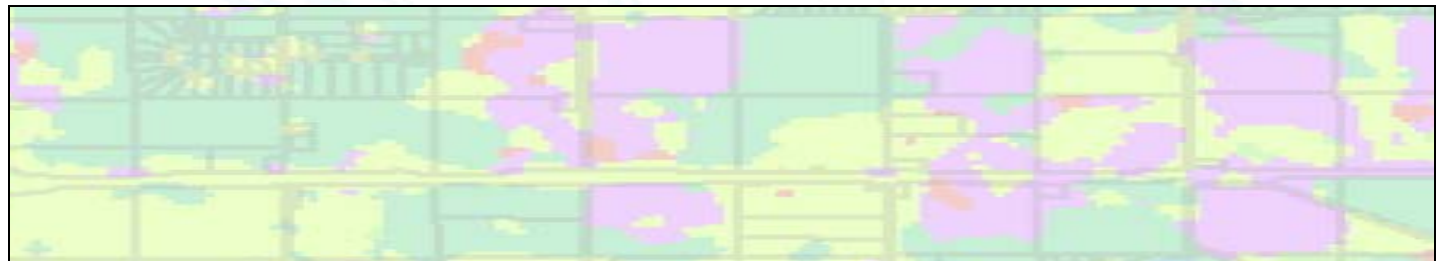
- Composition
- Configuration
- Contiguity
- Edge density and perimeter length
- Effect of disturbance zones



Metrics for Monitoring and Reporting

Correlation between all indices is expected as they are all based on similar basic parameters:

- Size
- Shape
- Distance



ARD Reporting Requirements

Fragmentation Parameter:

- More challenging to develop the methodology compared with land conversion.
- Employs a ‘Perimeter-to-Area Ratio’.
 - The perimeter (think: fence line) increases with each subdivision within a given area.
- The reporting area would be by municipality and Land Suitability Rating class.
 - Allows for roll-up to LUF region and the identification of provincial “hot-spots”.

ARD Reporting Requirements

Fragmentation Parameter:

- Absolute versus Risk-Fragmentation:
 - Difference: time frame of conversion.
- Absolute Fragmentation is identified by a physically-identifiable land-use change.
 - E.g., the parcel is developed within a year (i.e., reporting period).
- ‘Risk Fragmentation’ is identified based on changes in land-title without necessarily a physical change in land-use.
 - E.g., the parcel is sub-divided on the expectation that it will eventually be developed, but maintains current use.

ARD Reporting Requirements

Conversion Parameter:

- Represents the area extent of land-use conversion based on changes to the annual National Crop Inventory and infrastructure data.
 - Reported as temporary and permanent area converted.
- National Crop Inventory generalized to:
 - Water bodies
 - Exposed Land
 - Developed Land
 - Grasslands
 - Croplands (A and P)
 - Other (forest, wetland)

ARD Reporting Requirements

Conversion Parameter:

- Assesses year-to-year changes from one classification to another.
 - e.g., Cropland to Developed Area or Water Body (slough) to Cropland.
- Area reported by municipality and by Land Suitability Class.
 - Allows for roll-up to LUF Region and the identification of provincial “hot-spots”.

ARD Reporting Requirements

- Both absolute and risk fragmentation indices along with the conversion indicator will be reported annually.
 - Temporary and permanent considered
- Values published online on both the ARD and Land-use Framework websites.
- Five-year roll-up, analysis and interpretation will be completed and posted online, similar to the historic loss and fragmentation reports.

Expectations from Reporting

Published information can be used to:

- Inform the public.
- Assist municipalities and other land managers in making land-use planning decisions.
 - e.g., assist in the development/updating of statutory plans.
- Will be used to inform, over time, the potential need for further policy development.
 - Based on the extent of fragmentation and conversion observed.

Thank-you

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