Table S1. Characteristics of the 45 sample stands in the boreal forests of Ontario, Canada.

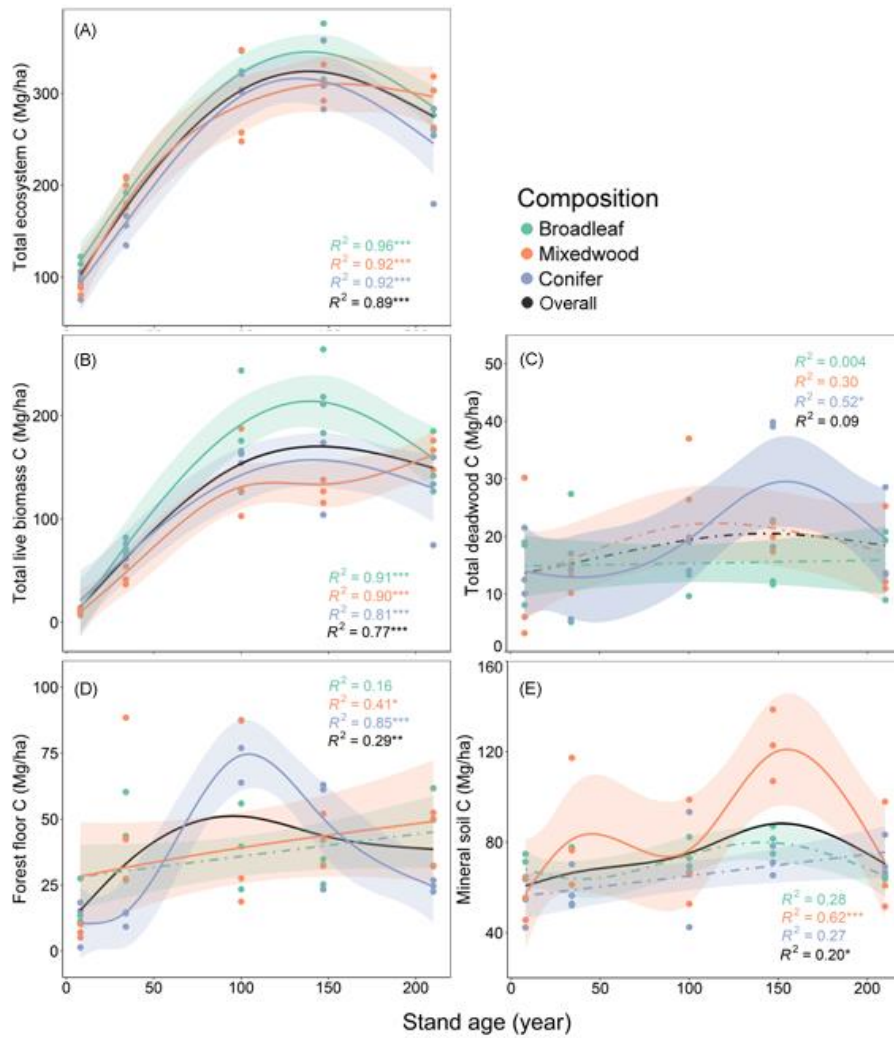| Stand age	Overstorey[a]	N	Stand density (stems ha^{-1}) or basal area (m^2 ha^{-1})[b]	Profit ($/ha)[b]	Net present value ($/ha)[b]	Total live biomass C (Mg/ha)[b]	Total deadwood C (Mg/ha)[b]	Forest floor C (Mg/ha)[b]	Mineral soil C (Mg/ha)[b]	Total ecosystem C (Mg/ha)[b]
	B	3	5933 (581)	-45.0 (0.60)	-45.0 (0.60)	9.35 (1.26)	15.21 (3.55)	17.4 (5.09)	70.17 (3.09)	112.1 (6.5)
8	C	3	7067 (1551)	-775.2 (0.94)	-775.2 (0.94)	12.57 (1.1)	14.69 (3.50)	11.64 (5.20)	53.56 (6.20)	92.46 (8.9)
	M	3	6933 (926)	-858.2 (0.77)	-858.2 (0.77)	10.95 (1.75)	13.16 (8.57)	7.47 (1.48)	55.24 (5.50)	86.81 (3.26)
	B	3	26 (1)	375.1 (18.4)	135.3 (6.62)	73.64 (4.32)	15.27 (6.49)	43.57 (9.65)	60.66 (8.57)	193.1 (7.97)
34	C	3	28 (2)	395.4 (135.2)	142.6 (48.8)	67.63 (4.37)	12.32 (3.44)	12.71 (1.74)	59.8 (5.31)	152.46 (9.5)
	M	3	13 (1)	-353.2 (70.6)	-127.4 (25.5)	44.13 (5.20)	12.89 (1.45)	52.74 (18.4)	85.0 (16.7)	194.8 (10.0)
	B	3	51 (7)	1118.4 (143.5)	30.3 (3.9)	195.07 (24.48)	14.28 (2.98)	39.66 (9.38)	74.85 (3.85)	323.9 (12.9)
99	C	3	52 (2)	2914.6 (208.4)	78.9 (5.6)	147.76 (11.1)	17.40 (1.68)	76.07 (6.85)	67.55 (14.7)	308.8 (6.17)
	M	3	43 (5)	1950.1 (1060.6)	52.8 (28.7)	139.45 (25.1)	27.72 (5.03)	44.52 (21.5)	72.4 (13.7)	284.1 (31.7)
	B	3	58 (8)	1613.2 (512.1)	6.9 (2.2)	221.86 (23.44)	15.58 (3.62)	30.9 (2.91)	81.17 (3.52)	349.5 (17.8)
147	C	3	51 (9)	2660.7 (538.6)	11.4 (2.3)	163.01 (31.44)	32.39 (7.09)	49.19 (12.9)	71.60 (3.74)	316.7 (11.4)
	M	3	35 (1)	2024.3 (651.1)	8.68 (2.8)	126.83 (6.45)	19.91 (1.48)	42.12 (5.68)	122.8 (9.15)	311.7 (11.4)
	B	3	41 (3)	1501.7 (197.4)	0.54 (0.07)	151.23 (17.43)	16.37 (3.72)	47.86 (8.59)	64.46 (0.39)	279.9 (12.5)
210	C	3	40 (8)	2856 (995.3)	1.03 (0.36)	122.73 (25.15)	18.54 (5.01)	24.67 (1.25)	73.0 (5.2)	238.9 (30.8)
	M	3	46 (3)	3554.1 (874.3)	1.29 (0.32)	163.36 (8.30)	16.14 (4.58)	45.0 (6.35)	70.13 (14.2)	294.6 (16.6)

Notes: Each age-overstorey combination has three replications.

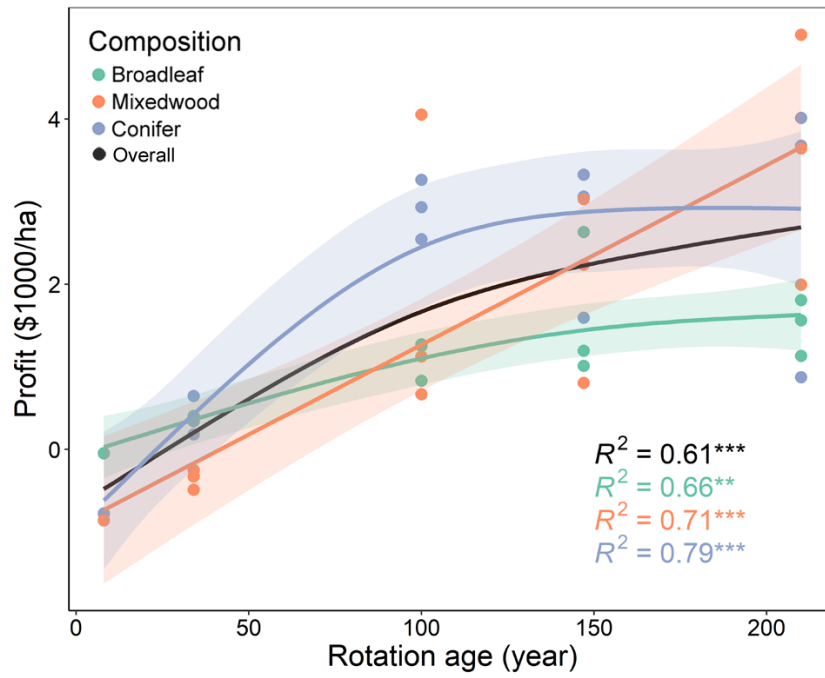[a] Overstorey types: B = broadleaf, C = conifer, M = mixedwoods.

[b] Values are means with 1 SE in parentheses. Stand density (stems ha^{-1}) was determined for the younger (8 years old) stands and basal area (m^2 ha^{-1}) for older stands.

Table S2. The relationships between total ecosystem carbon, total live biomass carbon, total deadwood carbon, forest floor carbon, mineral soil carbon and profit for overall and individual overstorey compositions.
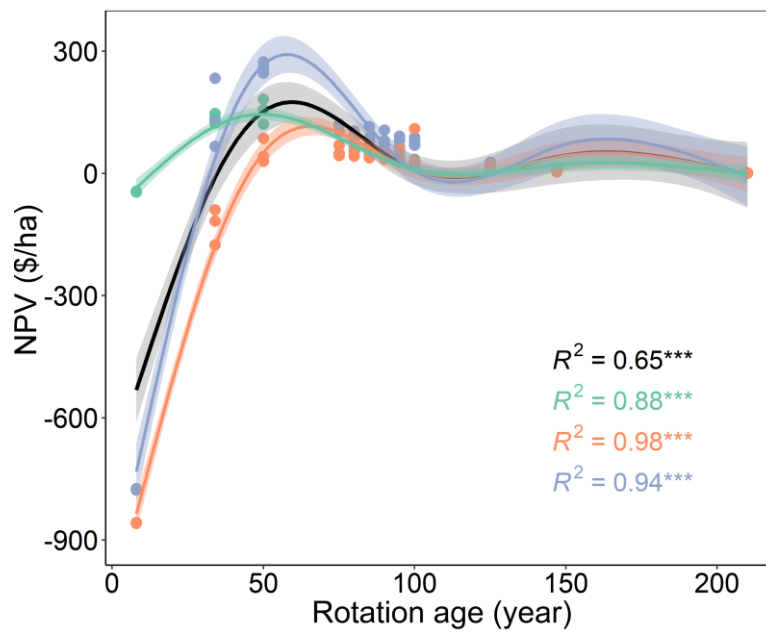
Response	Intercept			Profit			Profit^2			R^2 adjusted
	mean	*SE*	*t*	mean	*SE*	*t*	mean	*SE*	*t*	
Total ecosystem carbon										
Broadleaf	137	17.4	7.89	258	30.4	8.5	-80.4	12.6	-6.38	0.70
Mixedwood	207	5.56	37.3	90.3	6.48	13.9	-17.5	1.59	-10.9	0.85
Conifer	151	8.42	17.9	90.7	8.23	11.0	-13.2	2.44	-5.40	0.85
Overall	197	6.83	28.8	96.9	7.89	12.3	-19.4	2.14	-9.08	0.60
Total live biomass carbon										
Broadleaf	27.3	16.7	1.63	228	29.2	7.83	-71.3	12.1	-5.89	0.66
Mixedwood	70.3	4.19	16.8	54.9	4.88	11.2	-8.78	1.2	-7.29	0.81
Conifer	52.7	5.39	9.76	54.5	5.27	10.3	-6.37	1.56	-4.07	0.86
Overall	79.2	6.45	12.3	67.6	7.44	9.08	-12.9	2.02	-6.40	0.46
Total deadwood carbon										
Mixedwood	17.0	1.28	13.3	3.79	1.49	2.55	-0.82	0.36	-2.24	0.11
Conifer	16.2	1.80	8.96	2.06	0.86	2.40	-	-	-	0.12
Overall	16.1	0.85	18.9	3.36	0.98	3.42	-0.61	0.27	-2.27	0.10
Forest floor carbon										
Broadleaf	24.9	4.23	5.90	21.3	7.39	2.87	-6.76	3.06	-2.21	0.17
Mixedwood	38.3	3.58	10.7	12.5	4.18	2.99	-2.58	1.03	-2.50	0.17
Conifer	23.8	4.46	5.34	26.7	4.36	6.13	-5.53	1.29	-4.28	0.54
Overall	30.2	2.25	13.4	17.1	2.59	6.59	-3.21	0.71	-4.56	0.31
Mineral soil carbon										
Mixedwood	69.2	2.31	29.9	4.29	2.25	1.91	-0.70	0.74	-0.95	0.43
Conifer	59.1	2.56	23.1	5.75	2.49	2.30				0.20
Overall	71.9	2.42	29.7	8.91	2.79	3.19	-2.69	0.76	-3.55	0.09

Figure S1. Trends in total ecosystem carbon (C), total live biomass C, total deadwood C, forest floor C and mineral soil C with rotation age and overstorey compositions. The lines indicate smooth functions of the best model fit for the long-term trends using general additive models (GAM). Solid lines represent statistically significant trends while dashed lines show the insignificant trends. Shaded regions are the approximate 95% confidence intervals. Adjusted R^2 values indicate the model fit. Significant differences (α =0.05). Significant codes (p-value): 0 '***', 0.001'**', 0.01'*'.

$R^2 = 0.61$***
$R^2 = 0.66$**
$R^2 = 0.71$***
$R^2 = 0.79$***

Figure S2. Trends in changing profits with rotation ages and overstorey compositions. The lines indicate smooth functions of the best model fit for the long-term trends using general additive models (GAM). Shaded regions are the approximate 95% confidence intervals. Adjusted R^2 values indicate the model fit. Significant differences (α =0.05). Significant codes (p-value): 0 '***', 0.001'**', 0.01'*'.

Figure S3. Trends in changing the net present value (NPV) with rotation ages and overstorey compositions. The lines indicate smooth functions of the best model fit for the long-term trends using general additive models (GAM). Shaded regions are the approximate 95% confidence intervals. Adjusted R^2 values indicate the model fit. Significant differences (α =0.05). Significant codes (p-value): 0 '***', 0.001'**', 0.01'*'.