

Silvopasture Case Studies - Producer Perspectives

Indian Gardens Ranch, Savona BC

June 2024

Silvopasture is an agroforestry system which purposefully blends the management of livestock, forages and trees on the same site – allowing interactions among these components to be optimized throughout the production cycle.

INTRODUCTION

Silvopastures can be created in timbered systems at any stage of the rotation from planting through to modification of mature stands. They can also be created by introducing trees into pasture systems. In B.C., silvopasture practices are typically adopted as a supplementary or complementary approach to conventional forestry, range, or pasture management. Components are combined through careful planning, and implementation of management practices considering each of the elements and their potential interactions. By leveraging the advantages of integration, these systems can yield a variety of benefits, including production gains, economic and social benefits, enhanced environmental function (e.g. conservation of soil, water, air, and biodiversity) and climate change mitigation and adaptation benefits.

by Dave Haywood-Farmer

This case study is part of a series representing producer experiences with planning, implementing, and managing silvopasture as part of their operations.

OUTLINE OF THE OPERATION AND CONTEXT

Indian Gardens Ranch is located west of Kamloops, near Savona, B.C. and has been owned and managed by the Haywood-Farmer family for close to a century.

The ranch is a commercial cow-calf operation, which relies on a mixture of tenures including private land, Crown grazing leases, and Crown grazing licences, spanning many different ecosystem types from open grasslands at low-elevation, to open Douglas-fir stands and into higher-elevation spruce to operate.

- The private land on the ranch is used primarily for pasture, feeding grounds, and growing feed for cattle.
- The grazing leases are managed with an objective of providing essential spring and fall grazing. They span the low-mid elevation areas on the ranch (300 meters -1,000 meters).
- The grazing licences, which are typically at higher elevation, provide summer range for cattle and span 800-1,500 meters elevation.

The majority of the silvopasture work was conducted within grazing leases, at mid elevation on the ranch (~800 meters). These sites had seen a marked increase in timber density over the past half century due to not having been logged, a fire deficit, and ingress. On these sites, the timber density was having a significant impact on the production of forage, with timber outcompeting grasses and forbs for nutrients, water and light at the site level and reducing plant diversity and abundance.

As a ranch that relies on forage quality and abundance, diminished forage values have significant impacts on the economics of the operation. The need to support forage values was the main reason that Indian Gardens Ranch became interested in conducting a silvopasture pilot.

LOCATION AND SITE DESCRIPTION

Figures 1 through 5 identify pilot site locations, and provide visuals of untreated and treated stands showing the the silvopasture blocks immediately after harvest and currently.

Figure 6 provides a summary of site characteristics prior to treatment (harvest).



Figure 1: Indian Gardens Ranch Silvopasture Project and Ranch layout



Figure 2: Silvopasture blocks



Figure 3: Example untreated forest stand



Figure 4: Harvest treatment at establishment of one of the silvopasture sites approximately 10-12 years ago



Figure 5: Silvopasture site June 2024 – note the skid trail and forage in the understory

Site description
<p>Biogeoclimatic Zone:</p> <ul style="list-style-type: none"> Interior Douglas-fir (IDF)
<p>Stand Type:</p> <ul style="list-style-type: none"> Mature, mixed coniferous Elevation range of 700-900 meters
<p>Characteristics of site prior to manipulation:</p> <ul style="list-style-type: none"> Primarily moderate slopes of 0-20% Soil type variable
<p>Understory (before harvested):</p> <ul style="list-style-type: none"> Prior to timber harvest, the understory was severely ingrown in places, impacting forage quality and abundance

Figure 6: Summary of site characteristics prior to treatment.

OBJECTIVES

- Creating forage values while supporting timber production.
 - These pilots targeted an increase in forage production across the pilot sites. These had both ecological and economic benefits for the ranch.
- Maintaining and enhancing ecosystem values.
 - Indian Gardens Ranch supports important wildlife and habitat values, including important mule deer range. Restoring the open-stand nature of the Douglas-fir stand improves habitat conditions.
- Maintaining sufficient debris site levels for biodiversity and soil production.
- Improved landscape resilience to wildfire.
 - While not an explicit objective at the time, it has become evident that this type of landscape treatment was a useful way to reduce accumulated fuels on the landscape and support landscape resilience to wildfire. In this case, the site areas are relatively close to the ranch yards, which create additional fire-proofing benefit.

TREATMENTS/MANAGEMENT AND TIMELINES

An assessment of the current condition of the resource is necessary to plan silvopasture. This may include a combination of reconnaissance, timber cruise, stocking survey, mapping, and the use of existing reference materials like soils reports. In this case, a reconnaissance and timber cruise were conducted to establish site conditions and estimate both the total volume of merchantable timber and the distribution of tree diameter classes.

Harvest

- The ranch conducted several different pilots over the course of a few years, beginning around 2009, which experimented with different harvesting methods. These included:
 - Hand falling, grapple skidder, hand buck and loading with an excavator (Figure 2, blocks 1 and 2).
 - Logging with a buncher, grapple skidder, processor, log loader and excavator (Figure 2, blocks 3, 4 and 5).
- In both cases, a mixture of ages of timber were selected, leaving behind a very natural mixed-age stand.
- Selective harvest helped to create a balance between light and moisture – enabling sufficient filtered light to grow desirable forage but allowing enough moisture retention to maintain soil moisture.

Site Prep

- In both cases, a dryland forage mix was hand-seeded immediately following harvest to minimize the spread of invasive plants and support the re-establishment of desirable forage species.

Planting

- There was no tree planting conducted on these sites; the idea being that natural forest succession would likely afford another harvest within 30 years.

Livestock Use – grazing management

- Grazing resumed immediately following the site treatment.

CURRENT STATUS AND MANAGEMENT

- The pilot sites continue to be among the best examples of maximizing grazing, future timber for harvesting and overall habitat values on the ranch. These sites are integrated into our grazing rotation and are grazed in either the spring or the fall on alternate years to best manage the forage resource.

There has been very little deadfall in the remaining trees; with stands showing all signs of health and resilience.
- Unplanned for or unanticipated benefits.
 - There continues to be significant wildlife usage, particularly by ungulates but also cougar, bobcat and lynx.
 - The aesthetic of the selectively harvested open stand landscape is very appealing.
 - Landscape resilience to wildfire and reduction in fire hazard.

LESSONS LEARNED AND FINAL THOUGHTS

- The silvopasture project was very successful on our ranch and provides significant forage enhancement as well as numerous other benefits.
- It is our view that the choice to select for a mixed-age stand through logging is good from the perspective of forest succession, future mid-term timber harvest as well as wildlife habitat.
- With a clear need to remove fuel from much of the landscape, especially in the Wildland Urban Interface to reduce fuel hazard and support landscape resilience, this type of project offers valuable co-benefits.
- Indian Gardens Ranch would be eager to do additional similar silvopasture projects in the future.

Opinions expressed in this document are those of the author and not necessarily those of the governments of Canada and British Columbia. The governments of Canada and British Columbia, and their directors, agents, employees, or contractors will not be liable for any claims, damages, or losses of any kind whatsoever arising out of the use of, or reliance upon, this information.