

Table S1. Thirty-year post-treatment measures of shrub relative abundance (% of total), total stems ha⁻¹, and relative biomass (% of total) for the two phases (*Menziesia ferruginea*, MEFE; *Xerophyllum tenax*, XETE) of the *Abies lasiocarpa*/*Clintonia uniflora* habitat type [50] and the subsequent 11 disturbance categories at the Miller Creek Demonstration Forest, Montana, USA (see Table 1 for descriptions). For treatments, H = harvested; P = prescribed fire; W = wildfire; and C = control. N-fixing plants in **bold**. T = < 0.5. Data available at [133].

Species	MEFE				XETE						
	East 2	East 3	North 12	UM	South 11	West 10	South 7	South 8	West 2	South 12./13	UX
	H	HP	HP	C	H	HP	HW	HPW	HW	W	C
Abundance											
Live											
<i>Acer glabrum</i>	–	–	3	5	–	3	1	–	–	T	9
<i>Alnus viridis ssp. sinuata</i>	3	28	68	2	–	15	5	–	11	T	–
<i>Amelanchier alnifolia</i>	–	–	–	1	2	–	3	T	–	T	4
<i>Ceanothus velutinus</i>	–	–	–	–	–	–	1	39	–	24	–
<i>Lonicera utahensis</i>	–	1	2	4	–	8	–	–	2	T	4
<i>Menziesia ferruginea</i>	34	27	1	27	–	–	–	–	–	–	–
<i>Paxistima myrsinites</i>	8	16	1	8	–	44	–	T	–	–	–
<i>Ribes lacustre</i>	2	1	2	2	–	–	–	–	–	–	1
<i>Rosa gymnocarpa</i>	–	–	–	–	–	1	2	1	2	2	10
<i>Rubus parviflorus</i>	3	1	6	2	–	4	–	–	–	–	–
<i>Salix scouleriana</i>	–	T	5	–	–	1	44	20	17	9	–
<i>Shepherdia canadensis</i>	–	–	1	T	71	–	14	T	26	T	–
<i>Spiraea betulifolia</i>	T	T	4	–	6	14	4	8	11	21	3
<i>Symphoricarpos albus</i>	–	–	T	1	–	2	–	–	3	1	–
<i>Vaccinium membranaceum</i>	47	20	2	41	4	5	T	T	1	2	66
Dead	3	6	4	7	18	3	24	32	27	38	3
Total stems ha ⁻¹	113750	67563	65187	13708	28750	63124	34375	52687	44000	63905	1584
Biomass											
Live											
<i>Acer glabrum</i>	–	–	4	6	–	2	T	–	–	T	23
<i>Alnus viridis ssp. sinuata</i>	40	76	55	17	–	56	6	–	14	T	–
<i>Amelanchier alnifolia</i>	–	–	3	4	T	–	5	T	–	T	1
<i>Ceanothus velutinus</i>	–	–	–	–	–	–	1	25	–	19	–
<i>Lonicera utahensis</i>	–	T	1	2	–	7	–	–	1	T	1
<i>Menziesia ferruginea</i>	32	9	T	22	–	–	–	–	–	–	–
<i>Paxistima myrsinites</i>	1	3	T	2	–	8	–	T	–	–	–
<i>Ribes lacustre</i>	2	T	T	1	–	–	–	–	–	–	T
<i>Rosa gymnocarpa</i>	–	T	–	–	–	T	T	T	T	T	T
<i>Rubus parviflorus</i>	1	T	T	T	–	1	–	–	–	–	–
<i>Salix scouleriana</i>	–	2	30	–	–	6	40	35	12	34	–
<i>Shepherdia canadensis</i>	–	–	1	T	79	–	11	T	34	1	–
<i>Spiraea betulifolia</i>	T	T	T	–	T	2	T	T	T	1	T
<i>Symphoricarpos albus</i>	–	T	T	T	–	T	–	–	T	T	–
<i>Vaccinium membranaceum</i>	21	3	T	11	1	1	T	T	T	T	43
Dead	3	6	6	34	20	16	37	39	39	45	33

Table S2. Thirty-year post-treatment measures of seedling relative abundance (% of total) and relative biomass (% of total) for the two phases (*Menziesia ferruginea*, MEFÉ; *Xerophyllum tenax*, XETE) of the *Abies lasiocarpa*/*Clintonia uniflora* habitat type [50] and the subsequent 11 disturbance categories at the Miller Creek Demonstration Forest, Montana, USA (see Table 1 for descriptions). For treatments, H = harvested; P = prescribed fire; W = wildfire; and C = control. T = < 0.5.

Species	MEFE				XETE						
	East 2	East 3	North 12	UM	South 11	West 10	South 7	South 8	West 2	South 12./13	UX
	H	HP	HP	C	H	HP	HW	HPW	HW	W	C
Abundance											
<i>Abies lasiocarpa</i>	29	27	60	69		30	4	2	14	19	41
<i>Larix occidentalis</i>	–	–	1	–		23	13	9	25	50	–
<i>Picea engelmannii</i>	14	65	30	4		30	8	3	18	19	1
<i>Pinus contorta</i>	–	–	–	–		–	42	19	14	–	–
<i>Pinus monticola</i>	–	–	–	–		–	–	2	–	–	–
<i>Populus tremuloides</i>	–	–	–	–		5	26	52	14	6	–
<i>Pseudotsuga menziesii</i>	57	8	8	11		12	8	9	14	6	3
<i>Taxus brevifolia</i>	–	–	–	10		–	–	5	–	–	47
Dead	–	–	–	7		–	–	–	–	–	8
Biomass											
<i>Abies lasiocarpa</i>	31	31	67	65		32	5	6	20	1	79
<i>Larix occidentalis</i>	–	–	T	–		18	25	17	36	72	–
<i>Picea engelmannii</i>	2	52	28	6		20	6	T	9	25	2
<i>Pinus contorta</i>	–	–	–	–		–	36	1	7	–	–
<i>Pinus monticola</i>	–	–	–	–		–	–	8	–	–	–
<i>Populus tremuloides</i>	–	–	–	–		7	13	54	4	2	–
<i>Pseudotsuga menziesii</i>	68	17	5	24		22	15	13	24	T	16
<i>Taxus brevifolia</i>	–	–	–	T		–	–	T	–	–	T
Dead	–	–	–	4		–	–	–	–	–	1

Table S4. Thirty-year post-treatment measures (mean with standard deviation in parentheses) of biomass and nitrogen in vegetation (herbaceous, shrub, seedling, tree, fine and coarse roots), woody residue, and soil (forest floor, mineral soil, soil wood) for the two phases (*Menziesia ferruginea*, MEFE; *Xerophyllum tenax*, XETE) of the *Abies lasiocarpa* *Clintonia uniflora* habitat type [50] and the subsequent 11 disturbance categories at the Miller Creek Demonstration Forest, Montana, USA (see Table 1 for descriptions). Different letters within rows represent significantly different values at $\alpha = 0.1$. For treatments, H = harvested; P = prescribed fire; W = wildfire; and C = control.

	MEFE				XETE						
	East 2 H	East 3 HP	North 12 HP	UM C	South 11 H	West 10 HP	South 7 HW	South 8 HPW	West 2 HW	South 12/13 W	UX C
Biomass (Mg ha⁻¹)											
Herbaceous	0.9 (0.5) bc	0.6 (0.4) ab	0.7 (0.2) ab	0.3 (0.3) a	4.7 (2.9) e	1.7 (0.7) cd	2.4 (2.9) cd	2.0 (1.6) cd	0.6 (0.3) ab	1.3 (1.5) bc	1.1 (1.0) bc
Shrub	5.2 (2.3) de	8.6 (4.4) e	19.3 (8.4) f	1.0 (1.1) ab	2.6 (2.4) bc	4.5 (2.1) bcd	3.7 (2.1) bc	5.3 (3.6) de	4.6 (2.6) bcd	7.2 (6.0) de	0.1 (0.3) a
Seedling	0.4 (0.6) ab	3.8 (3.1) c	2.7 (2.8) bc	1.4 (1.9) ab	0 (0) a	1.4 (1.3) ab	1.4 (1.4) ab	0.7 (0.6) ab	0.8 (1.3) ab	0.4 (0.5) a	1.7 (1.7) ab
Tree	23 (24) a	26 (14) a	4 (5) a	227 (102) b	12 (15) a	33 (10) a	38 (13) a	28 (31) a	49 (19) a	46 (31) a	185 (70) b
Fine roots	58 (3) abc	96 (6) abc	52 (7) ab	226 (17) e	49 (7) ab	45 (4) a	105 (5) abc	41 (16) a	138 (5) cd	102 (39) abc	148 (64) de
Coarse roots	6 (6) a	7 (4) a	1 (1) a	59 (26) b	3 (4) a	8 (3) a	10 (3) a	7 (8) a	13 (5) a	12 (8) a	48 (18) b
Woody residue	4 (3) abc	4 (3) abc	4 (4) abc	19 (8) e	4 (3) abc	4 (4) abc	1 (1) a	5 (1) bc	4 (2) abc	9 (8) cd	13 (4) d
Forest floor	189 (29) h	180 (43) gh	116 (2) def	139 (60) fg	89 (45) def	51 (30) bc	33 (6) ab	55 (23) bcd	34 (2) ab	45 (16) b	131 (40) efg
Mineral soil	218 (45) b	198 (7) ab	183 (14) a	155 (35) a	122 (36) a	131 (36) a	150 (26) a	125 (15) a	227 (15) c	118 (28) a	118 (20) a
Soil wood	58 (30) a	23 (7) a	34 (6) a	69 (88) a	5 (8) a	59 (16) a	0 (0) a	5 (8) a	0 (0) a	8 (10) a	17 (16) a
Nitrogen (kg ha⁻¹)											
Herbaceous	12 (7) ab	9 (5) ab	10 (3) ab	4 (3) a	36 (22) c	14 (5) b	18 (22) b	15 (12) b	7 (3) ab	11 (13) b	13 (11) b
Shrub	43 (19) de	68 (30) e	137 (48) f	6 (6) a	40 (37) bc	33 (15) d	25 (14) cd	42 (26) de	47 (31) de	55 (42) de	1 (2) a
Seedling	3 (4) a	33 (26) b	30 (31) b	9 (12) a	0 (0) a	9 (9) a	11 (11) a	6 (5) a	7 (10) a	3 (4) a	11 (11) a
Tree	110 (113) a	160 (78) a	24 (19) a	992 (490) b	76 (95) a	146 (48) a	223 (79) a	188 (205) a	309 (113) a	256 (171) a	917 (343) b
Fine roots	376 (20) bc	654 (22) cd	230 (6) ab	807 (56) d	212 (4) ab	201 (74) a	466 (35) bc	193 (50) a	743 (18) d	560 (318) bc	474 (256) bc
Coarse roots	28 (29) a	42 (20) a	6 (5) a	258 (127) b	20 (25) a	38 (13) a	58 (20) a	49 (53) a	80 (29) a	67 (45) a	238 (89) b
Woody residue	14 (9) ab	12 (8) ab	14 (14) ab	62 (28) d	12 (8) ab	10 (10) a	3 (2) a	11 (3) ab	10 (6) a	23 (21) b	39 (12) c
Forest floor	4738 (1073) c	3797 (460) bc	1519 (403) ab	2277 (1164) ab	1794 (554) ab	936 (6) a	514 (19) a	1386 (402) a	936 (361) a	884 (178) a	2010 (670) ab
Mineral soil	2513 (306) b	1577 (23) a	1323 (118) a	1487 (437) a	1485 (94) a	1382 (431) a	1469 (3) a	1361 (327) a	2068 (173) b	1279 (253) a	1109 (118) a
Soil wood	579 (286) a	418 (186) a	804 (48) a	959 (1212) a	138 (195) a	664 (235) a	0 (0) a	122 (172) a	0 (0) a	142 (164) a	258 (257) a

Table S5. Mean (standard deviation) nitrogen concentrations by tissue type (wood or foliage) and stem basal diameter (< 2 or >2 cm) for tree and shrub species observed on the 11 disturbance categories at the Miller Creek Demonstration Forest, Montana, USA (see Table 1 for descriptions). Means and *p*-values in **bold** indicate appropriateness for pooling samples across basal stem diameters. Means and *p*-values in *italics* are the overall value for wood (branches) or foliage within plant types (tree seedlings, shrubs, or N-fixing shrubs). Within plant types, different letters indicate significant differences at $\alpha = 0.1$.

	Nitrogen concentration (%)									
	Wood					Foliage				
	< 2		> 2		Mean	< 2		> 2		Mean
Tree seedlings^a		n	n	n			n	n	n	
<i>Abies lasiocarpa</i>	0.42 (0.10)	17	0.41 (0.14)	22	0.42 b	1.15 (0.28)	17	1.11 (0.21)	22	1.13 a
<i>Larix occidentalis</i>	0.46 (0.12)	9	0.55 (0.15)	12	0.50 b	1.75 (0.31)	10	1.80 (0.15)	9	1.77 b
<i>Picea engelmannii</i>	0.41 (0.14)	8	0.52 (0.12)	12	0.47 b	1.15 (0.18)	10	1.09 (0.13)	11	1.12 a
<i>Pinus contorta</i>	0.53 (0.13)	6	0.51 (0.05)	3	0.52 b	1.31 (0.18)	6	1.34 (0.13)	4	1.32 a
<i>Populus tremuloides</i>	0.48 (0.15)	12	0.41 (0.11)	9	0.44 b	1.84 (0.25)	14	1.98 (0.35)	8	1.91 b
<i>Pseudotsuga menziesii</i>	0.40 (0.17)	10	0.39 (0.10)	9	0.40 b	1.08 (0.18)	9	1.08 (0.18)	9	1.08 a
<i>Taxus brevifolia</i>	0.23 (0.08)	5	0.29 (0.03)	2	0.26 a	1.15 (0.11)	6	1.23 (0.10)	2	1.23 a
Mean	0.43		0.45		<i>0.43</i>	1.37		1.32		<i>1.35</i>
<i>p</i> -values	0.2899				<i>< 0.0001</i>	0.4450				<i>< 0.0001</i>
Shrubs										
<i>Acer glabrum</i>	0.48 (0.11)	ab 9	0.38 (0.04)	z 3		1.89 (0.43)	b 10	2.44 (0.21)	x 3	
<i>Amelanchier alnifolia</i>	0.49 (0.10)	ab 8	0.40 (0.08)	z 4		1.81 (0.31)	b 10	1.85 (0.26)	yz 5	
<i>Berberis repens</i>	0.80	ab 1	–	–		1.90 (0.01)	b 2	–	–	
<i>Cornus canadensis</i>	0.47	ab 1	–	–		1.45 (0.03)	c 2	–	–	
<i>Juniperus communis</i>	–	–	0.40	yz 1		–	–	1.16	z 1	
<i>Lonicera utahensis</i>	0.46 (0.11)	b 11	–	–		1.84 (0.36)	b 9	–	–	
<i>Menziesia ferruginea</i>	0.54 (0.17)	ab 10	0.40 (0.08)	yz 3		2.40 (0.25)	a 11	2.46 (0.47)	yz 3	
<i>Paxistima myrsinites</i>	0.65 (0.14)	a 12	–	–		1.54 (0.28)	bc 12	–	–	
<i>Ribes lacustre</i>	0.60 (0.13)	ab 10	–	–		2.07 (0.30)	ab 10	–	–	
<i>Rosa gymnocarpa</i>	0.59 (0.15)	ab 17	–	–		1.60 (0.29)	b 19	–	–	
<i>Rubus parviflorus</i>	0.58 (0.24)	ab 9	–	–		2.45 (0.61)	a 9	–	–	
<i>Salix scouleriana</i>	0.54 (0.13)	ab 21	0.51 (0.07)	xy 21		1.91 (0.52)	b 19	1.94 (0.43)	yz 23	
<i>Spiraea betulifolia</i>	0.54 (0.13)	ab 19	–	–		1.48 (0.32)	c 19	–	–	
<i>Symphoricarpos albus</i>	0.57 (0.17)	ab 5	–	–		1.98 (0.54)	ab 4	–	–	
<i>Vaccinium membranaceum</i>	0.61 (0.14)	ab 30	0.58 (0.10)	xy 2		1.91 (0.36)	b 33	2.27 (0.33)	x 2	
<i>p</i> -values	<i>0.0336</i>		<i>0.0028</i>			<i>< 0.0001</i>		<i>0.0312</i>		
Mean	0.56		0.48			1.86		2.01		
<i>p</i> -values	0.0015					0.0703				
Shrubs: N-fixing										
<i>Alnus viridis</i> ssp. <i>sinuata</i>	0.80 (0.25)	12	0.76 (0.20)	13	0.78 a	2.59 (0.25)	12	2.61 (0.33)	14	2.60 a
<i>Ceanothus velutinus</i>	0.92 (0.09)	10	0.93 (0.11)	9	0.92 b	2.05 (0.25)	10	1.89 (0.09)	9	1.97 b
<i>Shepherdia canadensis</i>	1.53 (0.19)	10	1.45 (0.20)	13	1.49 c	2.52 (0.49)	10	2.39 (0.26)	14	2.45 a
Mean	1.07		1.06		<i>1.06</i>	2.54		2.36		<i>2.42</i>
<i>p</i> -values	0.9161				<i>< 0.0001</i>	0.6327				<i>< 0.0001</i>

^a *Pinus monticola* and *Populus trichocarpa* not sampled.