Sustainable Canadian Agricultural Partnership

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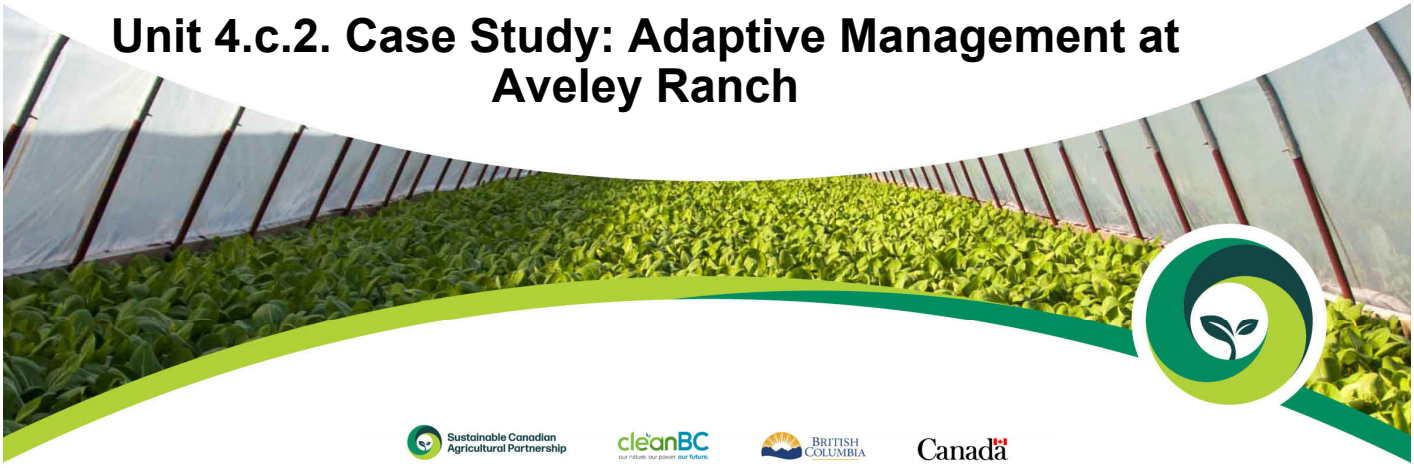
Silvopasture In British Columbia Information Series

Unit 4.c.2. Case Study: Adaptive Management at Aveley Ranch



Acknowledgments

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Photos in this presentation are courtesy of Aveley Ranch and Unsplash.

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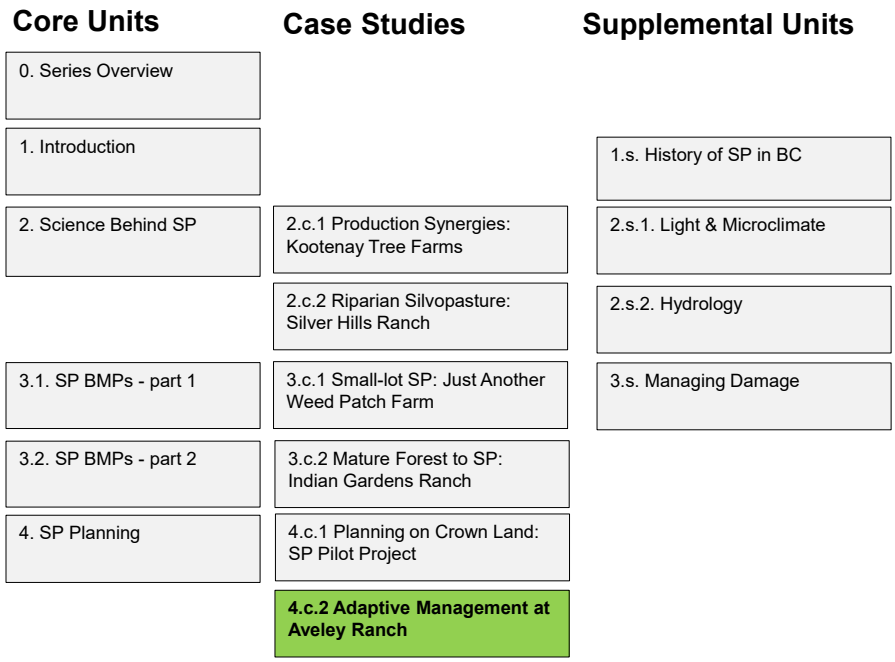
Silvopasture in BC Information Series Content Guide



This silvopasture case study is meant to reinforce information provided in the third and fourth units of the Silvopasture in BC Information Series:

- Silvopasture beneficial management practices; and,
- Silvopasture planning.

Unit 4.c.2. Case Study: Adaptive Management at Aveley Ranch

Goal

Gain a deeper understanding of silvopasture planning, implementation and management through British Columbia case studies.

Prerequisites

Units 3. Beneficial Management Practices, and 4. Planning Silvopasture.

Content

Adaptive planning methods: Aveley Ranch.

In this unit we'll look at an example of silvopasture use in BC to gain a better understanding of the planning, implementation and management considerations.

Prior to commencing this module, you should have completed core units 3 and 4 in this information series.

This case study will cover an adaptive management approach to silvopasture implementation used at Aveley Ranch.

Adaptive Management

Planning in Complex Systems

- Silvopasture can combine complexity with limited local research and information.
- Errors can have long-term impacts in long-lived systems.
- Challenges addressed with adaptive management approach.

One of the challenges to successfully implementing silvopasture is overcoming the added management complexity these systems can have relative to conventional pasture or range management. This is coupled with a growing but limited base of local research and information available to producers and land managers.

As very long-term production systems, silvopasture have added risks to management errors. In annual production systems, replanting occurs every year. In perennial production systems, establishment costs can be much higher, and set-backs can delay maturation by multiple years, if not decades.

These silvopasture planning challenges related to complexity, information availability, and time, however, are not insurmountable. They just require a more responsive and flexible approach to planning and implementing. One method is by adopting an adaptive management approach.

Adaptive Management

Adaptive Management

- Structured ‘trial and error’ in the face of uncertainty.
- Changing assumptions and interventions based on new information gained through experience.
- Allows you to adapt and respond to changing markets, regulations and climate.

Adaptive management is a structured, iterative process (‘trial and error’) for decision making in the face of uncertainty. It has the goal of reducing the uncertainty over time by system monitoring and timely interventions.

Rather than rigidly following with the original system design, an adaptive management system involves actively collecting information, ~~and~~ changing the assumptions and taking interventions to respond to new or different information gained through the monitoring.

An adaptive management approach also provides you with the ability to adapt and respond to changing circumstances that manifest over the lifespan of the silvopasture which can challenge your original planning assumptions, including changing markets, new regulations and climate change.

Silvopasture in Diverse Production

Aveley Ranch

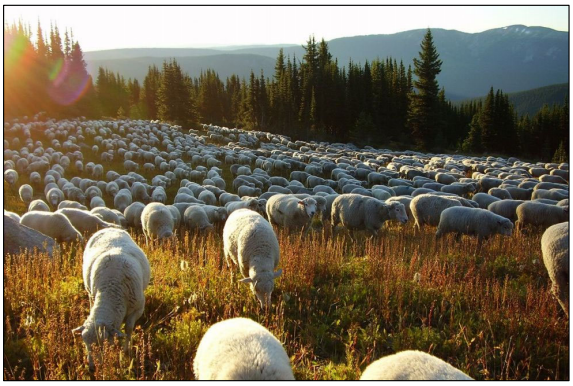
- Multi-generational sheep farm homesteaded in 1906.
- Up to 1300 Corriedale ewes.

Aveley Ranch is a family owned and operated, multi-generational sheep farm, first homesteaded by the Moilliets in 1906. The ranch is located in the North Thompson River valley, near Clearwater.

Aveley has been producing the dual purpose Corriedale sheep breed since the 1920s, with a flock of up to 1300 ewes together with a small beef herd.

Silvopasture in Diverse Production

Aveley Ranch



- Forested and alpine Crown range.
- Private range, pasture and silvopastures.

The Ranch deploys a rotational grazing system, with seasonal movement of the flock utilizing Crown range permits to graze mid- and high-elevation forestland and alpine areas, in addition to range, pastures and silvopastures on their private land base.

Silvopasture in Diverse Production

Aveley Ranch

- Woodlot licence on land adjacent to Crown range.

The ranch has also diversified its operations with timber production. Trees are managed in a woodlot license spanning an area of the private land base and Crown land in an area adjacent to their range license.

Forest and grazing resources are fully integrated and management of silvopastures are used as one of the tools on the Ranch to maintain its diverse production.

Silvopasture For Diverse Production

Generations of Silvopasture Experience

- Started converting forests into silvopastures in the early 20th century.
- Continues to develop new silvopastures on private land.

Aveley Ranch has some of the oldest documented, continuously operated silvopastures in British Columbia. The ranch started clearing land in the 1910s through 1920s with thinning and retention of mature tree cover on some pastures.

Aveley continues to develop and renew the silvopastures on its private land base to this day. In recent years the Ranch has been motivated by a shift away from using Crown rangelands where increasing costs, predation and a lack of shepherds hinder use. Resource road deactivations and some types of forestry activities such as stumping for root rot management have also made the process of using of their forested Crown range less viable.

Silvopasture For Diverse Production

Generations of Silvopasture Experience

- Forest cutblock vegetation management with sheep in the 1980s and 1990s.

On its Crown range, the Ranch has had extensive experience in integrated timber-range management, including transient grazing use of regenerating cut-blocks. And for a time in the 1980s and 1990s, it contracted as a vegetation management service to BC Timber Sales and various timber licensees, primarily for clearing fireweed and other vegetation from timber-harvested areas prior to replanting the next tree crop.

Silvopasture For Diverse Production

Silvopastures Help Meet Multiple Goals

- Create incremental forage with improved tree quality.
- Shelterwood management with pruning 3-m up the tree .
- Higher quality, seasonal grazing opportunities and shade benefits flock welfare.
- Works with the natural potential and flow of the land.

Incorporating silvopastures together with conventional pasture and rangeland at Aveley, helps to meet its diverse production goals with a benefit to both forage and tree production.

On the ranch's silvopastures, selective logging, using a shelterwood management system, is used to retain mature tree cover with a minimum 3-m spacing between individual tree clusters. The lower limbs of the trees are also pruned from the Douglas-fir and lodgepole pine to a height of 3-m. In this area of the North Thompson, this provides adequate light to support a robust understory of forage. It also improves the value of the timber.

Indeed, the silvopastures can produce a better volume and quality of forage than pastures during a drought or hot year. And the tree cover brings a measure of added animal comfort with the addition of shade.

Also important to the ranch is that the silvopastures they use work with the natural potential and flow of the land, not against it. The forest sites when cleared to pasture, tend to regenerate back to forest cover over time. Silvopastoral management shapes that natural potential to produce beef, lamb and timber at Aveley Ranch, with lower costs and fewer management inputs over the long-term.

Adaptive Silvopasture

Lessons Learned at Aveley: Monitoring

- Continuous monitoring and evaluation for better data-driven decisions.
- Monitoring use:
  - See trends.
  - Proactive maintenance.
  - Find efficiencies.

Adaptive management relies on continuous monitoring and evaluation, to make good, data-driven adjustments to your plans.

Aveley tailors its grazing and forest management to each of the specific locations within which it operates. Monitoring allows the ranch to see patterns and trends in these units and across the whole operation.

Not every farm and ranch in BC has the benefit of over a century of lessons learned in operating various iterations of silvopastures. But large or small, new or well established, everyone can benefit over time by diligently documenting the successes and challenges you have experienced. Pairing this with keeping up to date on new research and information, will be the foundation to adapting your silvopasture plan.

Monitoring also allows you to proactively shift your plans as you see new conditions developing, through scheduling maintenance or periods of rest in your silvopastures and other paddocks.

Aveley also uses data collection to adjust its labour plans and find efficiencies. For example, the Ranch has found that it can employ shepherds for thinning and pruning work on the trees when they are not actively tending the sheep.

Adaptive Silvopasture

Lessons Learned at Aveley: Scale

- Creating and maintaining silvopastures requires time and resources
- If ungrazed after treatment, they will revert to closed forests.
- Only convert as much ground into silvopasture as you can graze.

The low elevation silvopastures at Aveley Ranch have been harvested and brushed three times over the past century. At each treatment, the time and resources expended to harvest trees, thin and slash non-merchantable timber, and prune and chip lower limbs has been considerable.

If these silvopasture areas are not grazed soon after treatment, particularly for deciduous stands, suckering and brush ingress can revert the stand back to a closed forest within a few years. Fortunately, sheep thrive on deciduous regrowth, eating leaves and small stems. Their brushing work keeps the understory clear until the forage stands are better established to suppress new woody growth. And this comes with the added benefit of improved flock health from the addition of the natural tannins found in the tree and shrub leaves.

Adapting to this natural regeneration response has led Aveley Ranch to only convert as much land into silvopasture as the herd can graze. The post- treatment grazing is an important component to the long-term success of the silvopasture.

Adaptive Silvopasture

Lessons Learned at Aveley: Fencing

- Need adequate fencing in place.
- Consider adjacent pastures and resting locations for sheep.

Another adaptation the Ranch has employed has been a shift to using electric fencing versus shepherding animals. Labour costs and availability are restricting the traditional role of shepherds in BC sheep farming.

Having adequate fencing ensures grazing utilization targets can be met and also helps manage animal movements into and out of the silvopasture. Silvopasture paddocks can be both an attractant for animals seeking lush forage and shade in the summer, or a detractant at times, because the sheep don't like to be confined on silvopastures with more than 50% forest cover.

Where predators have been active, it is also important to consider the adjacent spaces that can be utilized for night-time confinement of animals and resting areas away from the forest cover that can conceal predators.

Adaptive Silvopasture

Lessons Learned at Aveley: Fencing

- Additional costs and maintenance with electric fences in silvopastures.

Experience with electric fencing has also adapted how they are deployed and maintained. Where a single stand electric fence can generally manage cattle movements, two strands are needed for sheep. And electric fencing used in silvopastures may need additional grounding points relative to open pastures, with some added scouting and maintenance where low branches or shrubs may come into contact with the fence and discharge the wire.

Adaptive Silvopasture

Lessons Learned at Aveley: Water

- Water always needed for quality lamb and wool production.
- Water the biggest cost and most important factor in livestock distribution.
- Silvopastures help to conserve water supplies and reduce heat stress and water demand.

Having an adequate water supply is foundational to all agriculture, and lamb and wool quantity and quality are both directly linked to having a steady supply of clean stock water.

Aveley has found that water is the biggest cost and most important factor influencing their livestock distribution. Silvopastures need to have their own reliable water supply developed, or animals are forced to trail significant distances multiple times per day to drink. This has become even more acute in recent years with climate change and shifts in surface water availability.

The Ranch has also experienced a positive influence on water supplies from having silvopastures in their production mix. Silvopastures help to conserve water supplies, reducing evaporation losses in the summer or during drought. The shade and cooler temperatures under the tree cover of the silvopastures also help to reduce heat stress and water demand by the flock.

Together, the added water storage and reduced water demand combine to incrementally improve the water balance at Aveley.

Questions and Discussion

Questions and discussion on the case study.