Supplementary Material:
North American tree migration tracking climate change in the West, slowed by reproduction in the East

Shubhi Sharma, Robert Andrus, Yves Bergeron, Michal Bogdziewicz, Don C. Bragg, Dale Brockway, Natalie L. Cleavitt, Benoit Courbaud, Adrian J. Das, Michael Dietze, Timothy J. Fahey, Jerry F. Franklin, Gregory S. Gilbert, Cathryn H. Greenberg, Qinfeng Guo, Janneke Hille Ris Lambers, Ines Ibanez, Jill F. Johnstone, Christopher L. Kilner, Johannes M.H. Knops, Walter D. Koenig, Georges Kunstler, Jalene M. LaMontagne, Diana Macias, Emily Moran, Jonathan A. Myers, Robert Parmenter, Ian S. Pearse, Renata Poulton-Kamakura, Miranda D. Redmond, Chantal D. Reid, Kyle C. Rodman, C. Lane Scher, William H. Schlesinger, Michael A. Steele, Nathan L. Stephenson, Jennifer J. Swenson, Margaret Swift, Thomas T. Veblen, Amy V. Whipple, Thomas G. Whitham, Andreas P. Wion, Christopher W. Woodall, Roman Zlotin, and James S. Clark

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1. Data

Sites are listed in table 2 with names that match those of Fig. 1d of the main text. Fitted species had multiple years of observations from multiple sites, which included 211,146 trees and 2,566,594 tree-years from 81 species. The fitted species are listed in table 3. Detailed site information is available at the website MASTIF. Data can be obtained from the Duke University Digital Repository. Covariates are referenced to site j (soils, elevation, climate norms), site-year j,t (climate anomalies), or tree-year ij,t (diameter, crown class) in table 1.

2. Extended tables

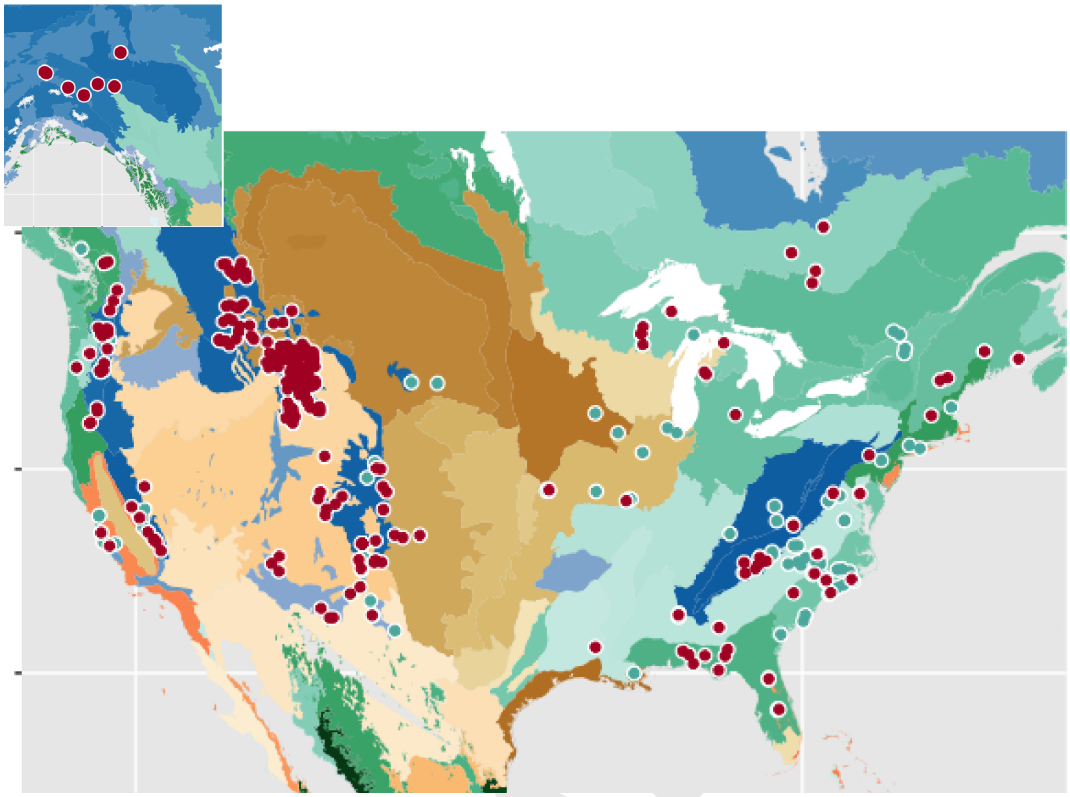

Fig. 1. MASTIF sites used for fecundity estimates with eco-regions listed in table 2: mixed forest (greens), montane (blues), grass/shrub/desert (browns), and taiga (blue-greens). Red dots are longitudinal studies, blue are opportunistic through iNaturalist MASTIF.

Table 1. Predictors in the model, not all of which are important for all species. Symbols are diameter G, temperature T, and moisture deficit index D.

Predictors	Symbol	Dimensions	Definition	Data source
		Fecundity model		
diameter	$G_{ij,t}$	cm	taken at 1.3 m	Inventories
diameter, quadratic	$G^2_{ij,t}$	cm^2	G squared	Inventories
shade	$S_{ij,t}$	ordinal	1 - 5 FIA/NEON classes	Inventories
D Jan-Aug	D_j	cm-mo	$\sum_{m=6}^{8}(P_{jm,t} - PET_{jm,t})$	see ??
D anomaly	$D_{j,t}$	cm-mo	anomaly for site	see ??
spring min T	$T_{sp,j}$	°C	Mean minimum daily spring T Feb - Mar	see ??
spring min T anomaly	$T_{sp,j,t}$	°C	anomaly for site	see ??
summer T	T_j	°C	Mean June - August	see ??
summer T, quadratic	T^2_j	°C^2	summer T squared	see ??
$D:G$	$D_jG_{ij,t}$	cm-mo × cm	$D:G$ interaction	
		Figure 2 maps		
mean annual T	T_j	°C	Annual average	see ??
D summer	D_j	cm-mo	$\sum_{m=6}^{8}(PET_{jm,t} - P_{jm,t})$	see ??
elevation	E_j	m	Distance above sea level.	Inventories
sand, clay	s_k,c_k	%	Proportion of soil type by weight at 250m resolution	GSFI
soil depth	d_k	cm	Distance between top soil and bedrock	GSFI

Subscripts reference tree i and site j in month m of year t. "sp" refers to spring.

Table 2. Sites used to fit the fecundity model listed by WWF ecoRegion. The 'data' column indicates seed traps (ST) and/or crop counts (CC).

Site	State/Pr	lon	lat	plots	data	PIs	citation
Appalachian Blue Ridge forests							
CWT-Cl: Coweeta Hydrologic Lab	NC	-83.43	35.05	7	ST CC	Clark	(1)
EPENN-St: East Bruns Twp	PA	-75.98	40.64	3	CC	Steele	
GRAN-Gr: Grandfather Mtn	NC	-82.17	35.65	6	CC	Greenberg	
GRSM-Cl: Great Smoky Mtns NP	TN	-83.49	35.57	3	ST	Clark	
MARS-Cl: Mars Hill	NC	-82.56	35.83	2	ST CC	Clark, Pearson	(2)
MLBS-Cl: Mtn Lake Biol Stn	VA	-80.52	37.36	10	ST CC	Clark	
PISG-Gr: Pisgah Nat Forest	NC	-82.82	35.28	21	CC	Greenberg	
SCBI-Mc: Smithsonian Cons Biol Inst	VA	-78.15	38.89	1	ST	McShea	(3)
Arizona Mountains forests							
MOPA-Re: Mountain Park	NM	-105.81	32.96	1	CC	Redmond	(4)
REMO-Wh: Red Mountain	AZ	-111.84	35.53	3	CC	Whipple, Gering, Whitham	
SAPA-Re: Sandia Park	NM	-106.37	35.16	1	CC	Redmond	(4)
SICI-Wi: Silver City	NM	-108.36	32.83	2	CC	Wion, Redmond	
WHIT-Wi: Whitewater	NM	-108.88	33.3	3	Cc	Wion, Redmond	
WINO-Wh: Winona	AZ	-111.41	35.15	3	CC	Whipple, Gering, Whitham	
British Columbia mainland coastal forests							
GLCR1-Fr: Glacier Creek1	WA	-121.9	48.8	1	CC	Franklin	(5)
GLCR2-Fr: Glacier Creek2	WA	-121.9	48.8	1	CC	Franklin	(5)
HEME-Fr: Heather Meadows	WA	-121.67	48.87	1	CC	Franklin	(5)
STPA-Fr: Stampede Pass	WA	-121.35	47.29	3	CC	Franklin	(5)
California montane chaparral woodlands							
HNHR-Kn: Hastings Nat History Res	CA	-121.57	36.38	1	CC	Knops, Koenig	(6)
Cascade Mountains leeward forests							
TUCR-Fr: Tunnel Creek	WA	-121.12	47.72	2	CC	Franklin	(5)
Central Canadian Shield forests							
COCH-Be: Cochrane	QC	-80.65	49.22	1	CC	Bergeron, Messaoud	(7)
LDUPT-Be: Lake Duparquet	QC	-79.2	48.5	1	CC	Bergeron, Messaoud	(7)
MASK-Be: Maskuchis	QC	-78.73	50.22	1	CC	Bergeron, Messaoud	(7)
Central forest grasslands transition							
UKFS-Cl: Univ Kansas Field Stn	KS	-95.19	39.04	1	ST CC	Clark	
WUSL-My: Wash Univ St Louis	MO	-90.56	38.53	1	ST	Myers	
Central Pacific coastal forests							
MAPK-Fr: Mary's Peak	OR	-123.55	44.51	1	CC	Franklin	(5)
Central S Cascades forests							
BAMT-Fr: Bare Mtn	WA	-122.07	45.9	1	ST	Franklin	(5)
BERK-Fr: Bessie Rock	OR	-122.32	42.75	3	CC	Franklin	(5)
BLLK-Fr: Blue Lake	WA	-122.25	46.19	1	CC	Franklin	(5)
DECU-Fr: Deadman curve	OR	-121.7	45.31	1	CC	Franklin	(5)
IRMT-Fr: Iron Mtn	OR	-122.15	44.4	1	CC	Franklin	(5)
MOLK-Fr: Mosquito lakes	WA	-121.77	46.13	3	CC	Franklin	(5)

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Table 2 – continued from previous page

Site	State/Pr	lon	lat	plots	data	PIs	citation
MORA-Hi: Mount Ranier	WA	-121.54	46.92	15	ST	HilleRisLambers	
PEPR-Fr: Peterson prairie	WA	-121.66	45.97	2	CC	Franklin	(5)
SAMT-Fr: Sand Mtn	OR	-121.93	44.39	1	CC	Franklin	(5)
SAPA-Fr: Santiam pass	OR	-121.9	44.69	3	CC	Franklin	(5)
SIRK-Fr: Sister Rock	WA	-122.04	45.95	1	CC	Franklin	(5)
SLBE-Fr: Sleeping beauty	WA	-121.67	46.12	1	CC	Franklin	(5)
STMT-Fr: Steamboat Mtn	WA	-121.73	46.14	2	CC	Franklin	(5)
TIRD-Fr: Timberline Road	WA	-122.11	46.09	1	CC	Franklin	(5)
WIMT1-Fr: Wildcat Mtn	OR	-122.12	44.34	1	Cc	Franklin	(5)
WIMT2-Fr: Wildcat Mtn	OR	-122.1	44.33	2	Cc	Franklin	(5)
WISP-Fr: Wickiup springs	OR	-122.3	42.61	2	Cc	Franklin	(5)
WREF-Cl: Wind River	WA	-122	45.84	10	ST CC	Clark, HilleRisLambers	
WREF-Hi: Wind River	WA	-121.95	45.82	1	ST CC	HilleRisLambers, Lutz	
Chihuahuan desert							
FOBA-Re: Fort Bayard	NM	-108.14	32.83	1	CC	Redmond	(4)
Colorado Plateau shrublands							
ALBU-Wi: Albuquerque	NM	-106.48	35.28	2	CC	Wion, Redmond	(8)
CEBO-Wi: Cebolla	NM	-106.46	36.49	2	CC	Wion, Redmond	(9)
DOLO-Wi: Dolores	CO	-108.63	37.86	2	CC	Wion, Redmond	(9)
GLPA-Wi: Glade Park	CO	-108.91	38.95	2	CC	Wion, Redmond	(9)
HOND-Wi: Hondo	NM	-105.61	36.63	4	CC	Wion, Redmond, Rodman	
HOTC-Wi: Hotchkiss	CO	-107.61	38.74	2	CC	Wion, Redmond, Rodman	(9)
LASA-Wi: La Sal	CO	-109.05	38.62	2	CC	Wion, Redmond	(9)
MAGD-Wi: Magdalena	NM	-107.13	34.03	3	CC	Wion, Redmond	(9)
MONT-Wi: Montrose	CO	-108.03	38.38	2	CC	Wion, Redmond	(9)
NATU-Wi: Naturita	CO	-108.57	38.13	2	CC	Wion, Redmond	(9)
SAFE-Re: Santa Fe	NM	-105.98	35.6	1	CC	Redmond	(9)
SEV-Zl: Cerro Montosa Sevilleta	NM	-106.54	34.37	2	CC	Zlotin, Macias	
SUCR-Wh: Sunset Crater	AZ	-111.39	35.87	6	CC	Whipple, Gering, Whitham	
Colorado Rockies forests							
BOCA-Pe: Boulder Canyon Main	CO	-105.31	40.01	1	CC	Pearse	
CANJ-Wi: Canjilon	NM	-106.4	36.48	2	CC	Wion, Redmond	(9)
HAYM-Wi: Hayman	CO	-105.17	39.18	5	CC	Wion, Redmond	
LAK-Ro: Lakes Fire	NM	-106.4	36.48	3	CC	Rodman	(9)
LV-Re: Las Vegas	NM	-105.25	35.59	1	CC	Redmond	(4)
MG-Ro: Mason Fire	CO	-106.4	36.48	2	CC	Rodman	(9)
MON-Ro: Montoya Fire	NM	-106.4	36.48	3	CC	Rodman	(9)
MR-Ro: Missionary Ridge	CO	-106.4	36.48	3	CC	Rodman	(9)
MVG-Ro: Mato Vega	NM	-106.4	36.48	3	CC	Rodman	(9)
NIWO-Cl: Niwot Ridge	CO	-105.56	40.04	6	ST CC	Clark	
NIWO-Ve: Niwot Ridge	CO	-105.56	40.01	9	ST	Veblen, Andrus	
PC-Ro: Pine Canyon	NM	-106.4	36.48	3	CC	Rodman	(9)
PECO-Re: Pecos	NM	-105.68	35.57	1	CC	Redmond	(4)

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Table 2 – continued from previous page

Site	State/Pr	lon	lat	plots	data	PIs	citation
POND-Wi: Ponderosa	NM	-106.62	35.71	2	CC	Wion, Redmond	(8)
RATN-Re: Raton	NM	-104.46	36.91	1	CC	Redmond	(4)
SAFE-Wi: Santa Fe	NM	-105.61	35.69	2	CC	Wion, Redmond	(9)
WACA-Wi: Waldo Canyon	CO	-104.94	38.95	1	Cc	Wion, Redmond	
WEMO-Wi: Wet Mountains	CO	-105.14	38.11	2	Cc	Wion, Redmond	
E forest boreal transition							
LMONT-Be: Lake Montalais	QC	-79.4	48.02	1	CC	Bergeron, Messaoud	(7)
Great Basin shrub steppe							
DSP-Re: Dayton State Park	NV	-119.47	39.19	3	CC	Redmond	
Interior Alaska Yukon lowland taiga							
BONA-Jo: Bonanza Creek	AK	-148.15	64.72	5	ST	Johnstone	
EAPL-Jo: Eagle Plains 26	YT	-137.29	65.99	5	CC	Johnstone	(10)
FAIR-Jo: Fairbanks 10	AK	-148.39	64.8	11	CC	Johnstone	(10)
LAGE-Jo: Lake George 20	AK	-144.98	63.81	5	CC	Johnstone	(10)
Interior Yukon Alaska alpine tundra							
CHIC-Jo: Chicken 23	AK	-142.65	63.31	4	CC	Johnstone	(10)
LELA-Jo: Lenore Lake 1	YT	-138.2	63.89	3	CC	Johnstone	(10)
SMR-Jo: Sixty Mile River 24	YT	-140.64	64.04	2	CC	Johnstone	(10)
Klamath Siskiyou forests							
ASRN-Fr: Ashland RNA	OR	-122.69	42.11	2	CC	Franklin	(5)
MEOV-Fr: Meridian Overlook	OR	-122.76	42.07	2	CC	Franklin	(5)
Mid Atlantic coastal forests							
BLSF-Br: Bladen Lakes SF	NC	-78.56	34.71	1	CC	Brockway	(11)
CALL-Cl: Callaway Forest Preserve	NC	-79.27	35.03	2	ST CC	Clark	
CROA-Co: Croatan NF	NC	-77.04	34.76	9	CC	Cohen	
GRSW-Cl: Green Swamp	NC	-78.3	34.09	1	ST	Clark	
SASF-Br: Sandhills State Forest	SC	-80.52	34.08	1	CC	Brockway	(11)
N California coastal forests							
UCSC-Gi: UC Santa Cruz	CA	-122.07	37.01	1	ST	Gilbert, Zhu	
N Central Rockies forests							
WBP-Mc: Alpha	MT	-114.06	48.31	37	CC	McIntire	
New England Acadian forests							
ASWP-Mo: Alder Stream Wilderness Preserve	ME	-69.07	45.2	1	ST CC	Moore, Clark	
BART-Fe: Bartlett Forest	NH	-71.28	44.07	6	ST	Fer, Dietze	
COMPT-Sc: Comstock Point	ME	-67.02	44.88	1	CC	Schlesinger, Dellwo	
HARV-Cl: Harvard Forest	MA	-72.26	42.42	12	ST CC	Clark	(12)
HBEF-Fa: Hubbard Brook	NH	-71.74	43.96	14	ST	Fahey, Cleavitt	(13)
Piney Woods forests							
KINF-Br: Kisatchie NF	LA	-92.41	31.34	1	CC	Brockway	(11)
S Central Rockies forests							
GYE-Sh: MT.gallatin 00038_001	MT	-110.01	45.36	167	CC	Shanahan	
YELL-Cl: Yellowstone	WY	-110.43	44.92	7	ST CC	Clark	
S Great Lakes forests							

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Table 2 – continued from previous page

Site	State/Pr	lon	lat	plots	data	PIs	citation
ANNA-Ib: Ann Arbor	MI	-84.01	42.46	4	ST	Ibanez	(4)
SE conifer forests							
APNF-Br: Apalachicola NF	FL	-85.02	30.15	1	CC	Brockway	(11)
BRSF-Br: Blackwater River SF	FL	-86.81	30.94	1	CC	Brockway	(11)
DSNY-Cl: Disney Wilderness Preserve	FL	-81.4	28.09	3	ST CC	Clark	
EAFB-Br: Eglin Air Force Base	FL	-86.53	30.48	5	CC	Brockway	(11)
EEF-Br: Escambia Exp For	AL	-87.16	31.13	7	CC	Brockway	(11)
JERC-Br: Jones Ecol Res Ctr	GA	-84.48	31.22	1	CC	Brockway	(11)
OSBS-Br: Ordway-Swisher Biol Stn	FL	-82.03	29.67	1	CC	Brockway	(11)
OSBS-Cl: Ordway-Swisher Biol Stn	FL	-82.01	29.7	6	ST CC	Clark	
STCB-Br: Southlands Timber Co	GA	-84.63	30.88	1	CC	Brockway	(11)
TTRS-Br: Tall Timbers Res Stn	GA	-85.84	30.91	1	CC	Brockway	(11)
SE mixed forests							
DUKE-Cl: Duke Forest	NC	-79.09	35.98	12	ST CC	Clark, laDeau	(1, 14, 15)
FBMB-Br: Fort Benning Military Base	GA	-85	32.34	1	CC	Brockway	(11)
SERC-Cl: Smithsonian Environm Res Ctr	MD	-76.53	38.87	9	ST CC	Clark	
TALL-Cl: Talladega	AL	-87.43	32.98	10	ST CC	Clark	
Sierra Nevada forests							
SEQU-Mo: Sequoia	CA	-118.79	36.57	23	ST	Das, Stephenson	
SOAP-Cl: Soaproot Saddle	CA	-119.27	37.04	6	ST CC	Clark	
YOSE-Mo: Yosemite	CA	-119.77	37.73	5	ST	Das, Stephenson	
W Great Lakes forests							
MICH-La: Michigamme Township Elm Creek	MI	-87.85	46.86	1	CC	LaMontagne	
PAFA-La: Park Falls County Rd E	WI	-89.66	45.94	1	CC	LaMontagne	
TREE-Cl: Treehaven	WI	-89.57	45.49	10	ST CC	Clark	
UMBS-Ib: Univ Michigan Biol Stn	MI	-84.71	45.55	5	ST	Ibanez	
UNDE-Cl: Univ Notre Dame Res Ctr	WI	-89.56	46.23	10	ST CC	Clark	
UNDE-Di: Univ Notre Dame Res Ctr	WI	-89.55	46.25	1	ST CC	Dietze, Fer, Clark	
WILW-La: Whisker Lake Wilderness	WI	-89.66	45.94	1	CC	LaMontagne	
WORU-La: Woodruff Arbor Vitae	WI	-89.66	45.94	1	CC	LaMontagne	
W short grasslands							
CMNM-Re: Capulin Mtn Nat Monument	NM	-103.98	36.78	1	CC	Redmond	(4)
KENT-Re: Kenton 1	OK	-102.95	36.9	2	CC	Redmond	(4)
Willamette Valley forests							
CAMT-Fr: Carpenter Mtn	OR	-122.75	45.11	1	CC	Franklin	
Wyoming Basin shrub steppe							
NORT-Wi: Northwest	CO	-108.67	40.59	2	CC	Wion, Redmond	(8)

Table 3. Species in inventory data and MASTIF network, listed by family. Variables are defined in the Fecundity section of table 1. Sample-sizes are *I* trees: trees on inventory plots used for prediction; *M* trees: number of trees on MASTIF plots used for fitting; *M* plots: number of MASTIF plots; *M* tree-yr: number of MASTIF tree-years. Symbols highlight species-predictor combinations having zero below or above the 95% credible interval ('++' and '—', respectively) or the 68% credible interval ('+' and '-', respectively). Mean estimates for the genus were used for inventory trees that could only be identified to genus or belonging to species for which there were not confident fits in the MASTIF model, which amounted to 7.2% of inventory trees.

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Aquifoliaceae														
Ilex coriacea	2	0	0	0										
Ilex decidua	2054	1682	3	38621	+	-	-	-		-				
Ilex glabra	20	0	0	0										
Ilex montana	334	296	6	6725	-	-	-	-	+	+		-	+	-
Ilex mucronata	31	0	0	0										
Ilex opaca	16943	220	33	4144	+	-	-	-	+	++	-	+	+	-
Ilex UNKN	118	0	0	0										
Ilex verticillata	79	0	0	0										
Ilex vomitoria	6	0	0	0										
Betulaceae														
Betula alba	66	0	0	0										
Betula alleghaniensis	56434	920	21	11074	++	-	-	—	++	-	-	+	++	—
Betula cordifolia	5	0	0	0										
Betula glandulosa	1	0	0	0										
Betula lenta	27779	751	23	10601	+	-	-	+	+	+	+	-	+	-
Betula neoalaskana	909	754	4	16939	++	—	-	-		++				
Betula nigra	4643	0	0	0										
Betula occidentalis	162	0	0	0										
Betula papyrifera	189666	109	19	653	+	-	-	+	+	+	-	+		
Betula populifolia	5413	0	0	0										
Betula UNKN	577	0	0	0										
Carpinus caroliniana	28938	3836	17	31986	++	-	—	—		++	—	++		
Ostrya virginiana	33687	952	17	8986	++	—	—			++			+	-
Cannabaceae														
Celtis laevigata	13467	53	25	368	++	—	-	—	++	+	—	+		
Celtis occidentalis	14376	175	9	817	+	-	-	+	+	++				
Celtis UNKN	71	0	0	0										
Cornaceae														
Cornus amomum	1	0	0	0										
Cornus drummondii	602	0	0	0										
Cornus florida	40170	8642	37	105620	++	—	+	—	++	—	—	++	++	-
Cornus foemina	3	0	0	0										
Cornus nuttallii	755	0	0	0										
Cornus UNKN	3	0	0	0										
Cupressaceae														
Callitropsis nootkatensis	575	578	7	5166	++	—	-	—		++	+	++		

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Calocedrus decurrens	18973	4720	22	90022	++	—	-	++	—	++	—	+	++	-
Juniperus ashei	21147	0	0	0										
Juniperus californica	857	0	0	0										
Juniperus coahuilensis	2767	0	0	0										
Juniperus communis	27	0	0	0										
Juniperus deppeana	13466	0	0	0										
Juniperus flaccida	21	0	0	0										
Juniperus monosperma	33880	211	4	4163	++			—						
Juniperus occidentalis	10023	0	0	0										
Juniperus osteosperma	71813	0	0	0										
Juniperus pinchotii	6107	0	0	0										
Juniperus scopulorum	18935	0	0	0										
Juniperus UNKN	170	0	0	0										
Juniperus virginiana	56443	989	28	20510	++	—	—	++	++	++	—	++	—	
Sequoiadendron giganteum	154	131	14	2389	+	-	-	++	++	+	+		+	-
Sequoia sempervirens	10123	2014	13	24015	++	-	-	++					++	
Thuja occidentalis	105380	1144	12	11120	++	+	—	-	+	++	—	++		
Thuja plicata	64002	544	20	3644	++	—	—	—	+	++	++	-	++	
Thuja UNKN	12	0	0	0										
Ebenaceae														
Diospyros texana	2287	0	0	0										
Diospyros UNKN	146	0	0	0										
Diospyros virginiana	9703	240	32	3577	+	-	—	+	+	+	++	—		
Ericaceae														
Arbutus arizonica	23	0	0	0										
Arbutus menziesii	9595	836	1	10032	++	—		—						
Arbutus xalapensis	5	0	0	0										
Oxydendrum arboreum	33309	2849	26	53070	-	-	-	—	++	++	-	—	+	-
Oxydendrum UNKN	436	0	0	0										
Fabaceae														
Cercis canadensis	11076	1427	18	12621	++	—	-	—	—	++	—	++		
Gleditsia triacanthos	6515	19	13	58	+	-	-	-	+	+	++	—	++	—
Robinia neomexicana	445	0	0	0										
Robinia pseudoacacia	21740	297	28	5219	++	-	-	+	++	+	—	++	+	-
Fagaceae														
Fagus grandifolia	85471	5535	67	54773	++	—	—	-	++	++	++	—	+	—
Notholithocarpus densiflorus	25407	6147	1	73764	++	-	-	—						
Quercus agrifolia	3758	1261	2	15041	+	-	—	++		++				
Quercus alba	115030	3678	73	33913	++	—	-	-		+	-	+	++	-
Quercus arizonica	10901	0	0	0										
Quercus bicolor	1704	0	0	0										
Quercus buckleyi	1032	0	0	0										
Quercus chapmanii	2	0	0	0										

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Quercus chrysolepis	16339	11	3	33	+	-				-				
Quercus cinerea	116	0	0	0										
Quercus coccinea	27078	291	35	5838	+	—	—	—	-	++	++	—	+	-
Quercus douglasii	4406	13	1	65	+			++		-				
Quercus ellipsoidalis	8833	0	0	0										
Quercus emoryi	4194	0	0	0										
Quercus engelmannii	29	0	0	0										
Quercus falcata	27812	103	18	1655	++	—	++	—	++	++	—	++		
Quercus fusiformis	8	0	0	0										
Quercus gambelii	49536	0	0	0										
Quercus garryana	5064	0	0	0										
Quercus geminata	96	0	0	0										
Quercus graciliformis	16	0	0	0										
Quercus gravesii	14	0	0	0										
Quercus grisea	1742	0	0	0										
Quercus hemisphaerica	219	0	0	0										
Quercus cerris	2	0	0	0										
Quercus hypoleucoides	2186	0	0	0										
Quercus ilicifolia	472	0	0	0										
Quercus imbricaria	2583	0	0	0										
Quercus incana	830	0	0	0										
Quercus kelloggii	10249	1282	16	24885	++	-	-	++	-	++		+	++	-
Quercus laceyi	297	0	0	0										
Quercus laevis	4450	0	0	0										
Quercus laurifolia	21759	0	0	0										
Quercus lobata	524	15	2	71	+	-		—		—				
Quercus lyrata	3101	0	0	0										
Quercus macrocarpa	14487	0	0	0										
Quercus margarettae	1736	0	0	0										
Quercus marilandica	10599	111	8	823	++	—	-	++	+	—	+	+	+	
Quercus michauxii	2424	0	0	0										
Quercus minima	1156	0	0	0										
Quercus montana	56575	1382	40	24227	++	—	-	—	+	—	+	+	++	—
Quercus muehlenbergii	6354	0	0	0										
Quercus nigra	65980	48	14	130	++	—	—		+	+	-			
Quercus oblongifolia	366	0	0	0										
Quercus oglethorpensis	43	0	0	0										
Quercus pagoda	6299	0	0	0										
Quercus palustris	2529	0	0	0										
Quercus parvula	3816	3816	1	45792	++	-	-	++		++				
Quercus phellos	10751	113	7	2342	++	-	-	—		—				
Quercus rubra	78170	4705	112	50780	++	—	—	—	—	—	++	—	++	-
Quercus rugosa	723	0	0	0										

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Quercus shumardii	1713	0	0	0										
Quercus similis	59	0	0	0										
Quercus sinuata	164	0	0	0										
Quercus stellata	52071	242	13	3331	+	-	—	—		—	++			
Quercus texana	1704	0	0	0										
Quercus UNKN	552	0	0	0										
Quercus velutina	52412	1542	55	14318	++	—	-	++	++	++	+	+	++	—
Quercus virginiana	15190	0	0	0										
Quercus wislizeni	4175	0	0	0										
Hamamelidaceae														
Liquidambar styraciflua	167242	4129	34	85759	++	—	—	—	++	—	++	++	—	
Juglandaceae														
Carya alba	34513	2601	33	23855	+	-	-	++	+	—	+	+	+	-
Carya aquatica	2298	0	0	0										
Carya carolinae-septentrionalis	20	0	0	0										
Carya cordiformis	12395	461	4	1877	+	-	+	+	+	+				
Carya floridana	1	0	0	0										
Carya illinoinensis	3023	0	0	0										
Carya laciniosa	925	0	0	0										
Carya myristiciformis	36	0	0	0										
Carya ovalis-glabra	33810	3790	43	34365	+	-	-	-	+	+	-	+	+	-
Carya ovata	19595	333	18	4112	+	-	-	+	++	—		+	+	-
Carya pallida	441	0	0	0										
Carya texana	12728	161	1	1127	++	—	-	-		-				
Carya UNKN	698	169	9	2494	+	-	—	-	++	++	++	-	+	-
Juglans califonica	22	0	0	0										
Juglans cinerea	1010	0	0	0										
Juglans hindsii	39	0	0	0										
Juglans major	77	0	0	0										
Juglans microcarpa	73	0	0	0										
Juglans nigra	14781	277	55	1323	++	-	-	—	-	++	-	+	+	-
Juglans UNKN	13	0	0	0										
Lauraceae														
Sassafras albidum	28066	1772	24	17300	++	—	—	+	++	+	—	++		+
Magnoliaceae														
Liriodendron tulipifera	93475	6031	36	75637	++	—	—	—	++	++	++	—	++	—
Magnolia acuminata	3316	0	0	0										
Magnolia fraseri	2398	514	5	11729	+	-	-	+	+	+	+			
Magnolia grandiflora	2356	41	23	54	++	—	—		+	-	+	—	+	
Magnolia macrophylla	778	0	0	0										
Magnolia tripetala	206	0	0	0										
Magnolia UNKN	213	0	0	0										
Magnolia virginiana	17498	0	0	0										

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Malvaceae														
Tilia americana	34335	407	14	5492	++	—	-	+	+	-	—	+	++	—
Tilia UNKN	25	0	0	0										
Moraceae														
Morus alba	864	0	0	0										
Morus microphylla	6	0	0	0										
Morus rubra	6353	242	6	5205	+	-	-	+						
Morus UNKN	113	0	0	0										
Nyssaceae														
Nyssa aquatica	10076	0	0	0										
Nyssa biflora	32679	0	0	0										
Nyssa ogeche	478	0	0	0										
Nyssa sylvatica	56759	4643	47	71203	—	-	-	-	++	++	++	—	+	-
Nyssa UNKN	6	0	0	0										
Oleaceae														
Fraxinus americana	54925	4024	26	61597	++	—	-	-	++	++	—	+	+	-
Fraxinus caroliniana	912	0	0	0										
Fraxinus latifolia	580	0	0	0										
Fraxinus nigra	42200	340	7	2203	+	-	-	-		-			+	
Fraxinus pennsylvanica	51879	77	10	424	+	-	—	-		-	++	-	+	-
Fraxinus profunda	917	0	0	0										
Fraxinus quadrangulata	609	0	0	0										
Fraxinus texensis	242	0	0	0										
Fraxinus UNKN	1140	0	0	0										
Fraxinus velutina	38	0	0	0										
Pinaceae														
Abies amabilis	39415	8089	42	57186	++	—	-	—	+	++	-	—	++	-
Abies balsamea	403190	1490	29	10186	-	-	—	-		-	++	—		
Abies concolor	63374	9587	29	187253	+	—	-	—	-	++	++	-	+	-
Abies fraseri	1749	1436	3	8611	++	—	-	+		++				
Abies grandis	45562	128	5	2876	-	-	-	-		—	++	-		
Abies lasiocarpa	138497	1729	22	8073	+	-	-	-	+	-	-	+	+	-
Abies lowiana	438	0	0	0										
Abies magnifica	13732	4477	17	89432	++	—	-	—	++	++	—			
Abies procera	4543	226	9	7841	++	—	—	+	++	+	+	-	+	-
Abies UNKN	1923	0	0	0										
Larix laricina	35013	14	9	149	+	-			++	+	++	—		-
Larix lyallii	577	0	0	0										
Larix occidentalis	31078	0	0	0										
Larix UNKN	1235	0	0	0										
Picea abies	3402	0	0	0										
Picea breweriana	52	0	0	0										
Picea engelmannii	79057	1698	32	5317	++	—	—	++	++	—	++	—	++	—

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Picea glauca	296230	1240	23	28506	++	-	—	+	++	-	++	—		
Picea mariana	524329	451	45	7768	+	-	—	++	++	++			+	-
Picea pungens	2379	0	0	0										
Picea rubens	46179	1831	24	10382	+	-	-		+	++		+	+	-
Picea sitchensis	21017	0	0	0										
Picea UNKN	19215	0	0	0										
Pinus albicaulis	21976	4124	203	17900	+	-		-	+	-			++	-
Pinus aristata	1280	0	0	0										
Pinus arizonica	20	0	0	0										
Pinus attenuata	970	0	0	0										
Pinus balfouriana	432	0	0	0										
Pinus banksiana	196620	128	1	1408	+	-		—		—				
Pinus cembra	648	0	0	0										
Pinus clausa	6477	0	0	0										
Pinus contorta	420284	1438	24	6265	+	-	-	-	+	-			+	-
Pinus coulteri	156	0	0	0										
Pinus discolor	1134	0	0	0										
Pinus echinata	46047	130	16	2354	++	—	-	—		—	—			
Pinus edulis	73878	1084	53	14951	++	—		++	+	—	—	++		
Pinus elliotii	86667	41	16	42	+	-	—		++		+			
Pinus flexilis	11211	511	23	1444	+								+	-
Pinus glabra	1368	0	0	0										
Pinus jeffreyi	7794	239	8	4732	+	-	-	++		+				
Pinus lambertiana	7876	2346	32	44974	+	-	-	++	+	++	++		+	-
Pinus leiophylla	157	0	0	0										
Pinus longaeva	327	0	0	0										
Pinus monophylla	28914	25	4	385	+	-		+		—				
Pinus monticola	7795	499	17	9694	+	-	-	—	++	+	++	+		
Pinus muricata	144	0	0	0										
Pinus nigra	266	0	0	0										
Pinus palustris	23611	835	60	5957	++	—	—	—		++	++	—		
Pinus ponderosa	153175	1221	84	26147	++	-	-	++		—	+		+	-
Pinus pungens	1420	0	0	0										
Pinus radiata	64	11	6	13	++	—	-		++					
Pinus remota	182	0	0	0										
Pinus resinosa	51822	124	13	1232	+	-	—	+	+	+	++			
Pinus rigida	12030	61	13	1075	++	-	—	-		—	—	++		
Pinus sabiniana	1058	26	13	42	++	—	—						+	
Pinus serotina	5534	20	13	28	++	—	—	++	++	—				
Pinus strobus	72245	1492	50	13906	++	-	—	—	+	—	-	++	++	++
Pinus sylvestris	5726	0	0	0										
Pinus taeda	561035	1688	66	25916	++	-	-	-	++	++	+	+	+	
Pinus UNKN	444	0	0	0										

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Pinus virginiana	43200	65	13	937	++	—	-	—	++	—				
Pseudotsuga macrocarpa	93	0	0	0										
Pseudotsuga menziesii	399526	9391	59	104383	++	—	-	—	++	++	++	+	+	-
Tsuga canadensis	60797	1113	45	15085	++	—	—	++	++	++	-	++	+	++
Tsuga caroliniana	78	0	0	0										
Tsuga heterophylla	135068	12333	28	60214	++	—	-	-		-	—	++	++	-
Tsuga mertensiana	37796	470	13	10968	++	-	—	—		—	-	++	++	—
Tsuga UNKN	66	0	0	0										
Platanaceae														
Platanus occidentalis	8521	56	15	172	++	-	-	—	++	—	-	+		
Platanus racemosa	47	0	0	0										
Platanus wrightii	25	0	0	0										
Rosaceae														
Amelanchier alnifolia	1	0	0	0										
Amelanchier arborea	2230	1941	16	16937	+	-	-	++	+	—	—	+	+	-
Amelanchier laevis	193	57	9	302	+	-	-	-	+	-	-	-		
Amelanchier sanguinea	3	0	0	0										
Amelanchier UNKN	8498	196	3	1316	+	-	-	-		+				
Prunus americana	914	0	0	0										
Prunus angustifolia	49	0	0	0										
Prunus avium	417	115	15	410	+	-	-	+	+	-	+	+	+	-
Prunus cerasus	2	0	0	0										
Prunus emarginata	1257	0	0	0										
Prunus nigra	16	0	0	0										
Prunus pensylvanica	12303	0	0	0										
Prunus persica	26	0	0	0										
Prunus serotina	79623	1264	35	13429	++	—	-	-	+	—	-	—	++	-
Prunus umbellata	2	0	0	0										
Prunus UNKN	734	0	0	0										
Prunus virginiana	2381	0	0	0										
Sorbus americana	2579	249	5	1454	+	-	-	++		-	++	-		
Sorbus aucuparia	88	0	0	0										
Sorbus decora	15	0	0	0										
Sorbus UNKN	27	0	0	0										
Sapindaceae														
Acer barbatum	3346	319	13	6924	++	—	—	-		++	++	-		
Acer circinatum	11795	10395	2	41544	+	-	-	-		+				
Acer glabrum	1312	0	0	0										
Acer grandidentatum	3372	0	0	0										
Acer leucoderme	80	0	0	0										
Acer macrophyllum	7552	13	5	112	+	-	—	+	+	-	-			
Acer negundo	19331	69	20	232	++	—	-		+	+			+	-
Acer nigrum	565	0	0	0										

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Table 3 – continued from previous page

Species	I trees	M trees	M plots	M tree-yr	G	G^2	S	$T_{sp,a}$	T_{sp}	D_a	D	DG	T	T^2
Acer pensylvanicum	16445	2307	29	41495	+	-	-	+	++	—	—	+	++	—
Acer platanoides	257	44	25	83	+	-	-	+	+	+	-	+	+	-
Acer rubrum	392092	17514	75	295423	+	-	-	—	+	—	—	—	++	-
Acer saccharinum	13	0	0	0										
Acer saccharum	212577	4009	34	40883	-	-	-	++	+	—	+	-	+	-
Acer spicatum	4477	197	8	4334	++	—	-	—	+	++	-	+		
Acer UNKN	532	0	0	0										
Scrophulariaceae														
Paulownia imperialis	5	0	0	0										
Paulownia tomentosa	675	18	8	225	+	-	-	+				+		
Simaroubaceae														
Ailanthus altissima	4441	173	12	1671	+	-	-	—	+	-	-	+		
Taxaceae														
Taxus brevifolia	3550	1934	9	8051	-	—	-	—	++	++	++	—		
Ulmaceae														
Ulmus alata	32777	1783	4	39728	+	-	-	+		—				
Ulmus americana	58865	527	12	8906	++	-	-	+	+	—	—	++		
Ulmus crassifolia	4623	0	0	0										
Ulmus pumila	1048	0	0	0										
Ulmus rubra	17291	1356	5	8595	++	—	-	+		—				
Ulmus serotina	67	0	0	0										
Ulmus thomasii	348	0	0	0										
Ulmus UNKN	468	106	7	1059	+	-	-	+	++	—	+	+		

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