

Prairie Conservation Forum Annual Meeting

State of the beef industry and implications for conservation.

Presenter Norm Ward

Beef industry and conservation- past and present Review of a few management principles in a grassland ecosystem Microbes – its what's for dinner tonight Government conservation management Bringing it all together – A holistic view of politics and the environment **Grassland Capital X**

Beef Industry Past and Present

Year 1881 46 <u>Grazing Leases</u> were given out by the Canadian Federal Government, some more than 100,000 acres

- reasons given were to stop American beef coming in to supply Government contracts, to help supply breeding stock to more settlers, and promote trade with England

 the real reason may have been - the railway was yet to reach Calgary until 1883 and McDonald needed to express sovereignty on Western Canada before the Americans did.

In contrast on the US side of the border - there was a "tragedy of the commons" occurring with the absence of grazing leases/property rights and no one to take responsivity for the **land**.

Were the grazing leases an inadvertent conservation directive or conservation area by the Federal Government?

- there was an attempt by Government on the first leases to forbid sheep given the type of grazing practices, but the legislation was eventually softened to allow sheep by ministerial order.

- we now know that it is not the type or number of grazing animals but how long the animals are allowed to graze and how long forage is allowed to recover after grazing.

Market Based Grassland Conversion

1881

- Grassland and the environmental services it produced were bountiful and thus had a low value.

- By 1892 a shift was starting to occur. New settlers valued crop production over cattle and new marketplace caused land conversion from grass to plow.

- Over the next 141 years an estimated 74% of grassland in Canada has been converted to industrial use and farming.

2023

- Grassland and the environmental services it produces are still under valued and we have a tragedy of the grassland commons.

- Since there is no marketplace for grassland environmental services their value is essentially zero.

- ES needs to be fungible and part of an environmental marketplace.

Other Factors Causing Grassland Conversion



- Extended multi year drought in Western Canada has continued to reduce beef cattle numbers. Recent 2024 USDA numbers indicate a Canadian beef cow herd of 3.4 million, down from 3.7 last year which was also down from the previous year.

- Subsidized crop insurance pay outs are significantly higher on farmed crop land vs grassland. Crop insurance encourages grassland conversion.

- Most types of production Agriculture have been able to scale except for the cow/calf sector. Lower net income from cow/calf operations means fewer young people willing to enter the sector. The Ranching for Profit schools are not an oxymoron.

- As ranchers age it is harder to manage cow/calf production. Good prices for cattle last fall created another exit point for aging ranchers.

The median age of farm operators has risen to 58. Ranchers as a subset may be older.



Grazing Management

Time Magement

Grazing in smaller and smaller increments of time.

This allows for higher animal density and a longer recovery time for grazed plants





BRITTLENESS SCALE



According to the brittleness scale, a rainforest would be a 1 and a desert would be a 10.





Characteristics of brittleness scale

- Good moisture throughout the year
- Fast start from smooth surface
- Decay of old plant parts
- Plant spacing are tight
- When rested the community becomes tighter

- Poor moisture through the year
- Slow start from smooth surface
- Chemical oxidation or weathering of plant from the top down
- Plant spacing are very wide
- When rested the community becomes simpler or unstable





5 Principles of Soil Health

Understanding Ag

- No Bare Ground
- Living Roots in the Soil as long as Possible
- Minimal Soil Disturbance
- Maximum Biodiversity Above and Below Ground
- Integrate Livestock

Grassland in the Cranbrook BC area Total rest from domestic grazing for 29 years



Figure 1. The primary microbiotas of ruminants characterized by different bacterial phyla.



INRAE Productions Animales, 2020, numéro 4

PLANT AND ANIMAL MICROBIOME

Plants naturally carry microbes on seeds and within seeds that may facilitate development and early survival of seedlings.

Elsevier Current Plant Biology Vol 23 Sept 2020,100161





Plants absorb energy from the sun, which powers the carbon cycle

Plants break down water (H₂O) from the soil into hydrogen (H) & oxygen (O₂)

Oxygen is released back into the atmosphere

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SOIL

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Plants pull CO₂ from the air and bind it to hydrogen from the H₂O, which makes sugar (CH₂O)

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THE CARBON CYCLE

Strategically grazed livestock trample and naturally fertilize the land, producing more carbon and life in the soil

> Microbes pull nitrogen from the air, converting it to a form plants can use.

> > lutrients

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A summer and the good provided with the

Biogenic Carbon Cycle



Methane Cycle

Methane is part of a natural – or biogenic – carbon cycle, in which the methane breaks down into carbon dioxide (CO2) and water after about 12 years. Grass then absorbs the CO2 through photosynthesis, cows eat the grass, and the cycle continues.

Meat and Livestock Australia

Scapegoating and eliminating livestock without regard for how food is produced does nothing to encourage better earth stewardship. The Regeneration, Meg Chatham

- CH4 is also eliminated from the atmosphere by uptake in upland soils due to microbial oxidation by methanotrophs (estimated at 5% of the microbial sink) (Conrad, 2009).
- Recent research indicates methanotrophs in the soil with a functioning water and mineral cycle and adaptive grazing management may use significantly more methane produced by ruminant animals in the same paddock.
- Grazing forage high in Total Digestible Nutrients, characterized by adaptive grazing, may reduce methane production – 8-hour rule
- Adding a feed supplement, which alters rumen microbe populations, to cattle grazing forage high in cellulose, may reduce methane production.

BUILDING A LEGACY OF GRASSLANDS CONSERVATION

GRASSLANDS CAPITAL X

The purpose of the exchange was three-fold.

- Use a market-based mechanism to promote and make fungible the environmental services provided by grazers in a grassland ecosystem.
- Provide a means to not only create healthy environmental succession in a grassland environment but to also create healthy generational succession of ranchers and their families.
- Take a holistic approach to the grassland environment



How it Works in a Voluntary Marketplace

Grassland Sellers – ranchers and farmer supply grassland ecosystem services

Grassland Index – measures ecosystem (ES) services through indicators and then a weighted combination or index of indicators is produced.

Verification – authentication of the ES services produced.

Registry - system that issues, tracks, transfers, and retires grassland units

Buyers – investors in grassland conservation who pay for and benefit from grassland ecosystem services.

What we measure

- Water Cycle

- Mineral Cycle

- Energy Flow

- Succession

Biodiversity Intactness Scale -Biodiversity is the variety of all living things that includes species diversity (animals, plants, insects, and microorganisms), ecosystem diversity (connections and interactions) and genetic diversity.

Rangeland Health - Rangeland health is an indicator of the condition of the grassland and includes assessments of soil stability, water, nutrient, and energy cycling and diversity of plant species.

Water Quality - Predicts the potential and importance of water quality variables such as phosphorus and nitrogen entering



► Water Supply - Measures wetland and riparian hydrology (estimate of wetland water storage volume). The water storage volume can be used to provide information on benefits such as flood mitigation and recreational opportunities.

► Soil Health - Soil health indicators are measurements of soil aggregate stability, bacteria to fungi ratio, a predicted abundance of soil microorganisms and soil organic matter.

Culture and People - Recreation and aesthetic views are important cultural ecosystem services. These are calculated based on naturalness of the landscape and use by recreational users (hunters, birdwatchers, etc.)

Existing Alberta Legislation

The Alberta Land Stewardship Act (2009) - Part 3 Division 1, provides legislation for conservation and stewardship tools. Section 23 specifically provides legislation regarding the development and use of market-based instruments.

Part 3 Division 2, provides legislation on conservation easements. This conservation tool has been heavily used by Government and conservation easement groups to promote conservation and stewardship.



Market-based instruments, however, have yet to be developed and used.

GCX considers a market-based approach to be one of the most effective additions to the tools available for conservation and stewardship. Out of the golden poplar shade

Into a grassy sunlit glade

Cowboy reigns his horse to blow

Sits and scans the slopes below

SKIMMERHORN WALTZ ALBUM BY CHARLIE EWING





Out of the golden poplar shade Into a grassy sunlit glade Cowboy reigns his horse to blow Sits and scans the slopes below

For Cattle

SKIMMERHORN WALTZ ALBUM BY CHARLIE EWING