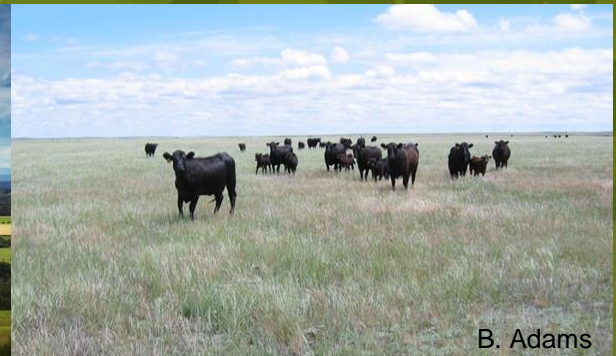


# Innovative Approaches to Support Conservation Outcomes; Examples From Collaborative Initiatives in Alberta



Finding Common Ground  
Between the Agricultural  
Industry and Wetland Policy  
April 19, 2018  
Leduc, Alberta

*Alberta*   
Government

Karen Raven P. Ag.  
Alberta Agriculture and Forestry

# Overview

- **Why Do We Need Innovative Strategies?**
- **Collaborative Approaches, Offsets, Ecosystem Services**
  - Alberta Prairie Conservation Forum and Alberta NAWMP
  - Southeast Alberta Conservation Offset Pilot
  - Red Deer County ALUS Prioritization Project
- **Models and Assessments**
  - HOLOS analysis of Economic and GHG impacts impacts of BMPs
  - Alberta Peas Lifecycle Assessment and Environmental Product Declaration
- **Challenges and Successes**

# Why do we need innovative strategies and policy tools?

- Status Quo is not working
- Regulation is one tool
- What works now may not in the future
- Incentive or certification based approaches can drive positive change
- Recognition of private costs for public benefits
- Integrated approaches for multiple benefits



# Beneficial Management Practices for Renewable Energy Projects; Reducing the Footprint in Alberta's Native Grassland, Parkland and Wetland Ecosystems

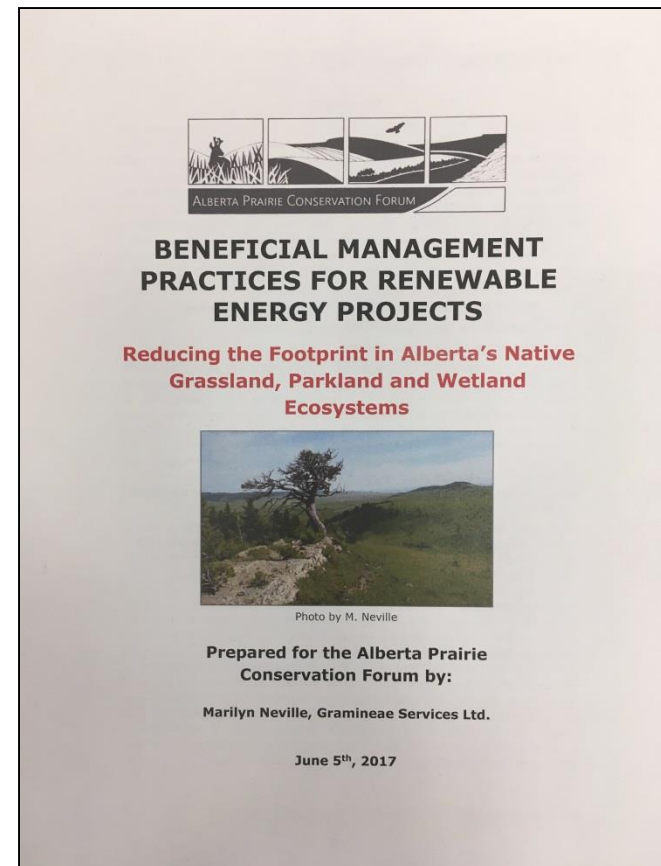
Alberta Prairie Conservation Forum  
Alberta NAWMP  
Gramineae Services Limited



# Reducing the Footprint in Alberta's Native Grassland, Parkland and Wetland Ecosystems

## Prairie Conservation Forum and Alberta NAWMP Partnership:

- Multi-stakeholder workshop
- Occasional Paper
- Extension materials for key audiences





# Southeast Alberta Conservation Offset Pilot

K. Raven, R. Dunn, T. Goddard, M. Weber, T. Zimmerling, B. Downey, P. Jones,  
K. Redden, J. Nicholson, D. Eslinger, S. Petry, B. Adams, M. Alexander, D. Britton, R. McNeil

# Offset Pilot

## Multi-stakeholder Partners:

- Within Government of Alberta
- Alberta Conservation Association
- Alberta Innovates Technology Futures
- Alberta Innovates Bio Solutions
- Dr. C. Gates, University of Calgary
- Alberta Biodiversity Monitoring Institute
- Industry (Oil and Gas, Wind, Utilities)
- Landowners
- University of Alberta
- LandWise Inc.

**Collaborative dialogue and decision making**

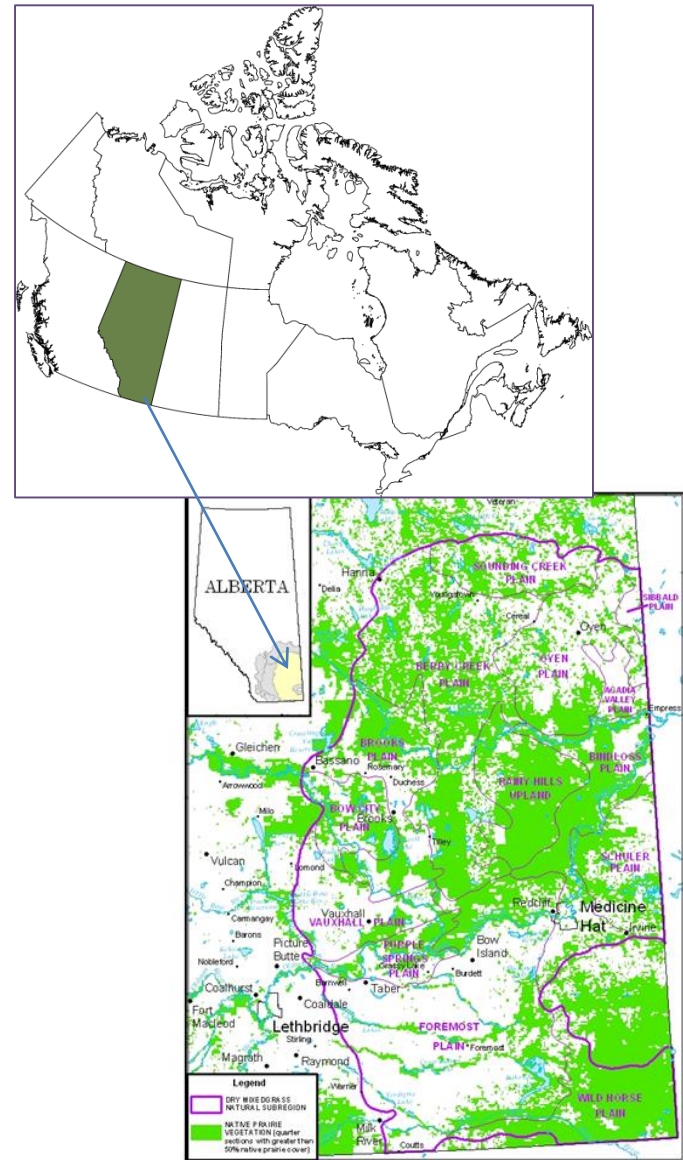
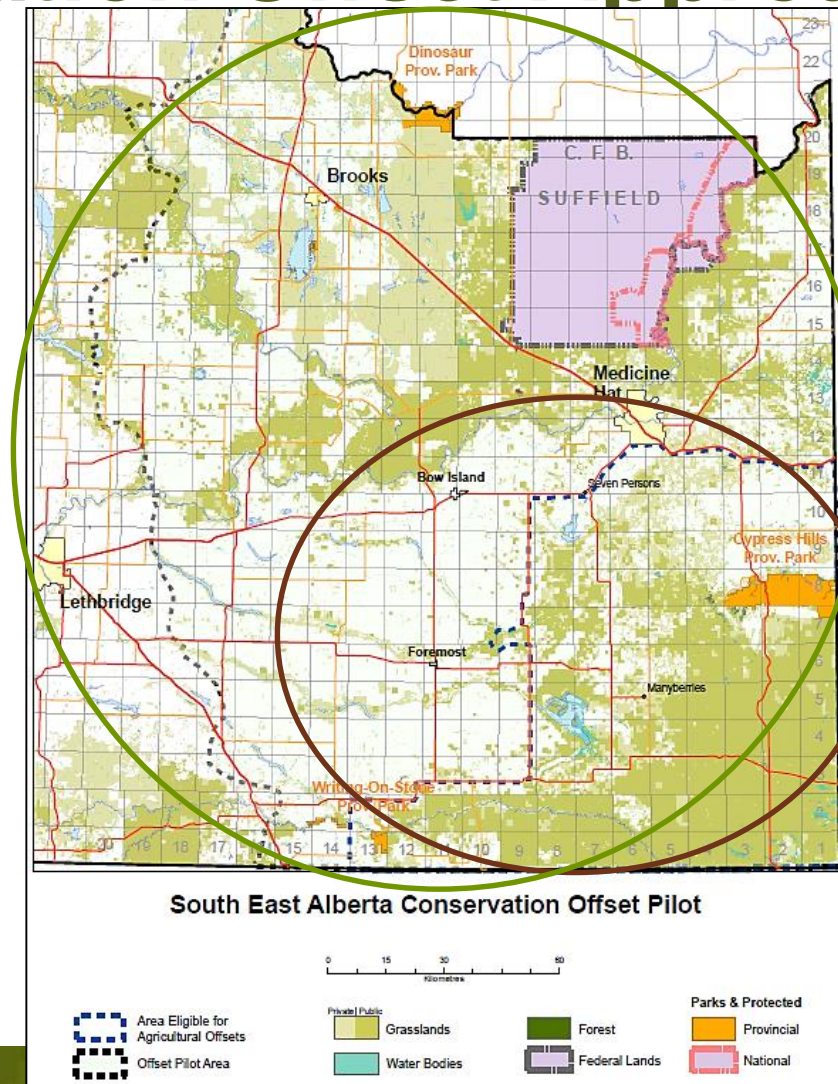


Figure 2: Ecoregions in the Dry Mixedgrass Natural Subregion

# Conservation Offset Approach

Voluntary Offset for any new industry impacts on native prairie within the Dry Mixedgrass Natural Sub-region



Agricultural offsets to incent conversion of marginal cropland to native species mix within high priority areas



# Offset Suitability Index

**Develop an approach to target voluntary offsets on private agricultural land parcels with the best potential to improve landscape level native wildlife habitat.**

## **Method:**

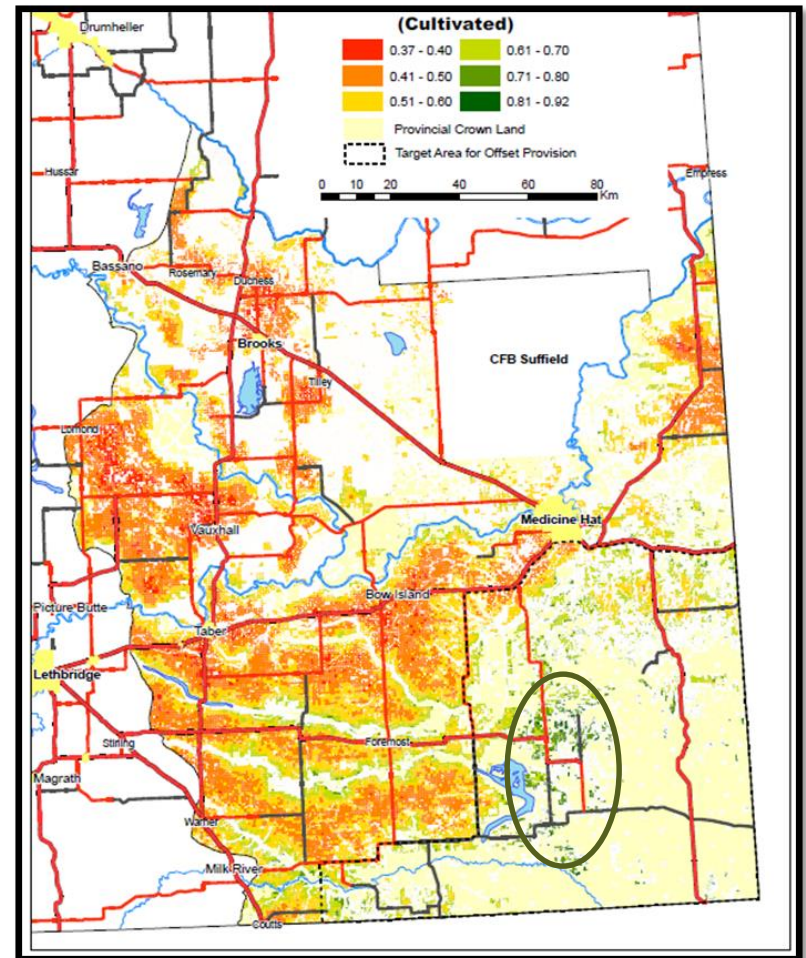
- **Workshop 1**
  - Identify important factors to achieve outcomes
- **Identify or develop GIS supported data for factors**
- **Participants complete Delphi process and Analytical Hierarchy process**
- **GIS analysis**
- **Final decision support map**



# Results:

Offset suitability index based on  
17 ranked criteria

- Land Use Intensity
- Native Prairie
- Native Prairie Block
- Proximity to critical habitat
- Riparian, Lentic and Lotic
- Ungulate winter range
- Movement corridors
- Ecologically sensitive areas
- Parks & Protected areas
- Proximity to critical sage grouse habitat....



# Alternative Land Use Services (ALUS) Prioritization Tool

## Red Deer County ALUS Program

Red Deer County ALUS Committee, Ken Lewis, Mathew Muehlhauser, Karen Raven, David Spiess, David Hildebrand, Longin Pawlowski

# Red Deer County ALUS Prioritization

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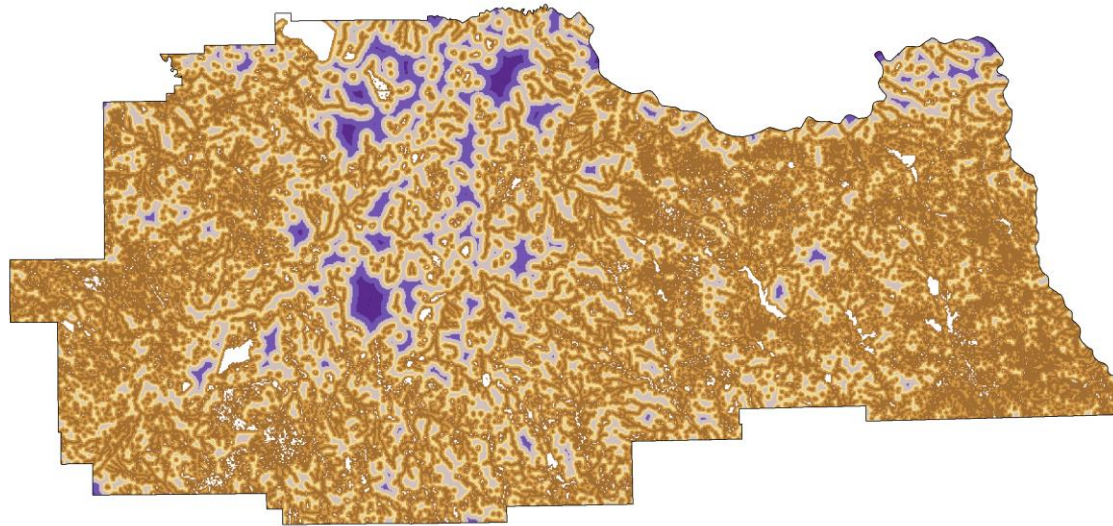
- **ALUS Prioritization Statement**

“The ALUS Prioritization Process will allow Red Deer County to target the ALUS Program on those riparian areas (on agricultural lands) with the greatest potential to increase ecosystem services.”

**Additional emphasis identified in workshops:**

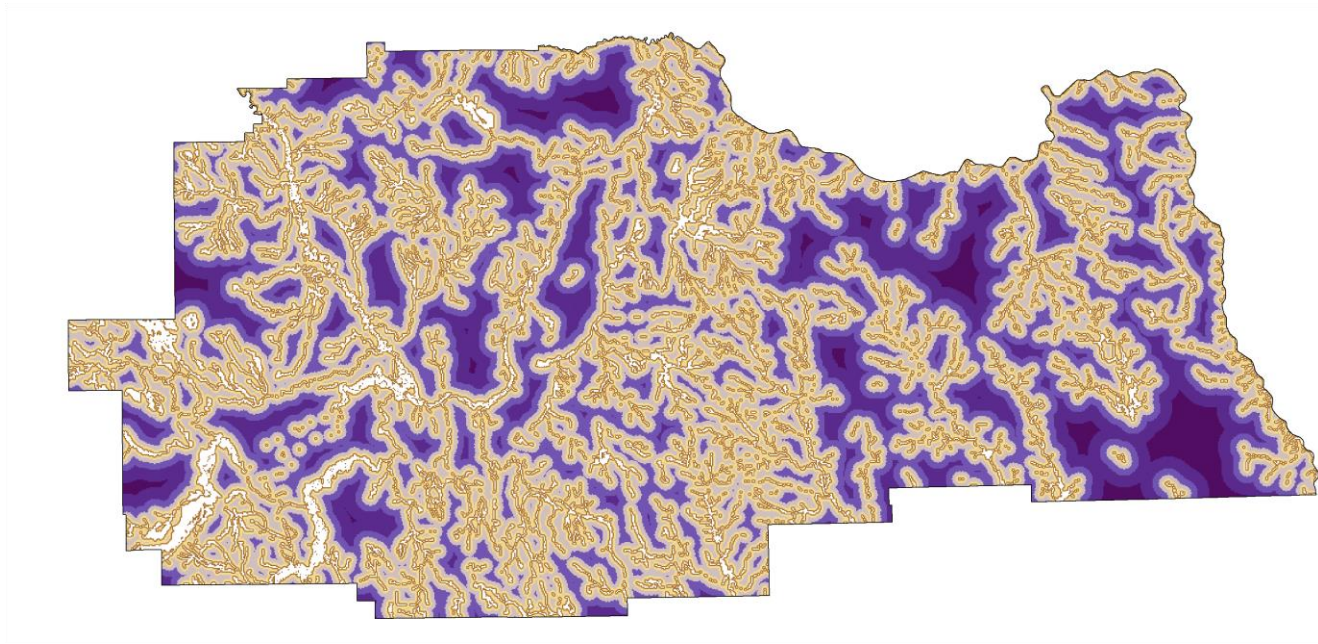
Upland areas, go beyond riparian, other ecosystem services, ensure high value ag lands remain.....highlight complementarity of ag and environmental stewardship.....

# WBCO –Density of All Wetland Classes & Stream Orders-



provincial wetland inventory, ordered stream network

# RFWF – Riparian Function, Water Filtration



Government of Alberta Riparian mapping project  
Quality update spreadsheet, wetlands inventory and stream network

# SCAR - Scarcity of the Habitat or Land Form

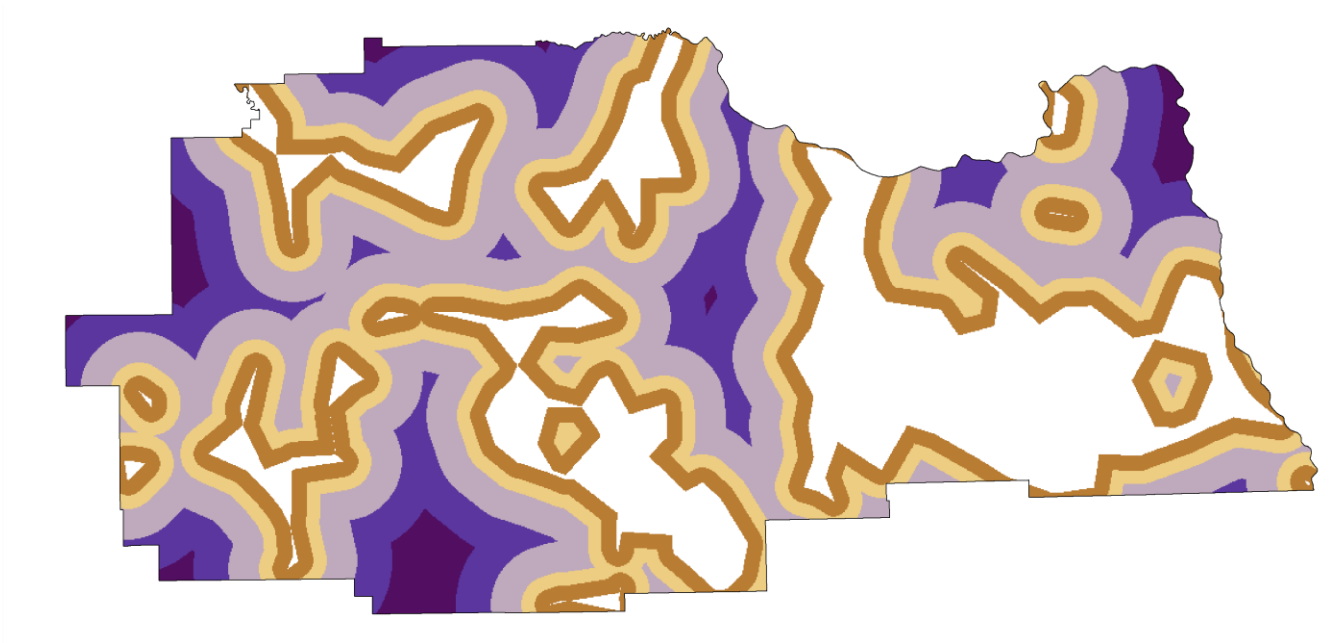
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**Ecologically significant Areas (ESA)**

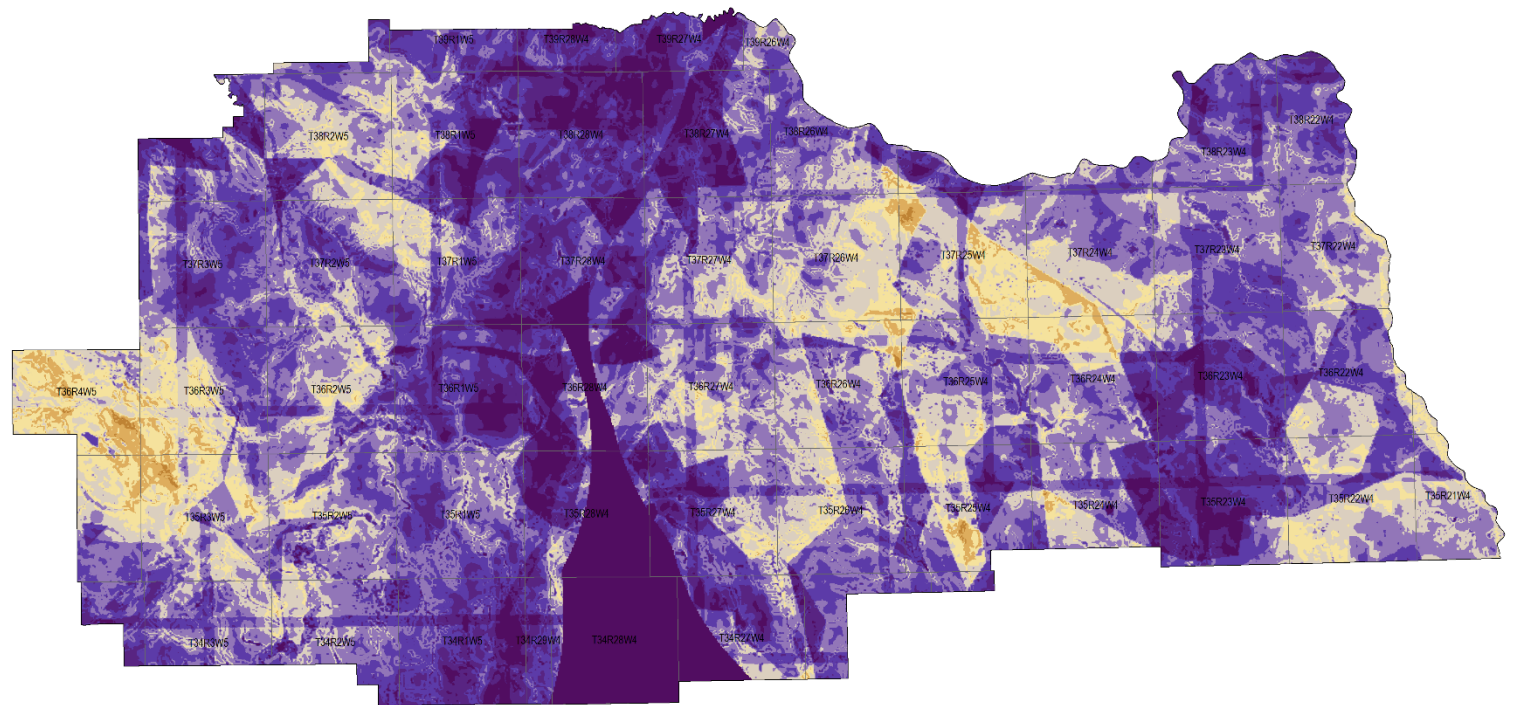
# H4SAR – Scarcity of Habitat for Species that are Endangered or At Risk

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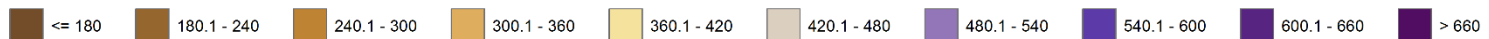


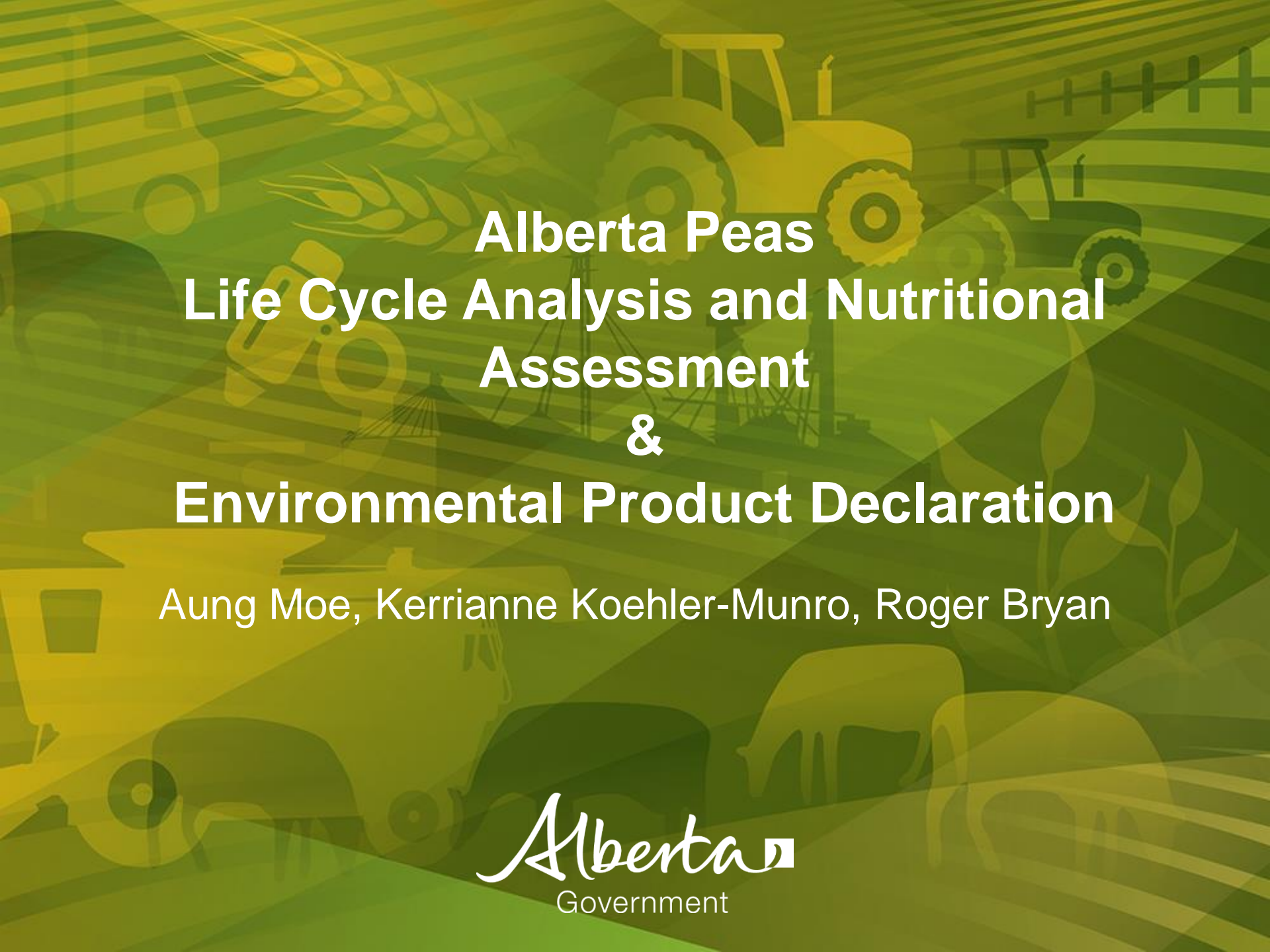
**Density of occurrence of species sightings**

# Final Ranked Factor Map: Priority areas identified for Ecosystem Services associated with riparian areas and other values



**Suitability Rating**



The background is a green-toned collage of agricultural imagery. It includes stylized tractors, stalks of wheat, a fence, and cows grazing in a field. The text is overlaid in the center in a clean, white, sans-serif font.

# **Alberta Peas Life Cycle Analysis and Nutritional Assessment & Environmental Product Declaration**

Aung Moe, Kerrianne Koehler-Munro, Roger Bryan

# Nutritional and Environmental Assessment of Alberta peas

## • Lifecycle Assessment

### Measuring the Environmental Footprint of Alberta Peas

Sustainability of agri-food systems has never been more important than it is today. To gain a comprehensive understanding of sustainability performance and identify opportunities for improvement, the Alberta Pulse Growers (APG) collaborated with Alberta Agriculture and Forestry (AF) to conduct an Alberta pea environmental footprint assessment using a method called life cycle assessment (LCA).

LCA is a holistic yardstick of the environmental performance of products and services. It measures how much environmental impact the production of a product contributes throughout its life. It looks at all significant environmental impacts including carbon footprint, water footprint, eutrophication, acidification, photochemical smog, etc.

"Having a published LCA number is not the overall objective of the process," explained Nevin Rosaasen, APG's Policy and Program Specialist. "Conducting an LCA sets a benchmark, identifies certain 'hotspots' where best management practices, employing targeted fertility programs, and other extension opportunities to growers on how they can save money and produce food more efficiently are other motivators."

Recently, LCA has become a mainstream method for environmental sustainability assessment being used by many agriculture commodities to measure and communicate their environmental footprint. LCA is also being endorsed by international organizations (e.g. the United Nations Environment Programme (UNEP), the UN Food and Agriculture (FAO) and the European Union (EU)) and a leading global non-profit organization such as The Sustainability Consortium (TSC).

"Using an internationally accepted method such as LCA, it provides this work with credibility, transparency and reliability," said Aung Moe, AF's Environmental Footprint Agrolgist and a certified LCA professional. "It is clear, consistent and flexible enough to run the model repeatedly. Which means we can go back to the model again and again as new technologies, new varieties and new management practices are available."

An LCA provides a baseline for the environmental footprint and identifies environmental hotspots (activities or operations which contribute

to the greatest environmental footprint) which identify opportunities for improvement of the environmental performance. This information can also support business decision making for cost saving.

Farm data from Alberta pea growers was collected for the 2015 crop year on crop yield, farm inputs (seed, inoculant, fertilizers, herbicide, fungicide and desiccant), field operations (seeding, chemical application and harvesting) and transportation distances for farm activities and deliveries.

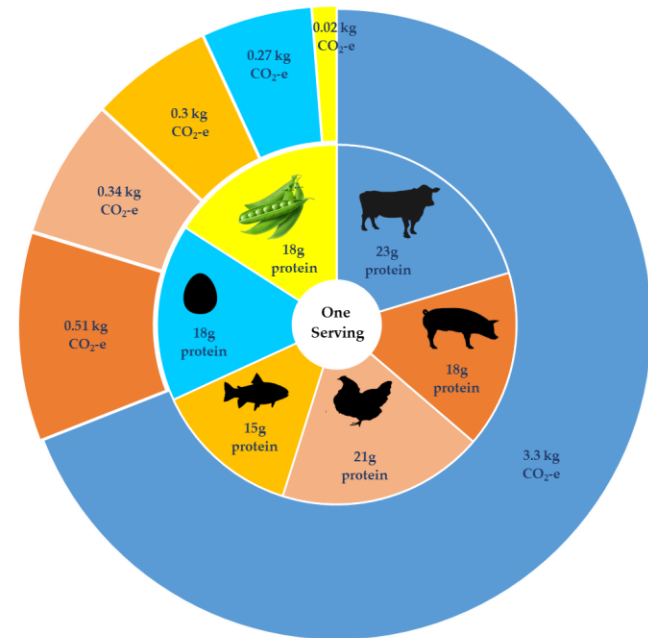
Additional information and data from regional sources (emission factors) as well as international life cycle inventory database (Ecoinvent) was used for modelling. Environmental footprints of Alberta pea from "cradle" (all inputs starting at extraction and production) to farm gate were calculated based on ISO 14040 and 14044 standards from International Organization for Standardization (ISO).

**Key Findings of the LCA**  
Crop inputs and field operations were major contributors to the carbon footprint and other environmental footprints of Alberta pea

production. Synthetic fertilizers, particularly phosphorus fertilizer and field emissions accounted for a majority of the environmental footprints from crop inputs. Fuel consumption and emissions associated with field operations contributed to a large proportion of the environmental footprints from field operations. Grain drying and storage contributed to a lesser degree of environmental footprints compared to crop inputs and field operations. Environmental footprints associated with transportation were quite negligible, accounting for less than one per cent of total environmental footprints.

Alberta pea's carbon footprint was 0.183 kg CO<sub>2</sub>e/kg of pea at farm gate. The unit is carbon dioxide equivalent, meaning all greenhouse gases in a common unit. Alberta pea production contributed to a lower carbon footprint than other crops because of less nitrogen (N) fertilizer required and the adoption of a no-till system. Less N fertilizer requirement for pea production reduces the nitrous oxide emissions (which is more potent than carbon dioxide and has a great global warming impact), resulting in a lower carbon footprint. Additionally, a no-till system

**At farm gate,  
Alberta Peas  
Carbon Footprint  
is 0.183 kg CO<sub>2</sub>e/kg!**



# Alberta Peas



The screenshot shows the homepage of the International EPD System. The header has three tabs: 'Using EPD', 'Creating EPD', and 'Product Category Rules (PCR)'. Below the header is a navigation bar with links: 'What is an EPD?', 'Search the EPD database', 'The International EPD® System', and 'News'. The main content area features the title 'THE INTERNATIONAL EPD® SYSTEM' and a paragraph explaining that an EPD is a document communicating verified, transparent, and comparable information about the life-cycle environmental impact of products. It also states that the International EPD® System is a global programme for environmental declarations based on ISO 14025 and EN 15804, with an online database containing more than 800 EPDs for a wide range of product categories by companies in 39 countries. A search bar is located below this text, with a placeholder 'Search for: Product name, Company, EPD Number or reg no, ECO platform' and a 'SEARCH' button. To the right of the main text is a vertical banner with the text 'CAS' and 'For Ke EPD s improv perform'. Below the main content area is a section titled '> Latest EPD certificates' featuring four 'NEW' certificates. The first certificate is for 'Alberta Pulse Growers Alberta Peas'. The other three are for 'ISKO Division - Sanko Tekstil Isletmeleri San. ve Tic. A.S.' for 'ISKO 26610 Basic denim fabric', 'ISKO 26610 Preliminary denim fabric', and 'ISKO 26610 Finished denim fabric'.

Using EPD   Creating EPD   Product Category Rules (PCR)

What is an EPD®?   Search the EPD database   The International EPD® System   News

## THE INTERNATIONAL EPD® SYSTEM

An Environmental Product Declaration (EPD) is a document that communicates verified, transparent and comparable information about the life-cycle environmental impact of products.

The International EPD® System is a global programme for environmental declarations based on ISO 14025 and EN 15804. Our online database currently contains more than 800 EPDs for a wide range of product categories by companies in 39 countries.

Search for: Product name, Company, EPD Number or reg no, ECO platform   **SEARCH**

CAS

For Ke EPD s improv perform

### > Latest EPD certificates

**NEW**



Alberta Pulse Growers  
Alberta Peas

**NEW**



ISKO Division - Sanko Tekstil Isletmeleri San. ve Tic. A.S.  
ISKO 26610 Basic denim fabric

**NEW**



ISKO Division - Sanko Tekstil Isletmeleri San. ve Tic. A.S.  
ISKO 26610 Preliminary denim fabric

**NEW**



ISKO Division - Sanko Tekstil Isletmeleri San. ve Tic. A.S.  
ISKO 26610 Finished denim fabric

- First agri-food commodity to have a certified environmental product declaration (EDP) in North America



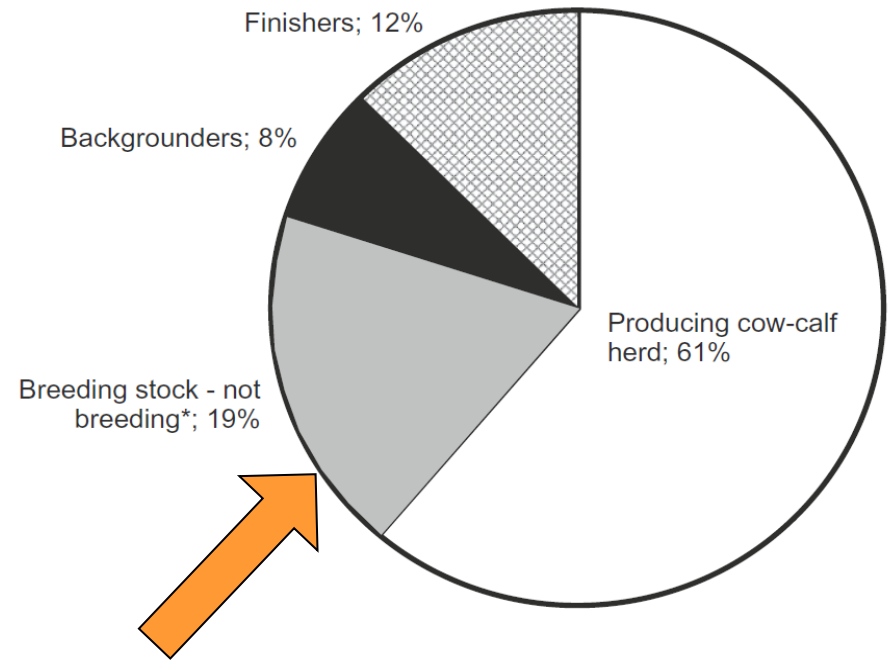
# Economic and GHG Impacts of Winter Feeding Non-Pregnant Cows

*Sheilah Nolan, Olivia Sieniewicz and Barry Yaremicio*  
*Alberta Agriculture and Forestry*

# Context

- Carbon footprint of beef concerns consumers and multi-national companies
- Farmers and ranchers want to show they're good stewards, and remain in business
- Efficiency improvements have reduced GHG by 15% from 1990 to 2011 (*Legesse, et al., 2015*)

Can cow-calf operators continue to lower GHG emissions and costs?



*Beauchemin et al 2010, Life cycle assessment of GHG emissions from beef production in western Canada: A case study, Ag. Systems (103) 371-379*

# Vulcan Case Study

## Goal:

- Identify management options for cow-calf operators that can increase productivity (\$ / unit) and reduce GHGs (CO<sub>2</sub>e / unit)

## Baseline:

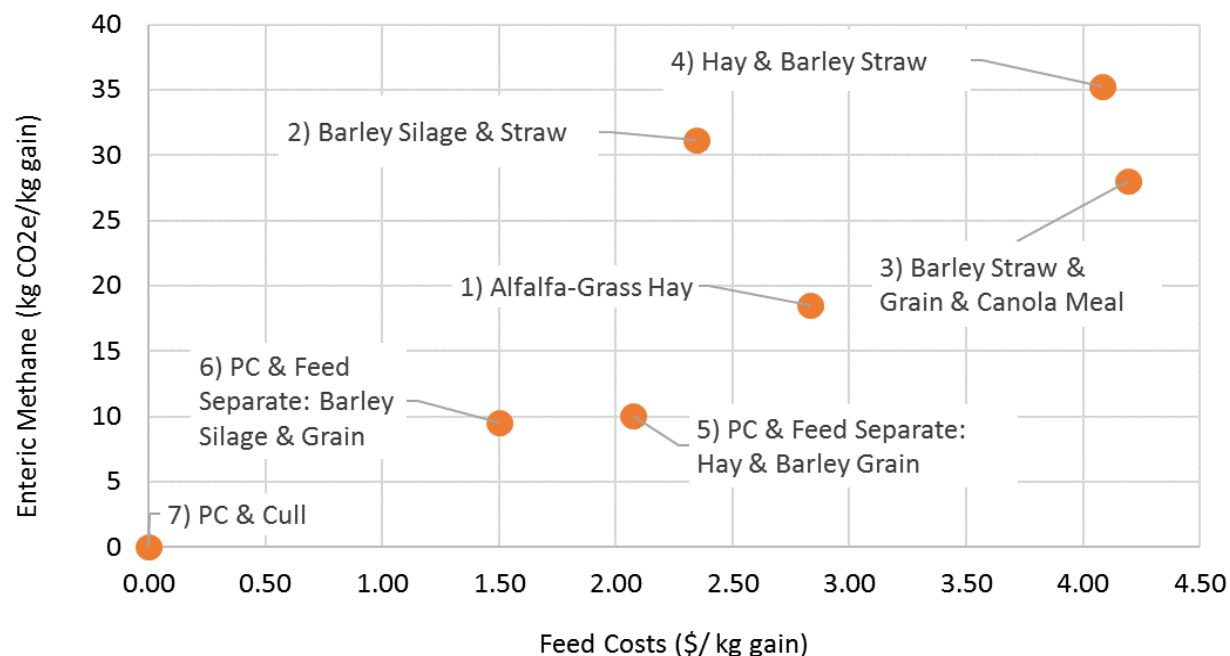
- AAFC case study of GHG from beef production, Vulcan
- Management Options: Winter feeding diets for non-pregnant (open) cows



HOLOS is a whole-farm model and software program that estimates greenhouse gas (GHG) emissions based on information entered for individual farms.

<http://www.agr.gc.ca/eng/science-and-innovation/results-of-agricultural-research/holos-software-program/?id=1349181297838>

# Emissions and Costs per kg Gain



**Opportunity to lower costs and emissions by culling, but if choosing to not to cull**

- Efficiency gains may be possible using different diets to lower costs and emissions
- Subject to changes in diet ingredients and feed prices

# Challenges and Successes

## Challenges

- Need multiple tools to achieve conservation objectives
- Models –data and expertise
- Policy gaps can limit opportunities and outcomes
- Voluntary approaches may not be economically viable
- Ensuring an integrated, landscape level approach
- Acting locally or Provincially with international implications

## Successes

- Multi-stakeholder Collaboration
- Leveraging Scarce Resources
- Ensuring an Integrated Approach
- Minimizing potential unintended consequences
- Recognizes incentive based or non-regulatory approaches
- Recognizes economic efficiencies and environmental stewardship

# Questions?

[karen.raven@gov.ab.ca](mailto:karen.raven@gov.ab.ca)



Photo: Ducks Unlimited