

Table S-1. Physiographic, topographic and soils information for ten plots at Cascade Head Experimental Forest.

Plot	Area (ha)	Latitude	Longitude	Elev (m)	Slope (deg)	Aspect	Soil texture	Soil depth (B, m)	Parent material
CH01	0.4048	45.0456	-123.8973	298	16	S	silty clay loam	1.0-1.4	diorite, sandstone
CH03	0.4048	45.0457	-123.9040	236	8	W	silty clay loam	1.0-1.3+	sandstone, siltstone
CH04	0.4048	45.0648	-123.9413	294	12	SW	silty clay loam	1.3+	sandstone, siltstone
CH05	0.4048	45.0653	-123.9423	288	9	SW	silty clay loam	1.2+	sandstone, siltstone
CH06*	0.4048	45.0615	-123.9391	253	14	SW	silty clay loam	1.2+	sandstone, siltstone
CH07	0.4048	45.0627	-123.9398	277	25	S	silty clay loam	1.2+	sandstone, siltstone
CH08	0.4048	45.0646	-123.9453	252	25	S	silty clay	1.5+	sandstone, siltstone
CH10	0.4048	45.0631	-123.9917	312	37	NW	silty clay loam	0.9-1.3+	sandstone, siltstone
CH12	0.4048	45.0500	-123.9012	262	4	SW	silty clay loam	1.2-1.4+	sandstone, siltstone
CH13*	0.4048	45.0513	-123.9018	231	19	N	silty clay loam	1.2-1.4+	sandstone, siltstone

* CH06 and CH13: soil information is from nearby plots (CH07 for CH06, CH12 for CH13).

Table S-2. History of measurements and mortality assessments from ten, 0.4-ha plots at Cascade Head Experimental Forest.

Year	Activity
1935	Plots established: plot boundaries surveyed, trees ≥ 5.0 cm tagged and measured
1940	Tagged trees measured, mortality documented, ingrowth tagged and measured
1945	Tagged trees measured, mortality documented, ingrowth tagged and measured
1955	Tagged trees measured, mortality documented, ingrowth tagged and measured
1961	Mortality assessment, dead trees noted
1968	Tagged trees measured, mortality documented, ingrowth tagged and measured
1978	Tagged trees measured, mortality documented, ingrowth tagged and measured
1983	Tagged trees measured, mortality documented, ingrowth tagged and measured
1988	Tagged trees measured, mortality documented, ingrowth tagged and measured
1993	Tagged trees measured, mortality documented, ingrowth tagged and measured
1998	Tagged trees measured, mortality documented, ingrowth tagged and measured
2003	Tagged trees measured, mortality documented, ingrowth tagged and measured
2005	Reconstruction of CH06: live and dead trees measured, trees cored and aged
2008	Tagged trees measured, mortality documented, ingrowth tagged and measured
2013	Tagged trees measured, mortality documented, ingrowth tagged and measured

Table S-3 Plot level summaries.

Table S-3a. Plot-level data summary for CH01.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP ¹ (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH01	1935				659.58	642.54					
CH01	1940	5	0.00	0.00	639.82	679.36	19.76	14.59	0.61	0.46	10.28
CH01	1945	5	0.00	0.00	615.12	713.39	24.70	9.43	0.78	0.28	8.69
CH01	1955	10	0.00	0.00	548.42	725.24	66.70	48.61	1.14	0.70	6.05
CH01	1961*	6	0.00	0.00	508.90	732.58	39.52	38.40	1.24	0.90	7.62
CH01	1968	7	0.00	0.00	479.25	739.92	29.64	32.20	0.85	0.64	5.65
CH01	1978	10	0.00	0.00	449.60	772.35	29.64	38.98	0.64	0.54	7.14
CH01	1983	5	71.64	0.53	499.01	778.12	22.23	27.41	1.01	0.72	6.64
CH01	1988	5	34.58	0.17	516.30	795.57	17.29	16.31	0.70	0.42	6.75
CH01	1993	5	130.93	0.63	597.83	754.17	49.41	65.02	1.99	1.69	4.72
CH01	1998	5	192.69	1.09	746.05	691.28	44.47	91.65	1.53	2.56	5.75
CH01	2003	5	506.42	3.62	1156.13	548.93	96.34	171.02	2.73	5.53	5.74
CH01	2008	5	466.90	5.66	1208.00	301.73	415.02	273.12	8.51	12.86	5.18
CH01	2013	5	247.04	2.97	1333.99	252.26	121.05	95.40	2.09	7.32	9.19

1-Net Primary Productivity

Table S-3b. Plot-level data summary for CH03.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH03	1935				412.55	661.37					
CH03	1940	5	0.00	0.00	382.91	678.78	29.64	20.56	1.48	0.63	7.59
CH03	1945	5	0.00	0.00	368.08	711.70	14.82	6.17	0.79	0.18	7.82
CH03	1955	10	0.00	0.00	335.97	750.57	32.11	24.63	0.91	0.35	6.35
CH03	1961	6	0.00	0.00	323.62	776.46	12.35	13.22	0.62	0.30	6.52
CH03	1968	7	0.00	0.00	306.32	802.35	17.29	20.14	0.78	0.37	6.58
CH03	1978	10	0.00	0.00	284.09	841.82	22.23	28.00	0.75	0.35	6.75
CH03	1983	5	17.29	0.10	279.15	841.32	22.23	34.27	1.62	0.83	6.75
CH03	1988	5	37.06	0.22	306.32	860.73	9.88	11.11	0.72	0.27	6.10
CH03	1993	5	22.23	0.11	301.38	860.35	27.17	34.07	1.84	0.80	6.74
CH03	1998	5	37.06	0.17	321.15	861.71	17.29	23.57	1.17	0.55	4.99
CH03	2003	5	42.00	0.26	321.15	800.89	42.00	94.22	2.76	2.29	6.68
CH03	2008	5	86.46	0.52	370.55	696.04	37.06	129.73	2.42	3.47	4.98
CH03	2013	5	101.28	0.69	442.19	673.03	29.64	52.92	1.65	1.57	5.98

Table S-3c. Plot-level data summary for CH04.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH04	1935				474.31	643.78					
CH04	1940	5	0.00	0.00	464.43	682.66	9.88	5.94	0.42	0.19	8.96
CH04	1945	5	0.00	0.00	459.49	717.02	4.94	1.74	0.21	0.05	7.22
CH04	1955	10	0.00	0.00	442.19	778.78	17.29	11.95	0.38	0.17	7.37
CH04	1961	6	0.00	0.00	424.90	815.02	17.29	10.38	0.66	0.22	7.77
CH04	1968	7	0.00	0.00	400.20	851.27	24.70	12.53	0.85	0.22	6.97
CH04	1978	10	0.00	0.00	387.85	905.45	12.35	19.85	0.31	0.24	7.40
CH04	1983	5	133.40	1.31	484.19	873.27	37.06	68.34	1.99	1.56	7.23
CH04	1988	5	98.81	0.53	568.18	897.64	14.82	11.21	0.62	0.26	7.12
CH04	1993	5	106.23	0.55	659.58	894.70	14.82	28.78	0.53	0.65	5.17
CH04	1998	5	177.87	0.83	810.28	908.60	27.17	14.84	0.84	0.33	5.75
CH04	2003	5	106.23	0.51	889.33	927.90	27.17	24.81	0.68	0.55	8.82
CH04	2008	5	214.92	1.17	1067.19	934.17	37.06	26.57	0.85	0.58	6.57
CH04	2013	5	140.81	0.74	1141.30	913.07	66.70	46.72	1.28	1.02	5.12

Table S-3d. Plot-level data summary for CH05.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH05	1935				373.02	762.63					
CH05	1940	5	0.00	0.00	368.08	791.90	4.94	9.04	0.27	0.24	7.66
CH05	1945	5	0.00	0.00	360.67	814.60	7.41	11.06	0.41	0.28	6.75
CH05	1955	10	0.00	0.00	323.62	830.05	37.06	60.64	1.08	0.77	7.61
CH05	1961	6	0.00	0.00	316.21	844.61	7.41	5.53	0.39	0.11	3.35
CH05	1968	7	0.00	0.00	293.97	859.17	22.23	54.85	1.04	0.95	9.92
CH05	1978	10	0.00	0.00	271.74	890.19	22.23	43.81	0.78	0.52	7.48
CH05	1983	5	750.99	7.86	998.02	870.65	24.70	65.47	1.89	1.52	9.19
CH05	1988	5	74.11	0.41	1042.49	900.14	29.64	4.78	0.60	0.11	6.85
CH05	1993	5	116.11	0.65	1114.13	937.58	44.47	4.12	0.87	0.09	8.31
CH05	1998	5	49.41	0.31	1091.90	967.20	71.64	0.54	1.32	0.01	6.03
CH05	2003	5	27.17	0.11	1040.02	995.84	79.05	12.84	1.49	0.27	8.29
CH05	2008	5	12.35	0.08	963.44	1002.59	88.93	32.30	1.77	0.66	7.81
CH05	2013	5	2.47	0.01	872.04	961.66	93.87	79.07	2.03	1.63	7.63

Table S-3e. Plot-level data summary for CH06.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH06	1935				511.36	619.04					
CH06	1940	5	0.00	0.00	484.19	654.31	27.17	8.77	1.09	0.29	8.81
CH06	1945	5	0.00	0.00	461.96	684.09	22.23	10.30	0.94	0.32	8.02
CH06	1955	10	0.00	0.00	442.19	739.56	19.76	8.83	0.44	0.13	6.43
CH06	1961	6	0.00	0.00	429.84	749.00	12.35	44.53	0.47	1.03	9.00
CH06	1968	7	0.00	0.00	37.07	90.84	392.78	629.10	29.54	23.03	0.00
CH06	1978	10	574.72	0.36	609.27	99.35	2.47	4.49	0.69	0.51	1.30
CH06	1983	5	1684.54	1.74	2291.37	116.19	2.47	8.10	0.08	1.69	4.99
CH06	1988	5	394.41	0.57	2688.15	161.75	2.47	1.30	0.02	0.23	9.37
CH06	1993	5	7.41	0.01	2157.99	214.40	537.47	13.85	4.36	1.77	13.30
CH06	1998	5	7.41	0.00	1654.11	243.32	511.29	40.41	5.26	4.09	13.87
CH06	2003	5	0.00	0.00	1118.91	294.03	535.10	21.02	7.52	1.79	14.35
CH06	2008	5	4.94	1.77	1037.55	342.13	86.46	7.32	1.60	0.50	11.09
CH06	2013	5	0.00	0.00	864.62	360.75	172.92	23.95	3.58	1.44	8.51

Table S-3f. Plot-level data summary for CH07.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH07	1935				629.94	650.22					
CH07	1940	5	0.00	0.00	615.12	689.18	14.82	4.13	0.48	0.13	8.62
CH07	1945	5	0.00	0.00	590.42	704.24	24.70	15.30	0.82	0.45	6.07
CH07	1955	10	0.00	0.00	570.65	763.51	19.76	10.42	0.34	0.15	6.97
CH07	1961	6	0.00	0.00	531.13	779.73	39.52	25.29	1.19	0.56	6.92
CH07	1968	7	0.00	0.00	499.01	795.94	32.11	24.71	0.89	0.46	5.85
CH07	1978	10	0.00	0.00	464.43	830.16	34.58	34.70	0.72	0.44	6.89
CH07	1983	5	106.23	0.66	533.60	801.86	37.06	55.83	1.65	1.38	5.51
CH07	1988	5	34.58	0.25	543.48	798.12	24.70	34.91	0.94	0.89	6.23
CH07	1993	5	123.52	0.61	652.17	816.10	14.82	16.09	0.55	0.41	6.82
CH07	1998	5	93.87	0.68	701.58	770.53	44.47	71.71	1.40	1.82	5.23
CH07	2003	5	400.20	2.81	1044.96	739.15	56.82	67.96	1.67	1.83	7.32
CH07	2008	5	256.92	1.81	1173.42	631.28	128.46	144.62	2.59	4.26	7.35
CH07	2013	5	145.75	0.88	1242.59	628.14	76.58	41.54	1.34	1.35	7.68

Table S-3g. Plot-level data summary for CH08.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%)		NPP
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH08	1935				884.39	624.25					
CH08	1940	5	0.00	0.00	827.57	647.30	56.82	24.06	1.32	0.78	9.42
CH08	1945	5	0.00	0.00	795.45	676.88	32.11	12.35	0.79	0.38	8.39
CH08	1955	10	0.00	0.00	711.46	700.64	83.99	40.11	1.11	0.61	6.39
CH08	1961	6	0.00	0.00	694.17	724.69	17.29	7.01	0.41	0.17	5.18
CH08	1968	7	0.00	0.00	647.23	748.75	46.93	33.12	1.00	0.67	8.17
CH08	1978	10	0.00	0.00	573.12	768.23	74.11	56.11	1.21	0.78	7.56
CH08	1983	5	316.21	2.70	842.39	738.55	46.94	61.66	1.69	1.66	6.40
CH08	1988	5	264.33	1.45	1074.60	750.20	32.11	25.28	0.77	0.69	7.39
CH08	1993	5	148.22	0.84	1136.36	732.60	86.46	58.32	1.66	1.61	8.14
CH08	1998	5	160.57	0.98	1205.53	662.71	91.40	98.01	1.66	2.83	5.62
CH08	2003	5	301.38	2.08	1200.59	421.62	306.32	269.33	5.69	9.91	5.65
CH08	2008	5	254.45	2.09	1188.24	174.70	266.80	278.44	4.90	19.43	6.31
CH08	2013	5	192.69	2.22	1254.94	185.41	125.99	38.18	2.22	4.81	9.78

Table S-3h. Plot-level data summary for CH10.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH10	1935				400.20	676.50					
CH10	1940	5	0.00	0.00	365.61	699.94	34.58	20.95	1.79	0.63	8.88
CH10	1945	5	0.00	0.00	363.14	737.69	4.94	4.68	0.27	0.13	8.49
CH10	1955	10	0.00	0.00	321.15	774.34	42.00	36.11	1.22	0.50	7.28
CH10	1961	6	0.00	0.00	296.45	796.12	24.70	11.53	1.32	0.25	5.55
CH10	1968	7	0.00	0.00	269.27	817.89	27.17	34.98	1.36	0.64	8.11
CH10	1978	10	0.00	0.00	244.57	850.05	24.70	30.16	0.96	0.37	6.23
CH10	1983	5	0.00	0.00	237.15	868.83	7.41	8.78	0.61	0.21	5.51
CH10	1988	5	0.00	0.00	202.57	868.81	34.58	34.27	3.10	0.80	6.85
CH10	1993	5	79.05	0.87	264.33	862.33	17.29	31.86	1.77	0.74	5.08
CH10	1998	5	145.75	1.77	400.20	861.79	9.88	31.93	0.76	0.75	6.28
CH10	2003	5	150.69	1.54	538.54	892.08	12.35	5.03	0.63	0.12	7.06
CH10	2008	5	205.04	2.16	701.58	883.11	42.00	43.97	1.61	1.01	7.00
CH10	2013	5	229.74	2.37	864.62	918.31	66.70	15.31	1.98	0.35	10.10

Table S-3i. Plot-level data summary for CH12.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH12	1935				491.60	552.87					
CH12	1940	5	0.00	0.00	484.19	598.56	7.41	2.74	0.30	0.10	9.69
CH12	1945	5	0.00	0.00	454.55	613.16	29.64	23.73	1.26	0.81	7.66
CH12	1955	10	0.00	0.00	432.31	679.25	22.23	12.74	0.50	0.21	7.88
CH12	1961	6	0.00	0.00	410.08	712.22	22.23	15.82	0.88	0.39	8.13
CH12	1968	7	0.00	0.00	392.79	745.18	17.29	10.94	0.61	0.22	6.27
CH12	1978	10	0.00	0.00	335.97	724.69	56.82	77.07	1.55	1.09	5.66
CH12	1983	5	296.44	2.34	607.71	724.14	24.70	35.75	1.52	1.01	7.04
CH12	1988	5	145.75	0.89	723.81	716.47	29.64	45.32	1.00	1.28	7.53
CH12	1993	5	185.28	1.04	854.74	722.87	54.35	37.38	1.55	1.07	8.76
CH12	1998	5	42.00	0.24	802.87	727.40	93.87	28.47	2.30	0.80	6.60
CH12	2003	5	76.58	0.42	807.81	696.16	71.64	79.85	1.85	2.30	9.72
CH12	2008	5	24.70	0.26	671.94	521.92	160.57	208.50	4.34	6.87	6.85
CH12	2013	5	29.64	0.21	644.76	494.68	56.82	69.90	1.75	2.83	8.53

Table S-3j. Plot-level data summary for CH13.

Plot	Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
			Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
CH13	1935				538.54	517.05					
CH13	1940	5	0.00	0.00	526.19	555.06	12.35	7.44	0.46	0.29	9.09
CH13	1945	5	0.00	0.00	506.42	581.29	19.76	12.21	0.76	0.44	7.69
CH13	1955	10	0.00	0.00	447.13	613.50	59.29	40.20	1.24	0.71	7.24
CH13	1961	6	0.00	0.00	407.61	632.97	39.52	35.30	1.53	0.98	9.13
CH13	1968	7	0.00	0.00	392.79	652.43	14.82	8.60	0.53	0.20	4.01
CH13	1978	10	0.00	0.00	274.21	538.88	118.58	165.13	3.53	2.88	5.16
CH13	1983	5	491.60	4.75	699.11	463.27	66.70	106.71	5.42	4.32	6.22
CH13	1988	5	187.75	1.68	854.74	456.76	32.11	45.76	0.94	2.06	7.85
CH13	1993	5	217.39	1.64	1022.73	480.15	49.41	9.41	1.18	0.42	6.56
CH13	1998	5	51.88	0.78	956.03	486.43	118.58	31.94	2.43	1.37	7.64
CH13	2003	5	42.00	0.26	862.15	512.92	135.87	19.14	3.02	0.80	9.13
CH13	2008	5	4.94	0.04	696.64	477.33	170.45	77.69	4.31	3.23	8.42
CH13	2013	5	17.29	0.08	615.12	511.90	98.81	23.20	3.01	0.99	11.55

Table S-4. Means (standard deviations) of data from 10 plots at Cascade Head Experimental Forest (*continued on next page*).

Year	Interval	Ingrowth		All live trees		Mortality		Mortality rate (%/yr)		NPP (Mg/ha/yr)
		Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	Trees/ha	Biomass (Mg/ha)	
1935				537.55 (153.51)	635.02 (66.75)					
1940	5	0	0	515.81 (145)	667.71 (62.78)	21.74 (15.83)	11.82 (7.67)	0.82 (0.55)	0.37 (0.24)	8.90 (0.83)
1945	5	0	0	497.53 (137.19)	695.41 (64.45)	18.53 (10.03)	10.70 (6.1)	0.70 (0.32)	0.33 (0.21)	7.68 (0.81)
1955	10	0	0	457.51 (123.86)	735.54 (60.29)	40.02 (22.96)	29.42 (18.29)	0.84 (0.38)	0.43 (0.26)	6.96 (0.62)
1961	6	0	0	434.29 (119.76)	756.34 (60.14)	23.22 (12.28)	20.70 (14.16)	0.87 (0.42)	0.49 (0.35)	6.92 (1.82)
1968	7	0	0	371.79 (162.68)	710.38 (226.1)	62.50 (116.42)	86.12 (191.29)	3.74 (9.07)	2.74 (7.13)	5.74 (3.83)
1978	10	57.47 (181.74)	0.04 (0.11)	389.48 (130.55)	722.12 (242.74)	39.77 (34.63)	49.83 (45.06)	1.11 (0.91)	0.77 (0.78)	6.16 (1.88)
1983	5	386.83 (513.08)	2.20 (2.46)	747.17 (590.09)	707.62 (240.94)	29.15 (18.77)	47.23 (30.37)	1.75 (1.42)	1.49 (1.10)	6.55 (1.18)
1988	5	127.14 (124.41)	0.62 (0.56)	852.07 (705.67)	720.62 (235.62)	22.73 (10.97)	23.03 (16.39)	0.94 (0.81)	0.7 (0.6)	7.20 (0.94)
1993	5	113.64 (65.31)	0.70 (0.46)	876.13 (544.53)	727.53 (221.36)	89.57 (158.96)	29.89 (20.14)	1.63 (1.10)	0.92 (0.59)	7.36 (2.52)

1998	5	95.85 (67.54)	0.69 (0.53)	868.97 (388.42)	718.10 (217.39)	103.01 (147.86)	43.31 (32.75)	1.87 (1.31)	1.51 (1.30)	6.78 (2.6)
2003	5	165.27 (175.89)	1.16 (1.28)	897.96 (282.89)	682.95 (232.21)	136.27 (163.12)	76.52 (84.80)	2.80 (2.21)	2.54 (3.03)	8.28 (2.54)
2008	5	153.16 (153.00)	1.56 (1.67)	907.86 (282.06)	596.50 (283.13)	143.28 (119.89)	122.23 (102.05)	3.29 (2.29)	5.29 (6.26)	7.16 (1.74)
2013	5	110.67 (94.85)	1.02 (1.10)	927.62 (305.77)	589.92 (279.71)	90.91 (41.14)	48.62 (26.06)	2.09 (0.72)	2.33 (2.15)	8.41 (1.92)