RED DOT RANCH
CONSULTING

Wycliffe Conservation Complex Post-Treatment Forest Stand Monitoring
November 2024

Completed by:
Red Dot Ranch Consulting

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Background

Red Dot Ranch Consulting was contracted by The Nature Conservancy of Canada (NCC) in fall 2024 to assess and record data on forest stands that have been treated with ecological restoration treatments as a part of the Wycliffe Conservation Complex (WCC). Units assessed are on parcels managed by NCC, The Nature Trust of BC (NTBC), or the BC Ministry of Water, Land, and Resource Stewardship (MWLRS). The treatments took place between 2020 and 2023. Pre-stand data was pulled from the treatment prescriptions where the pre-treatment stand composition was recorded. Post-treatment data was collected by completing a combination of walking transects and 5.64m radius plots. Plot frequency and density varied between units based on size and stand continuity. For some of the treatment areas, pre-treatment data was generalized over a larger area and accuracy to the sample plots is unknown.

Red Dot Ranch completed their field work in October and November 2024, and submitted this data to the WCC Partners.

Results

The results have been summarized by unit in the following sections. The pre and post-treatment data is outlined, along with the percent change in stand density by tree layer. Also included are field observations, potential future maintenance treatments, and suggested future monitoring.

The units are listed based on the date that the thinning treatments were completed.

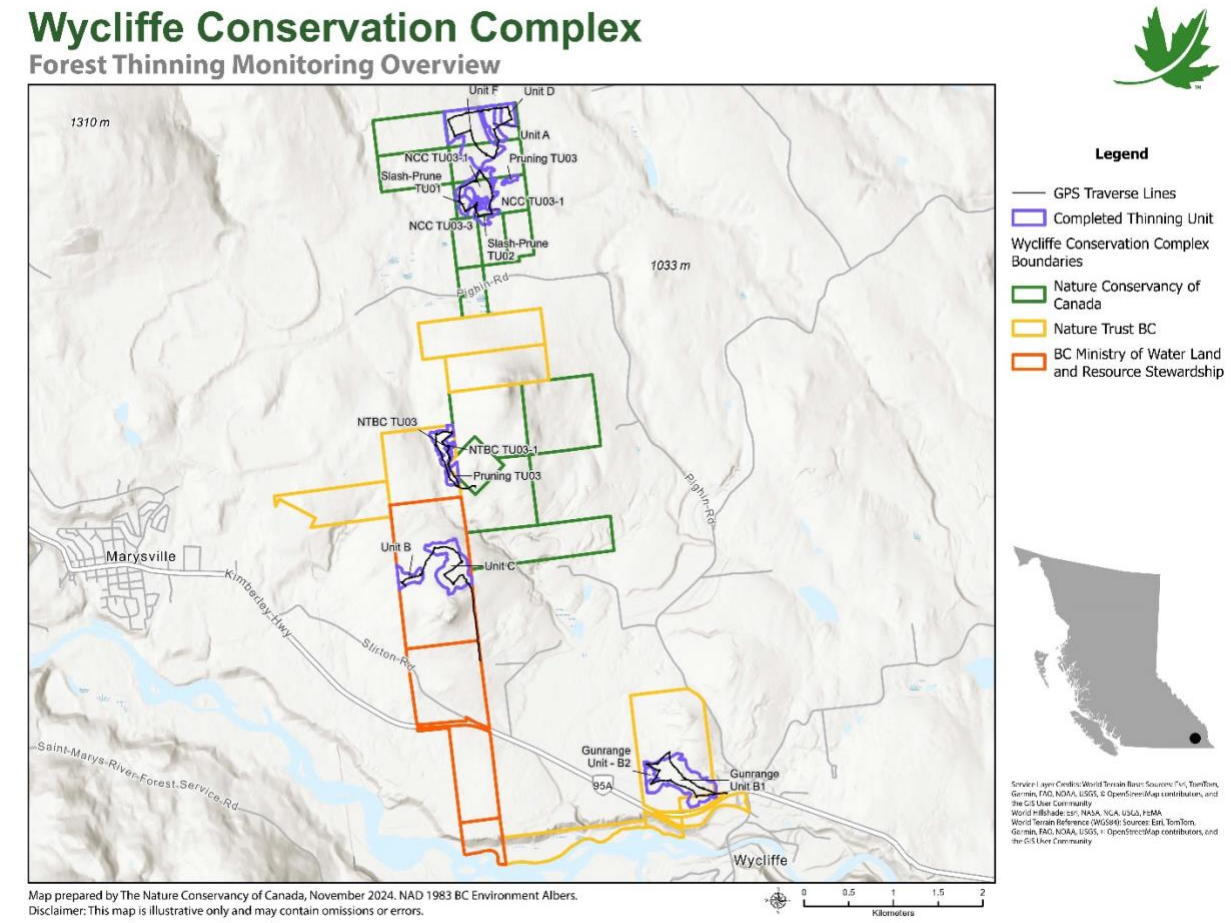

Figure 1: Overview map showing the lands included in the Wycliffe Conservation Complex, along with the GPS traverse lines walked and the sampled units identified.

The Nature Trust of British Columbia

Unit B, Gunrange - (27.5 Ha, Figure 2)

Post-Treatment Monitoring (10 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	530	0	0	0	0	0	530
2	230	0	0	0	0	0	230
3	352	11	0	0	7	0	363
4	20	0	0	0	10	0	30
Totals	**1132**	**11**	**0**	**0**	**17**	**0**	**1153**

	Post 2021-2022 Treatment Data							
	Tree Species						Total Stems/Ha	Changes in Stand Density (%)
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	400	0	0	0	10	0	410	**-23**
2	90	0	0	0	0	0	90	**-61**
3	0	0	0	0	0	0	0	**-100**
4	200	50	0	0	0	0	250	**733**
Totals	**690**	**50**	**0**	**0**	**10**	**0**	**750**	

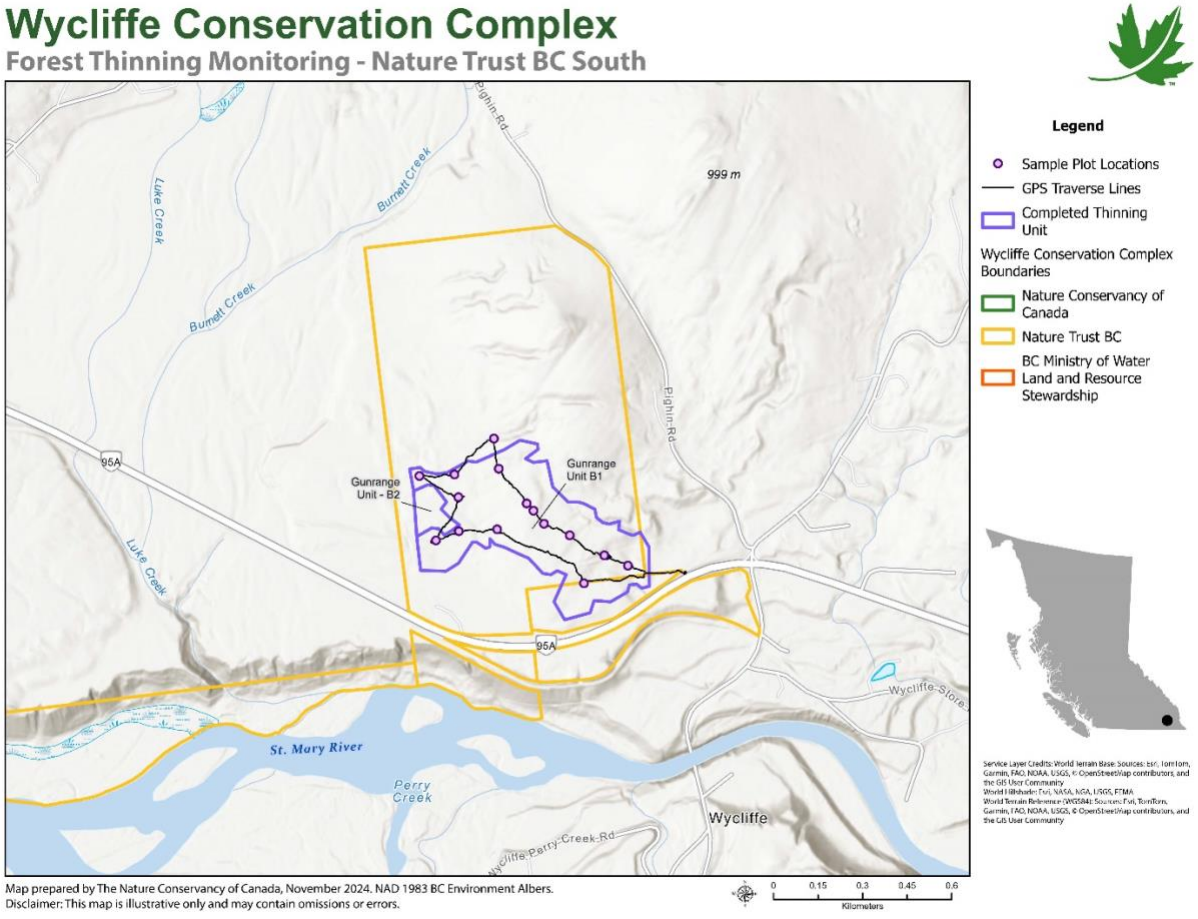

Figure 2: Map showing NTBC Gun Range parcel, with thinning unit monitored, GPS traverse line, and sample plot locations.

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Stocking still high for 'Open forest', however, distribution is patchy and beetle acitivity will continue to reduce layer 1 & 2 conifers. Even though layer 4 stems data suggests significant ingress, these were likely germinants at the time of treatment. Overall conifer ingress to date has been minimal.
2. Pruning slash not removed from underneath tree dripline (reduces fire resistance)
3. A few unburned slash piles from treatment
4. Small patches (<0.1 ha) of immature aspen
5. Heavy browse on saskatoon
6. Bluebunch Wheatgrass - older 'bunches' being choked out from litter accumulations (lack of fire-see photos)
7. Small pockets of Py insect mortality (suspected woodborers)

Potential Future Maintenance Treatments:

1. Prescribed Burning. Scatter pruning slash from underneath Layer 1 & 2 stems to increase fire resistance. Expect some mortality on layer 1 & 2 stems. Burning will be beneficial to forage & browse health
2. Slashing to remove conifer ingress over time if prescribed fire not implemented

Suggested Future Monitoring:

1. Allow an additional 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known Invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

Nature Conservancy of Canada

Luke Creek, Unit A (4.56 Ha, see Figure 3)

Post-Treatment Monitoring (2 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	148	242	0	0	0	0	390
2	31	149	0	0	0	0	180
3	0	390	0	0	0	0	390
4	0	30	0	0	0	0	30
Totals	**179**	**811**	**0**	**0**	**0**	**0**	**990**

	Post 2021-2022 Treatment Data							
	Tree Species						Total Stems/Ha	Changes in Stand Density (%)
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	50	50	200	0	0	0	300	**-23**
2	0	50	100	0	0	0	150	**-17**
3	0	100	50	0	0	0	150	**-62**
4	0	150	0	0	0	0	150	**400**
Totals	**50**	**350**	**350**	**0**	**0**	**0**	**750**	

Observations:

1. Layer 3 conifers have been significantly reduced. Stocking still slightly high for 'Open Forest', however, distribution is patchy and mortality from beetle activity that is dispersed throughout the Wycliffe Conservation Complex will likely continue to reduce layer 1 & 2 stems. Even though layer 4 stem data suggests significant ingress, these were likely germinants at the time of treatment. Overall, conifer ingress to date has been minimal.
2. Some Lw snags have been created within this unit
3. Saskatoon is main browse species with heavy browse. Forage species mainly pinegrass with dispersed bunchgrasses in openings.

Potential Maintenance Treatments:

1. This Unit & Unit 'D' likely too small / isolated to be included in a logical prescribed burn unit. Maintain at higher end of 'Open Forest' stocking standards to provide some forage & browse in proximity to established reserves (thermal & hiding cover).
2. Slashing to reduce conifer ingress over time

Suggested Future Monitoring:

1. Allow an additional 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Monitor mortality from beetle activity that is dispersed throughout the Wycliffe Conservation area. Walk-through assessments should be sufficient to determine future actions.

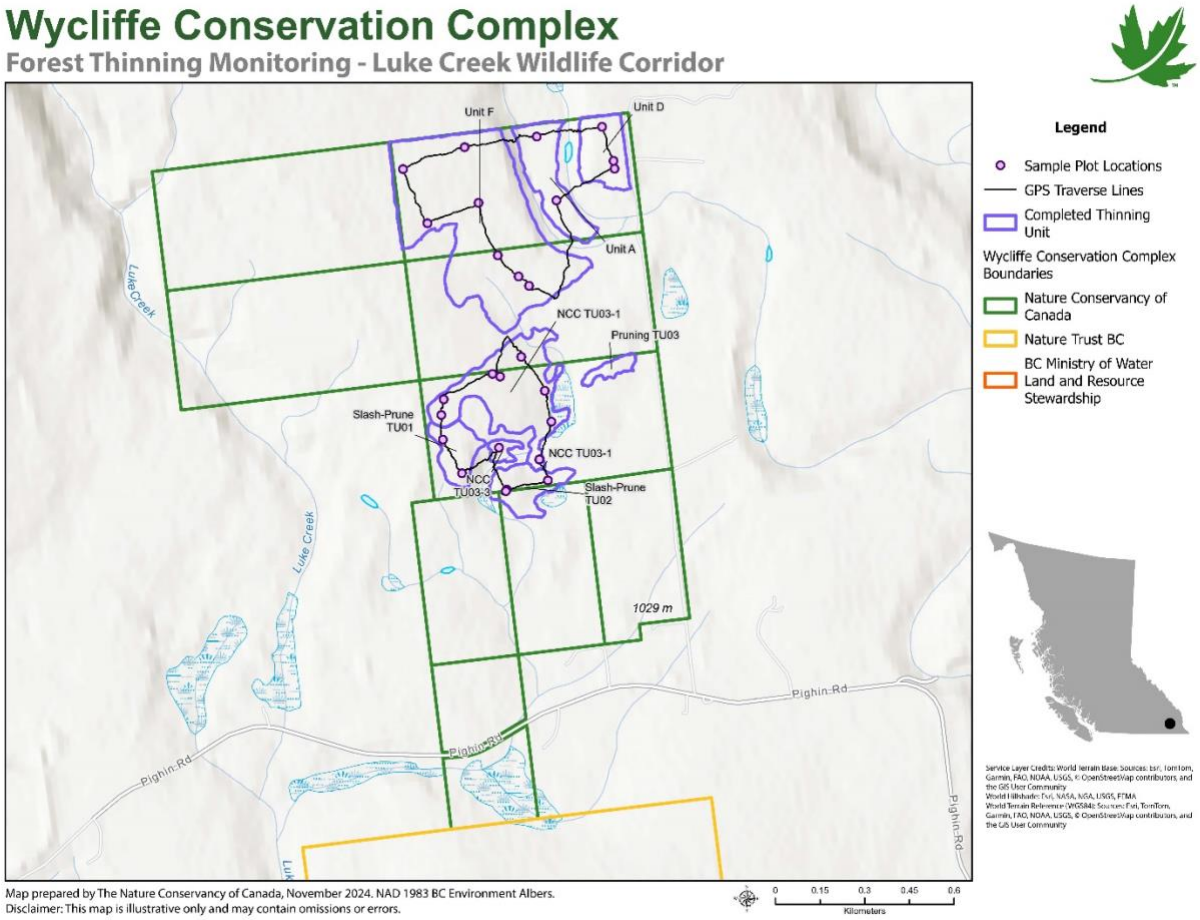

Figure 3: Map showing NCC's Luke Creek Wildlife Corridor Conservation Area, where six treatment units were completed since 2021. The map shows the completed treatment units, the GPS traverse lines, and the sample plot locations.

Nature Conservancy of Canada

Luke Creek, Unit D (3.55 Ha, see Figure 3)

Post-Treatment Monitoring (2 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	350	0	0	0	0	0	350
2	100	0	0	0	0	0	100
3	78	24	0	0	0	498	600
4	0	0	0	0	0	0	0
Totals	**528**	**24**	**0**	**0**	**0**	**498**	**1050**

	Post 2021-2022 Treatment Data							
	Tree Species						Total Stems/Ha	Changes in Stand Density (%)
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	50	250	100	0	0	0	400	**14**
2	0	0	0	0	0	0	0	**-100**
3	0	0	0	0	0	0	0	**-100**
4	0	200	0	0	0	0	200	**100**
Totals	**50**	**450**	**100**	**0**	**0**	**0**	**600**	

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Stocking is at the high end for 'Open Forest', however, distribution is patchy and mortality from beetle activity that is dispersed throughout the Wycliffe Conservation Complex will continue to reduce layer 1 & 2 stems . Even though layer 4 stem data suggests significant ingress, these were likely germinants at the time of treatment. Overall, conifer ingress to date has been minimal.
2. Saskatoon is main browse species with heavy browse. Ground cover of native bunchgrasses well established in open areas, heavy to pinegrass in denser conifer patches.
3. Some small dense clumps of layer 3 immature aspen outside plots

Potential Maintenance Treatments:

1. This Unit & Unit 'A' likely too small / isolated to be included in a logical prescribed burn unit. Maintain at higher end of 'Open Forest' stocking standards to provide some forage & browse in proximity to established reserves (thermal & hiding cover).
2. Slashing to reduce conifer ingress over time .

Suggested Future Monitoring:

1. Allow an additional 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Monitor mortality from beetle activity that is dispersed throughout the Wycliffe Conservation area. Walk-through assessments should be sufficient to determine future actions.

Nature Conservancy of Canada

Luke Creek, Unit F (24.15 Ha, see Figure 3)

Post-Treatment Monitoring (6 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	968	35	0	0	0	177	1180
2	100	0	0	0	0	100	200
3	161	0	0	0	0	79	240
4	40	0	0	0	0	0	40
Totals	**1269**	**35**	**0**	**0**	**0**	**356**	**1660**

	Post 2021-2022 Treatment Data							
	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	567	83	0	0	0	100	750	**-36**
2	100	50	17	0	0	33	200	**0**
3	0	50	0	0	0	17	67	**-72**
4	33	67	0	0	0	0	100	**150**
Totals	**700**	**250**	**17**	**0**	**0**	**150**	**1117**	

Observations:

1. Layer 3 conifers have been significantly reduced. Stocking still high for 'Open Forest', however, beetle activity will continue to reduce layer 1 & 2 conifers. Even though layer 4 stem data may suggest significant ingress, most of these were likely germinants at the time of treatment. Overall, conifer ingress to date has been minimal.
2. Scattered clumps and individual immature aspen
3. Heavy browse on saskatoon & some layer 4 Fd
4. Forage species a mix of pinegrass and bunchgrasses
5. Small pockets of Py insect mortality (suspected woodborers)
6. A few small (<0.1 ha) areas untreated in SW corner of unit (adjacent to Plot #1 - not ribboned)

Potential Maintenance Treatments:

1. Prescribed Burning. Expect some mortality on layer 1 & 2 stems. Smaller area, combine with other adjacent areas, if practical, to make a logical burn unit.
2. Slashing to reduce conifer ingress if prescribed burning not implemented

3. Girdling / Topping / Inoculation of some Layer 1 Py stems to create snags

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known Invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

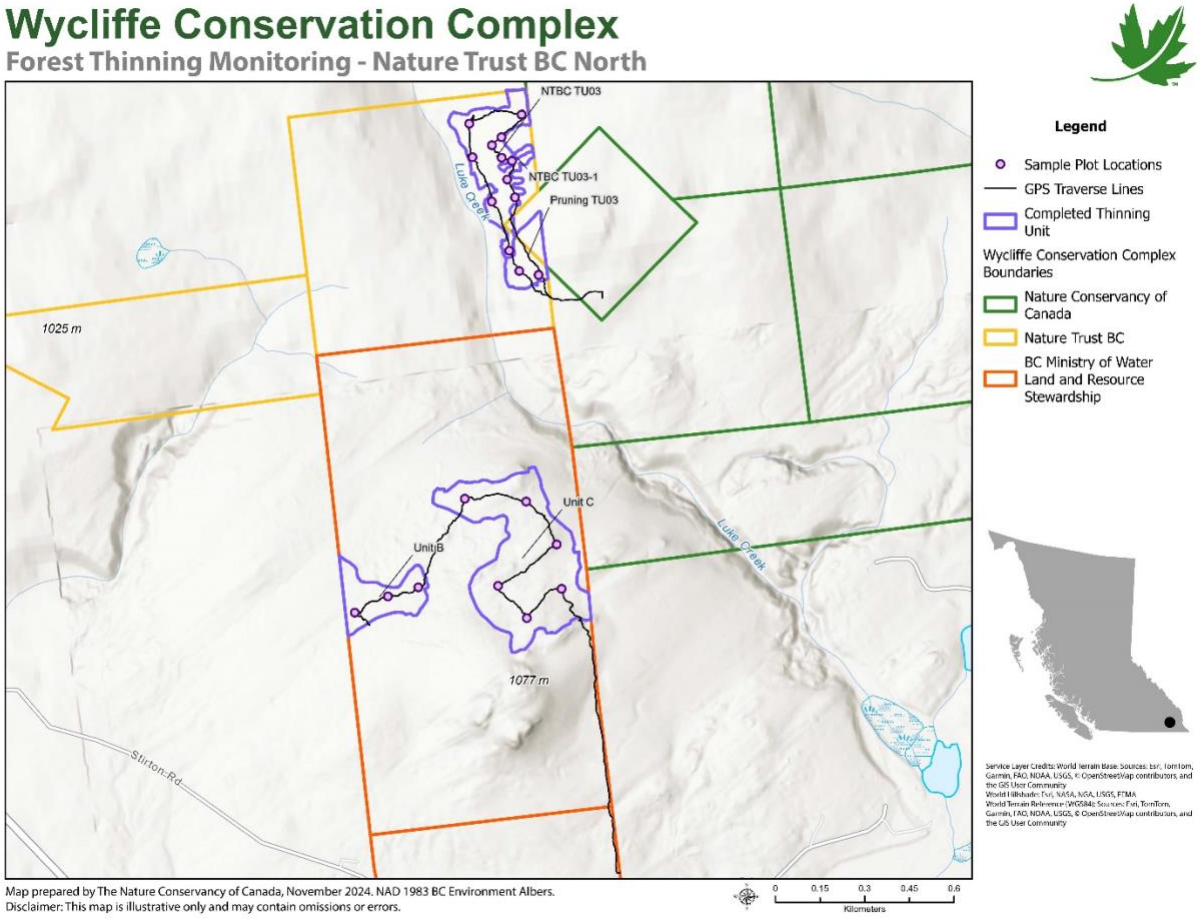

Figure 4: Map showing NTBC and MWLRS parcels with completed thinning units, GPS traverse lines, and sample plot locations.

B.C. Ministry of Water, Lands & Resource Stewardship

Butte Unit B (3.77 Ha, see Figure 4)

Post-Treatment Monitoring (3 Plots established)

Pre Treatment Data

Tree Layers	Tree Species Stems/Ha						Total Stems/Ha
	Py	Fd	Lw	Se	Pl	At	
1	553	98	49	0	0	0	700
2	348	152	300	0	0	0	800
3	451	451	154	0	0	44	1100
4	0	0	0	0	0	0	0
Totals	**1352**	**701**	**503**	**0**	**0**	**44**	**2600**

Post 2021-2022 Treatment Data

Tree Layers	Tree Species						Total Stems/Ha	Changes in Stand Density (%)
	Py	Fd	Lw	Se	Pl	At		
1	67	67	300	0	0	0	434	**-38**
2	0	33	0	0	0	0	33	**-96**
3	0	67	0	0	0	0	67	**-94**
4	0	200	0	0	0	0	200	**100**
Totals	**67**	**367**	**300**	**0**	**0**	**0**	**734**	

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Stocking still high for 'Open Forest', however, distribution is patchy and beetle activity (and potentially DRA) will continue to reduce Layer 1 & 2 conifers. Conifer ingress to date has been minimal (only noted in east portion of the unit).
2. Pruning slash not removed from underneath tree dripline (reduces fire resistance)
3. Small patches of immature layer 3 aspen outside plots
4. Ground cover of native bunchgrasses well established. Minimal browse species.
5. Small pockets of Py insect mortality (suspected woodborers)

Potential Maintenance Treatments:

1. Prescribed Burning. Scatter pruning slash from underneath Layer 1 & 2 stems to increase fire resistance. Expect some mortality on layer 1 & 2 stems. Small area would have to be combined with other areas to make a logical burn unit.
2. Slashing to remove conifer ingress over time if prescribed fire not implemented.
3. Girdling / Topping / Inoculation of some Layer 1 Py stems to create snags.

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known Invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

B.C. Ministry of Water, Lands & Resource Stewardship

Butte Unit C (16.1 Ha, see Figure 4)

Post-Treatment Monitoring (6 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	197	342	41	0	0	0	580
2	62	398	20	0	0	0	480
3	179	918	0	0	0	23	1120
4	0	0	0	0	0	0	0
Totals	**438**	**1658**	**61**	**0**	**0**	**23**	**2180**

	Post 2021-2022 Treatment Data							
	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	117	217	33	0	0	0	367	**-37**
2	33	117	0	0	0	0	150	**-69**
3	0	100	0	0	0	0	100	**-91**
4	0	150	0	0	0	0	150	**100**
Totals	**150**	**584**	**33**	**0**	**0**	**0**	**767**	

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Distribution is patchy and beetle activity (and potentially DRA) will continue to reduce layer 1 & 2 conifers. Denser patches providing thermal and hiding cover for ungulates. Conifer ingress to date has been minimal.
2. Pruning slash not removed from underneath tree dripline (reduces fire resistance)
3. A few unburned slash piles from treatment
4. Ground cover of native bunchgrasses well established in open areas, heavy to pinegrass in denser conifer patches. Minimal browse species.
5. Small pockets of Py insect mortality (suspected woodborers)

Potential Maintenance Treatments:

1. Prescribed Burning. Scatter pruning slash from underneath Layer 1 & 2 stems to increase fire resistance. Expect some mortality on layer 1 & 2 stems. Small area, would likely have to be combined with other areas to make a logical burn unit.
2. Slashing to remove conifer ingress over time if prescribed fire not implemented.
3. Girdling / Topping / Inoculation of some Layer 1 Py stems to create snags.

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known Invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

Nature Conservancy of Canada

Luke Creek, Unit 01 (2.4 Ha, see Figure 3)

Post-Treatment Monitoring (2 Plots established)

Pre Treatment Data

Tree Layers	Tree Species Stems/Ha						**Total Stems/Ha**
	Py	Fd	Lw	Se	Pl	At	
1	163	363	72	0	0	181	779
2	127	454	0	0	0	0	581
3	109	1090	54	54	0	0	1307
4	0	436	0	18	0	36	490
Totals	**399**	**2343**	**126**	**72**	**0**	**217**	**3157**

Post 2021-2022 Treatment Data

Tree Layers	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
	Py	Fd	Lw	Se	Pl	At		
1	100	300	50	0	0	0	450	**-42**
2	50	400	0	0	0	0	450	**-23**
3	0	0	0	0	0	0	0	**-100**
4	0	200	0	0	0	0	200	**-59**
Totals	**150**	**900**	**50**	**0**	**0**	**0**	**1100**	

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Stocking still high for 'Open Forest', however, distribution is patchy and beetle activity will continue to reduce Layer 1 & 2 conifers. Conifer ingress to date has been minimal.
2. Some areas of pruning slash not removed from underneath tree dripline.
3. Scattered layers 1-4 aspen throughout (outside plots).
4. Heavy browse on saskatoon.
5. Forage is mostly pinegrass with native bunchgrasses dispersed in open areas.

Potential Maintenance Treatments:

1. Prescribed Burning. Expect some mortality on layer 1 & 2 stems. Smaller area / isolated, may be difficult to combined with other adjacent areas to make a logical burn unit. Scatter pruning slash from underneath layer 1 stems to increase fire resistance.
2. Slashing to reduce conifer ingress if prescribed burning not implemented.
3. Girdling / Topping / Innoculation of some Layer 1 Py stems to create snags.

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

Nature Conservancy of Canada

Luke Creek, Unit 02 (3.0 Ha, see Figure 3)

Post-Treatment Monitoring (2 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	163	363	72	0	0	181	779
2	127	454	0	0	0	0	581
3	109	1090	54	54	0	0	1307
4	0	436	0	18	0	36	490
Totals	**399**	**2343**	**126**	**72**	**0**	**217**	**3157**

	Post 2021-2022 Treatment Data							
	Tree Species						Total Stems/Ha	Changes in Stand Density (%)
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	0	50	150	0	0	0	200	**-74**
2	0	0	0	0	0	0	0	**-100**
3	0	100	100	100	0	0	300	**-77**
4	50	650	50	200	0	0	950	**94**
Totals	**50**	**800**	**300**	**300**	**0**	**0**	**1450**	

Observations:

1. Approximately 1 Ha on the east edge of this TU (Plot 5) is distinctly different than the remainder. This area is a moist site with full conifer stocking, including Fd,Lw,Sx & At. This area could have been left untreated as a reserve (thermal & hiding cover) adjacent to the open grasslands to the east & south. Dense overstorey resulting in mostly pinegrass and shrub layer.
2. The remainder of this TU (approximately 2 Ha - Plot 6) is appropriate for 'open forest' management. This portion of this TU is open Fd, Py and has well established native bunchgrasses and scattered saskatoon (heavily browsed).

Potential Maintenance Treatments:
Plot 5 area - none.
Plot 6 area –

1. Prescribed Burning. Expect some mortality on layer 1 & 2 stems. Small area, may be difficult to combined with other adjacent areas to make a logical burn unit.
2. Slashing to reduce conifer ingress if prescribed burning not implemented
3. Girdling / Topping / Inoculation of some Layer 1 Py stems to create snags

Suggested Future Monitoring:
Plot 5 area - none.
Plot 6 area –

1. Monitor for conifer ingress and health & distribution of forage / browse species.
2. Survey for known invasive plants prior to any prescribed burning treatments.
3. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

Nature Conservancy of Canada

Luke Creek, Unit 03 (0.6 Ha)

Post-Treatment Monitoring (1 Plot established)

Pre Treatment Data

Tree Layers	Tree Species Stems/Ha						**Total Stems/Ha**
	Py	Fd	Lw	Se	Pl	At	
1	660	180	20	0	0	100	960
2	300	100	40	0	0	140	580
3	560	220	0	0	0	40	820
4	220	140	0	0	0	0	360
Totals	**1740**	**640**	**60**	**0**	**0**	**280**	**2720**

Post 2021-2022 Treatment Data

Tree Layers	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
	Py	Fd	Lw	Se	Pl	At		
1	0	300	0	0	0	0	300	**-69**
2	100	200	0	0	0	0	300	**-48**
3	0	300	0	0	0	0	300	**-63**
4	0	800	0	0	0	0	800	**122**
Totals	**100**	**1600**	**0**	**0**	**0**	**0**	**1700**	

Observations:

1. This is a very small area in a deep, steep sided gully (moisture receiving site at gully bottom). Could have been left untreated as part of adjacent reserve (thermal & hiding cover).
2. Browse species are saskatoon and layer 4 Fd. Forage is mostly pinegrass with some native bunchgrasses on steep, south aspect slope.

Potential Maintenance:
Would not suggest any future treatments in this TU.

Suggested Future Monitoring:
None

Nature Conservancy of Canada

Luke Creek, Unit 03-1 (8.3 Ha, see Figure 3)

Post-Treatment Monitoring (6 Plots established)

Pre Treatment Data

Tree Layers	Tree Species Stems/Ha						**Total Stems/Ha**
	Py	Fd	Lw	Se	Pl	At	
1	660	180	20	0	0	100	960
2	300	100	40	0	0	140	580
3	560	220	0	0	0	40	820
4	220	140	0	0	0	0	360
Totals	**1740**	**640**	**60**	**0**	**0**	**280**	**2720**

Post 2021-2022 Treatment Data

Tree Layers	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
	Py	Fd	Lw	Se	Pl	At		
1	383	300	0	0	0	17	700	**-27**
2	117	17	0	0	0	0	134	**-77**
3	33	0	0	0	0	0	33	**-96**
4	17	117	0	0	0	0	134	**-63**
Totals	**550**	**434**	**0**	**0**	**0**	**17**	**1001**	

Observations:

1. Layer 2 & 3 conifers have been significantly reduced. Stocking still high for 'Open Forest', however, distribution is patchy and beetle activity will continue to reduce Layer 1 & 2 conifers. Conifer ingress to date has been minimal.
2. Some areas of pruning slash not removed from underneath tree dripline.
3. Scattered layers 1-4 aspen throughout.
4. Heavy browse on saskatoon.
5. Forage is mostly pinegrass with native bunchgrasses dispersed in open areas.
6. Small pockets of Py insect mortality (suspected woodborers).

Potential Maintenance Treatments:

1. Prescribed Burning. Expect some mortality on layer 1 & 2 stems. Smaller area, would want to combined with other adjacent areas to make a logical burn unit. Scatter pruning slash from underneath Layer 1 stems to increase fire resistance. Hydro transmission line adjacent to north boundary.
2. Slashing to reduce conifer ingress if prescribed burning not implemented.
3. Girdling / Topping / Innoculation of some Layer 1 Py stems to create snags.

Suggesting Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

The Nature Trust of British Columbia

Unit 03 - Blue (1.6 Ha, see Figure 4)

Post-Treatment Monitoring (2 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	267	467	0	0	0	0	734
2	0	67	0	0	0	67	134
3	0	467	0	0	0	100	567
4	0	67	0	0	0	0	67
Totals	**267**	**1068**	**0**	**0**	**0**	**167**	**1502**

	Post 2021-2022 Treatment Data							
	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	50	300	0	0	0	0	350	**-52**
2	0	0	0	0	0	0	0	**-100**
3	0	0	0	0	0	0	0	**-100**
4	0	0	0	0	0	0	0	**-100**
Totals	**50**	**300**	**0**	**0**	**0**	**0**	**350**	

Observations:

1. This TU was prescribed for pruning only. It is an open south-facing slope. Difference in pre / post stem density due to plot locations and pre-treatment data being combined with other similar treatment types within the prescription area.
2. Very minimal browse species present. Forage cover is healthy native bunchgrasses with some pinegrass

Potential Maintenance Treatments:

1. Prescribed Burning as part of a larger logical burn unit. Expect some mortality on layer 1 & 2 stems. Hydro transmission line south of TU.

2. Slashing to remove conifer ingress over time if prescribed fire not implemented.

Suggested Future Monitoring:

1. Survey for known invasive plants prior to any prescribed burning treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Monitor mortality from beetle activity that is dispersed throughout the Wycliffe Conservation area. Walk-through assessments should be sufficient to determine future actions.

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Unit 03 - Orange (6.5 Ha, see Figure 4)

Post-Treatment Monitoring (6 Plots established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	333	155	0	0	0	0	488
2	288	244	0	0	0	22	554
3	578	622	0	0	0	67	1267
4	288	333	0	0	0	111	732
Totals	**1487**	**1354**	**0**	**0**	**0**	**200**	**3041**

	Post 2021-2022 Treatment Data							
	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	225	75	13	0	0	0	313	**-36**
2	413	38	0	0	0	0	451	**-19**
3	88	0	0	0	0	0	88	**-93**
4	0	0	0	0	0	0	0	**-100**
Totals	**726**	**113**	**13**	**0**	**0**	**0**	**852**	

Observations:

1. Layer 3 & 4 conifers have been significantly reduced. Stocking still high for 'Open forest', however beetle activity will continue to reduce Layer 1 & 2 conifers. This area provides a transition from very open grasslands to the east and dense habitat in draw to the west.
2. Conifer ingress to date has been minimal.
3. Scattered clumps of layer 2 & 3 immature aspen (outside plots).
4. Heavy browse on saskatoon & some layer 4 Fd.

5. Forage species a mix of pinegrass and native bunchgrasses.
6. Seems to be some small untreated areas along boundary between our plots 5 & 6.
7. Unburned piles from treatment.

Potential Maintenance Treatments:

1. Area could be scheduled for prescribed burning as part of a logical burn unit or managed at higher densities to provide transition between very open grasslands to the east and dense stands in main draw to the west. If burning is prescribed, expect some mortality on layer 1, 2 & 3 stems.
2. Slashing to reduce conifer ingress if prescribed burning not implemented.

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

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Unit 03-1 (0.3 Ha, see Figure 4)

Post-Treatment Monitoring (1 Plot established)

	Pre Treatment Data						
	Tree Species Stems/Ha						**Total Stems/Ha**
Tree Layers	Py	Fd	Lw	Se	Pl	At	
1	1100	400	0	0	0	0	1500
2	400	300	0	0	0	0	600
3	1300	800	0	0	0	0	2100
4	0	750	0	0	0	0	650
Totals	**2800**	**2250**	**0**	**0**	**0**	**0**	**4850**

	Post 2021-2022 Treatment Data							
	Tree Species						**Total Stems/Ha**	**Changes in Stand Density (%)**
Tree Layers	Py	Fd	Lw	Se	Pl	At		
1	100	200	0	0	0	0	300	**-80**
2	300	400	0	0	0	0	700	**17**
3	300	800	0	0	0	0	1100	**-48**
4	0	0	0	0	0	0	0	**-100**
Totals	**700**	**1400**	**0**	**0**	**0**	**0**	**2100**	

Observations:

1. This TU is a very small, shallow draw. Layer 3 & 4 conifers have been significantly reduced; however, stocking is high for 'Open Forest' management. This area could have been combined with adjacent TU, or added to adjacent reserve area. Not clear as to rationale for separate TU.
2. Saskatoon is main browse species with heavy browse. Forage cover is dominated by pinegrass with scattered native bunchgrasses.
3. Unburned piles from treatment.

Potential Maintenance Treatments:

1. Area could be scheduled for prescribed burning as part of a logical burn unit or managed at higher densities to provide transition between very open grasslands to the east and dense stands in main draw to the west. If burning is prescribed, expect some mortality on layer 1, 2 & 3 stems.
2. Slashing to reduce conifer ingress if prescribed burning not implemented.

Suggested Future Monitoring:

1. Allow 2-3 years for a vegetation response to the recent treatments.
2. Monitor for conifer ingress and health & distribution of forage / browse species.
3. Survey for known invasive plants prior to any prescribed burning treatments.
4. Monitor mortality from beetle activity. Walk-through assessments should be sufficient to determine future actions.

Conclusion

All thinning treatments completed were successful in reducing the stand density of the areas assessed and moving the stands towards an “open forest” stand structure. In some cases, the percent change in stand density showed an increased percent change in the layer 4 stems. These stems were most likely germinants at the time of prescription development and treatment and should not be interpreted as high levels of conifer ingress. Overall, conifer ingress to date has been minimal in the treated units.