

Ministry of Forests,
Lands and Natural
Resource Operations

Clayton Bradley
Range Branch



Range and Climate Change



Range and Climate Change

-  Overview
-  Resource Issues
-  Effects of Climate Change
-  Range Program Perspective on Climate Change Issues
-  Mitigation, Adaptation, Opportunities & Challenges
-  Recommendations

Climate Change

Chicken Little



Nelson



Overview

-  Long history of livestock grazing – circa 1860
-  94% of BC is provincial Crown land
-  Range is one of the original programs in BCFS
-  2,000 Range Act agreements
-  200,000 livestock on 30 M ha Crown range
-  Range Science is > 100 years old and BC has a proud history going back to Dr. Ed Tisdale

Resource Issues

-  Shrinking forage supply (ingrowth/encroachment)
-  Overstocked range and rangeland health
-  Invasive species
-  Water quality and riparian impacts
-  Impacts on habitats
-  Conflicts (recreation, wildlife and timber harvest)
-  Land claim settlements

Effects of Climate Change

-  Decrease in available soil water
-  Increase in extreme weather events
-  Models indicate wetter winters and increased evaporation

Land managers need to be flexible

-  Increased productivity, biodiversity, and ground cover in the understorey

OR

-  Increased invasive plants, displacing native plants

Range Program Perspective on Climate Change Issues

Less trees = more grass



Range Program Perspective on Climate Change Issues

Diversity of natural forests and rangelands = better adapted to disturbance and climate change



Vs.



Range Program Perspective on Climate Change Issues

Increasing soil carbon on degraded rangelands would offer the largest potential to sequester carbon



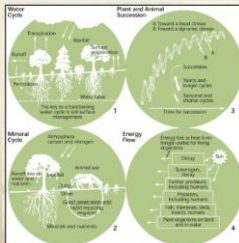
Range Program Perspective on Climate Change Issues

- Beef cattle methane emissions while on rangelands are 0.4% of BC's total GHG emissions and can be reduced



Range Program Perspective on Climate Change Issues

- Sound range management benefits everyone



Mitigation – Carbon Sequestration

- Carbon sequestration in grasslands compares favourably with conifer forests and is perpetual
- Most of a grass plant is below ground and is not susceptible to catastrophic fire



- Healthy deep-rooted grassland communities sequester more carbon than shallow-rooted early-seral communities

Mitigation – Reduces GHGs

- CH₄ emissions from domestic livestock can be reduced with high quality forage, mineral supplementation, and good herd health



<http://farmartistic.com/media/photo-gallery/beef-cattle-photos/>

- CO₂ emissions can be reduced by local finishing (the 100 mile rule)



<http://katsplantsandpeople.blogspot.ca/2012/04/100-mile-diet.html>

Adaptation — Management Implications

- Warmer and drier BEC zones will shift northward and to higher elevations
- Apply management practices that can promote resilient ecosystems and accommodate gradual changes in growing conditions
- Restoring fire-maintained ecosystems
- Educating range tenure holders and the public to use ecosystem services more conservatively and efficiently

Opportunities

- Increased forage and improved ecosystem health
- Increased agricultural production and expansion of the livestock industry
- Finishing livestock locally and reducing CO₂ emissions
- Improve monitoring for new invasive species and quickly respond to limit establishment and spread

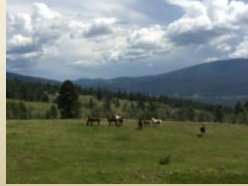


<http://www.miva.com/blog/are-abandoning-shoppers-your-un tapped-opportunity>

Challenges

 Balancing multiple uses on the land base and managing conflicts:

- Timber harvest
- Water quality and quantity
- Forage supply
- Feral horses and unregulated wild ungulate populations



Recommendations



Consistent policy

- Changing demographics, societal values and consumer preferences
- Changes in the beef cattle industry
- Understorey values including botanical forest products
- Forestry stocking standards that encourage a healthy productive understorey
- Longer periods of rest from grazing
- Rethink penalties for range non-use, unused grass is not wasted
- Provide incentives for conservative management

Recommendations



Changes to best management practices

- Distribution
- Use
- Rest/Recovery
- Time

Other commonly used practices and tools that complement these cornerstones of range management

Recommendations



Monitoring and potential indicators

- Plant species composition changes in reference areas
- An increase in C₄ grass species
- Plantation failures due to drought and pests
- Shifting plant community boundaries
- Expansion of invasive species ranges and new invasives
- Amphibians and warbler species (in aspen forest)
- Insects, in particular some butterfly species
- Changes in wetland communities (character, number, area and functionality) and streams
- New livestock pests or diseases

Chill out -- there is nothing new under the sun



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Questions & Discussion
