National Park

Climate Change Atlas Tree Species Current and Potential Future Habitat, Capability, and Migration

USDA Forest Service Northern Research Station Landscape Change Research Group Iverson, Peters, Prasad, Matthews

sq. km sq. mi FIA Plots Area of Region 8,000.0 3,088.8 260

Species Information

The columns below provide breif summaries of the species associated with the region and described in the table on the next pages. Definitions are provided in the Excel file for this region.

Genus	Species					Potentia	al Change	in Habitat Suitability	Capability	Migration Potential					
Ash	3				Model			Scenario	Scenario		Scenario	Scenario		SHIFT	SHIFT
Hickory	7	Abu	ndance		Reliability	Adaptability		RCP45	RCP85		RCP45	RCP85		RCP45	RCP85
Maple	3	Abundant	3	High	12	21	Increase	30	36	Very Good	13	13	Likely	1	1
Oak	15	Common	22	Medium	34	49	No Change	14	12	Good	12	13	Infill	16	17
Pine	4	Rare	38	Low	32	9	Decrease	17	13	Fair	11	18	Migrate	0	0
Other	31	Absent	13	FIA	2		New	4	4	Poor	13	9	•	17	18
•	63		76		80	79	Unknown	15	15	Very Poor	10	6			
							-	80	80	FIA Only	2	2			
Unkno												13			
Potentia	Potential Changes in Climate Variables														

Potential Changes in Climate Variables

Temperatu	ıre (°F)				
	Scenario	2009	2039	2069	2099
Annual	CCSM45	67.4	69.1	70.6	70.8
Average	CCSM85	67.4	69.4	71.8	74.0
	GFDL45	67.4	70.3	71.4	72.6
	GFDL85	67.4	69.9	72.8	76.1
	HAD45	67.4	69.6	72.2	73.1
	HAD85	67.4	69.9	73.2	76.6
Growing	CCSM45	79.6	80.9	82.0	82.3
Season	CCSM85	79.6	81.3	83.5	86.1
May—Sep	GFDL45	79.6	82.8	83.8	85.9
, ,	GFDL85	79.6	82.5	85.6	89.5
	HAD45	79.6	82.0	84.3	84.8
	HAD85	79.6	82.3	86.0	88.8
Coldest	CCSM45	48.9	51.5	52.4	52.4
Month	CCSM85	48.9	51.6	52.8	54.2
Average	GFDL45	48.9	52.2	52.3	52.2
0 -	GFDL85	48.9	49.9	50.9	51.5
	HAD45	48.9	49.7	51.4	52.1
	HAD85	48.9	51.3	52.8	54.6
Warmest	CCSM45	83.2	84.2	84.6	84.7
Month	CCSM85	83.2	84.8	85.5	86.8
Average	GFDL45	83.2	86.8	86.9	88.4
_	GFDL85	83.2	86.7	88.1	90.6
	HAD45	83.2	86.0	86.9	87.0
	HAD85	83.2	86.3	88.3	89.2

Precipitati	on (in)				
	Scenario	2009	2039	2069	2099
Annual	CCSM45	56.9	58.3	64.9	62.7
Total	CCSM85	56.9	59.5	63.1	63.3
	GFDL45	56.9	59.5	69.5	58.9
	GFDL85	56.9	58.7	60.9	60.3
	HAD45	56.9	56.1	54.9	59.9
	HAD85	56.9	59.9	52.7	55.3
Growing	CCSM45	24.8	26.4	28.5	26.6
Season	CCSM85	24.8	25.1	26.0	24.5
May—Sep	GFDL45	24.8	27.3	34.5	27.3
	GFDL85	24.8	27.2	29.1	29.8 ***
	HAD45	24.8	23.8	23.6	25.6 ◆◆◆◆
	HAD85	24.8	24.5	21.4	21.6

NOTE: For the six climate variables, four 30-year periods are used to indicate six potential future trajectories. The period ending in 2009 is based on modeled observations from the PRISM Climate Group and the three future periods were obtained from the NASA NEX-DCP30 dataset. Future climate projections from three models under two emission scenarios show estimates of each climate variable within the region. The three models are CCSM4, GFDL CM3, and HadGEM2-ES and the emission scenarios are the 4.5 and 8.5 RCP. The average value for the region is reported, even though locations within the region may vary substantially based on latitude, elevation, land-use, or other factors.

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Current and Potential Future Habitat, Capability, and Migration

	Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SO N
Newtonton Liquidamibar styrriciffus WoH High Sy 50 688 6.5 m. inc. Medium Abundin Very Good Very Good 1 3	loblolly pine	Pinus taeda	WDH	High	96.3	3897.9	44.6 No change	Sm. dec.	Medium	Abundant	Good	Fair			1 1
Superleak Quercus laurifolia NDH Medium 79 371.0 6.0 No change Medium Common Fair Fair 1 5 5 5 5 5 5 5 5 5	water oak	Quercus nigra	WDH	High	90	655.1	8.1 Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1 2
Same Pinus elitotti NDH High 23,8 35,1 1,8 5 m.n. Sm. inc. Medium Common Good Good 1 1 5	sweetgum	Liquidambar styraciflua	WDH	High	97.5	608.8	6.8 Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1 3
Medium Nysa sylvatica WDL Medium 725 301.4 4.5 m.in. Sm. inc. Medium Common Nery Good Sm. 1	laurel oak	Quercus laurifolia	NDH	Medium	70	371.0	6.0 No change	No change	Medium	Common	Fair	Fair			1 4
American homesmn; muscle Carpinus caroliniana WSL Low 40 184, 0 41.5 m, inc. Sm. inc. Medium Common Good Good 1 8 8 8 8 8 1 1 1 1	slash pine	Pinus elliottii	NDH	High	23.8	351.2	14.8 Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1 5
Membram; musels Carpinus carolinana WSL Low 40 1840 4.1 Sm. inc. Sm. inc. Medium Common Good Good 1 9 19 10 10 10 10 10	blackgum	Nyssa sylvatica	WDL	Medium	72.5	301.4	4.5 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1 6
Section Sect	American holly	llex opaca	NSL	Medium	62.5	171.2	2.7 No change	No change	Medium	Common	Fair	Fair			1 7
Part	American hornbeam; musc	le\ Carpinus caroliniana	WSL	Low	40	164.0	4.1 Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1 8
Ped maple Acerrubrum Will High St. 25 15 24 Eg. Inc. Lg. Inc. High Common Very Good Very Good 11 11 12 13 13 14 14 14 14 14 14	willow oak	Quercus phellos	NSL	Low	33.8	157.1	4.7 Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1 9
Southern red oak Quercus falctarta WDL Medium 46.2 115.4 2.2 E.g. inc. L.g. inc. L	bald cypress	Taxodium distichum	NSH	Medium	16.3	123.1	7.6 Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1 10
Sweetbay Magnolia virginiana Magnolia virginiana Magnolia virginiana Magnolia virginiana Magnolia grandiflora NSL Low 28.8 88.8 3.1 No.change Magnolia grandiflora NSL Low 28.8 88.8 3.1 No.change Magnolia grandiflora NSL Low 26.8 88.8 3.1 No.change Magnolia grandiflora NSL Low 26.8 88.8 3.1 No.change Magnolia grandiflora NSL Low 26.2 Swampi chestrul oak Quercus inichausi NSL Low 30.6 Swampi chestrul oak Quercus pagoda NSL Medium Swampi chestru	red maple	Acer rubrum	WDH	High	57.5	121.5	2.4 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1 11
Search England NSS Medium SH Medium SH Low 28.8 SH 21.04 Sm. dec. Low Common Poor Poor Infill + Infill + 0.14	southern red oak	Quercus falcata	WDL	Medium	46.2	115.4	2.8 Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1 12
Southern magnolia Magnolia grandiflora NSL Low 288 88.8 3.1 No change No change Medium Common Fair Fair 1.15	sweetbay	Magnolia virginiana	NSL	Medium	38.8	100.3	2.6 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 13
White cak Quercus alba WOH Medium 43,7 84,5 1,9 Sm. inc. Sm. inc. High Common Very Good Very Good 1 16 17 17 18 18 19 19 19 19 19 19	water tupelo	Nyssa aquatica	NSH	Medium	8.8	91.2	10.4 Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0 14
Symphestmutoak Quercus michausii N.S. Low 26,2 81.8 3.1 No change No change Medium Common Fair Fair Fair 17 18 18 19 19 19 19 19 19	southern magnolia	Magnolia grandiflora	NSL	Low	28.8	88.8	3.1 No change	No change	Medium	Common	Fair	Fair			1 15
Pinus palustris NSH Medium 1.3 79.1 7.0 Ig. inc. Lg. inc. Medium Common Very Good Very Good Infill + Infill + 1 18 Igreen ash Fraxinus pennsylvanica WSH Low 30 67.2 2.7 Ig. inc. Lg. inc. Medium Common Very Good Very Good 1 19 Lg. Inc. Lg. inc. Medium Common Very Good 1 19 Lg. Inc. Lg. inc. Medium Common Very Good 1 19 12 12 12 12 12 1	white oak	Quercus alba	WDH	Medium	43.7	84.5	1.9 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1 16
Seen ash Fraxinus pennsylvanica WSH Low 30 67.2 2.7 kg.inc. Lg.inc. Lg.inc. Medium Common Very Good Very Good Very Good 1.7 20	swamp chestnut oak	Quercus michauxii	NSL	Low	26.2	81.8	3.1 No change	No change	Medium	Common	Fair	Fair			1 17
Shortleaf pine Pinus echinata WDH High 22,5 66,6 30,0 12, inc. 12, inc. 14, inc. 15, inc	longleaf pine	Pinus palustris	NSH	Medium	11.3	79.1	7.0 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1 18
Persea borbonia NSL Medium 26.3 61.0 3.1 1 1 1 1 1 1 1 1 1	green ash	Fraxinus pennsylvanica	WSH	Low	30	67.2	2.7 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 19
Persea borbonia	shortleaf pine	Pinus echinata	WDH	High	22.5	66.6	3.0 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 20
American beech Fagus grandifolia WDH High 17.5 56.0 3.2 Sm. inc. Sm. inc. Medium Common Good Good Infill + Infill + 1 23	cherrybark oak; swamp red	lo Quercus pagoda	NSL	Medium	26.3	61.0	3.1 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 21
Sugarberry Celtis laevigata NDH Medium 17.5 55.0 4.1 Lg. inc. Lg. inc. Medium Common Very Good Very Good 1 24	redbay	Persea borbonia	NSL	Low	37.5	60.3	1.9 No change	No change	High	Common	Good	Good			1 22
eastern hophornbeam; ironw Ostrya virginiana WSL Low 27.5 52.4 1.9 Sm. inc. Sm. inc. High Common Very Good Very Good 1 25 winged elm Ulmus alata WDL Medium 25 47.0 1.9 Lg. inc. Lg. inc. Medium Rare Good Good 1 26 Medium Rare Good Good 1 26 Medium Rare Good Good 1 27 ppost oak Quercus stellata WDH High 18.7 43.4 2.3 Lg. inc. Lg. inc. High Rare Good Good 1 28 sassafras Sassafras albidum WSL Low 18.7 40.3 2.2 Lg. dec. Sm. dec. Medium Rare Very Poor Poor Fair Infill I Infil	American beech	Fagus grandifolia	WDH	High	17.5	56.0	3.2 Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1 23
winged elm Ulmus alata WDL Medium 25 47.0 1.9 Lg. inc. Lg. inc. Medium Rare Good Good Good 1 26 American elm Ulmus americana WDH Heigh 18.7 43.4 2.4 Lg. inc. Lg. inc. Medium Rare Good Good Good 1 27 post oak Quercus stellata WDH High 18.7 43.4 2.2 Lg. inc. Lg. inc. High Rare Good Good Good 1 28 sassafras Sassafras albidum WSL Low 18.7 40.3 2.2 Lg. dec. Sm. dec. Medium Rare Poor Foor Fair Infill+ Infill+ 10 31 black hickory Carya aquatica NSL Medium 13.5 48. Lg. dec. Sm. dec. Medium Rare Poor Fair Infill+ Infill+ 10 31 black hickory Carya aquatica NSL Medium 12.5 19.8 1.6 Lg. inc. Lg	sugarberry	Celtis laevigata	NDH	Medium	17.5	55.0	4.1 Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1 24
American elm Ulmus americana WDH Medium 18.7 45.3 2.4 Lg. inc. Lg. inc. Medium Rare Good Good 1 27 27 post oak Quercus stellata WDH High 18.7 43.4 2.3 Lg. inc. Lg. inc. High Rare Good Good 1 28 assasfras Sassafras albidum WSL Low 18.7 40.3 2.2 Lg. dec. Sm. dec. Medium Rare Very Poor Very Poor	eastern hophornbeam; iron	nw Ostrya virginiana	WSL	Low	27.5	52.4	1.9 Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1 25
Dost oak Quercus stellata WDH High 18.7 43.4 2.3 Lg. inc. Lg. inc. High Rare Good Good 1 28	winged elm	Ulmus alata	WDL	Medium	25	47.0	1.9 Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1 26
sassafras Sassafras albidum WSL Low 18.7 40.3 2.2 Lg. dec. Sm. dec. Medium Rare Very Poor Very Poor Very Poor 0 29 water hickory Carya aquatica NSL Medium 15 36.3 2.4 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 30 slippery elm Ulmus rubra WSL Low 11.3 34.5 4.8 Lg. inc. Medium Rare Very Poor Very Poor 0 31 black hickory Carya texana NDL High 12.5 19.8 1.6 Lg. inc. Low Medium Rare Poor Good Infill + Infill + 1 33 river birch Betula nigra NSL Low 6.2 17.0 2.7 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + Infill + Infill + Infill +	American elm	Ulmus americana	WDH	Medium	18.7	45.3	2.4 Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1 27
water hickory Carya aquatica NSL Medium 15 36.3 2.4 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 30 slippery elm Ulmus rubra WSL Low 11.3 34.5 4.8 Lg. dec. Sm. dec. Medium Rare Very Poor Very Poor Very Poor O 31 lblack hickory Carya texana NDL High 12.5 20.9 1.7 No change Lg. inc. Medium Rare Poor Good Infill + Infill + 1 32 overcup oak Quercus lyrata NSL Medium 12.5 19.8 16. Lg. inc. Lg. inc. Lw Rare Fair Fair Infill + Infill + 1 34 mockernut hickory Carya alba WDL Medium 18.7 16.9 1.2 Lg. inc. Lg. inc. High Rare Poor Fair Infill + Infill + 1 35 lblack willow Salix nigra NSH Low 8.8 13.6 4.8 Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 36 lblack willow Salix nigra NSH Low 6.1 13.4 10.0 Sm. inc. Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 36 lblack willow Gleditisal triacanthos NSH Low 6.3 12.0 1.9 No change No change No change Medium Rare Poor Fair Infill + Infill + 2 37 low phoneylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Poor Poor Infill + Infill + 2 40 low phoneylocust Acer Darbatum NSL Low 5 10.7 2.1 Sm. dec. No change High Rare Poor Poor Fair Infill + Infill + 2 40 lblack cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Poor Fair Infill + Infill + 2 46 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Low Rare Poor Poor Fair Infill + Infill + 2 46 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Low Rare Poor Poor Poor Infill + Infill + 2 46 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Low Rare Poor Poor Poor Poor Infill + Infill + 2 46 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Leg. inc. Low Rare Poor Poor Fair Infill + Infill + 2 46 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Leg. inc. Low Rare Fair Fair Fair Fair Infill + 1 42 lblack cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Leg. inc. Leg. inc. Medium Rare Poor Poor Poor Infill + 1 45 lblack cherry Prunus serotina NDH High 1.2 8.8	post oak	Quercus stellata	WDH	High	18.7	43.4	2.3 Lg. inc.	Lg. inc.	High	Rare	Good	Good			1 28
slippery elm Ulmus rubra WSL Low 11.3 34.5 4.8 Lg. dec. Sm. dec. Medium Rare Very Poor Very Poor O 31 black hickory Carya texana NDL High 12.5 20.9 1.7 No change Lg. inc. Medium Rare Poor Good Infill + Infill ++ 1 32 overcup oak Quercus lyrata NSL Medium 12.5 19.8 1.6 Lg. inc. Lg. inc. Low Rare Fair Fair Infill + Infill + 1 33 river birch Betula nigra NSL Low 6.2 17.0 2.7 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 33 river birch Betula nigra NSL Low 6.2 17.0 2.7 No change Sm. inc. Medium Rare Poor Good Good 1 35 flowering dogwood Cornus florida WDL Medium 13.7 14.3 1.0 Sm. inc. Lg. inc. High Rare Good Good 5 1 35 flowering dogwood Cornus florida WDL Medium 13.7 14.3 1.0 Sm. inc. Sm. inc. Medium Rare Poor Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSH Low 8.8 13.6 4.8 Sm. inc. Lg. inc. Low Rare Poor Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSL Low 6.3 12.0 1.9 No change Sm. inc. Low Rare Very Poor Poor Infill + Infill + 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Poor Infill + Infill + 1 42 boxelder Acer barbatum NSL Low 3.8 10.1 2.7 Sm. dec. Sm. dec. High Rare Poor Poor Infill + Infill + 1 42 boxelder Acer pargundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 1 42 boxelder Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Lg. inc. Low Rare Fair Fair Infill + Infill + 1 45 loke Cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Lg. inc. Lg. inc. Medium Rare Foor Poor Infill + Infill + 1 45 loke Cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Lg. inc. Medium Rare Foor Fair Infill + Infill + 2 46 loke Cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Lg. inc. Medium Rare Foor Fair Infill + Infill + 2 47 loke Cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Lg. inc. Medium Rare Food Good Good Sood Sood Sood Sood	sassafras	Sassafras albidum	WSL	Low	18.7	40.3	2.2 Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 29
black hickory Carya texana NDL High 12.5 20.9 1.7 No change Lg. inc. Medium Rare Poor Good Infill Infill + 1 32 overcup oak Quercus lyrata NSL Medium 12.5 19.8 1.6 Lg. inc. Lg. inc. Low Rare Fair Fair Infill + Infill + 1 33 river birch Betula nigra NSL Low 6.2 17.0 2.7 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 34 mockernut hickory Carya alba WDL Medium 18.7 16.9 1.2 Lg. inc. Lg. inc. High Rare Good Good Good Target Infill + Infill + 1 34 mockernut hickory Carya alba WDL Medium 13.7 14.3 1.0 Sm. inc. Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 36 black willow Salix nigra NSH Low 8.8 13.6 4.8 Sm. inc. Lg. inc. Low Rare Poor Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSH Low 8.8 13.6 4.8 Sm. inc. Low Rare Poor Fair Infill + Infill + 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Poor Poor Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Poor Infill + Infill + 1 42 40 Nuttall oak Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Poor Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change High Rare Poor Fair Infill + Infill + 1 42 40 Nutash Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Low Rare Very Poor	water hickory	Carya aquatica	NSL	Medium	15	36.3	2.4 No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1 30
overcup oak Overcus lyrata Overcup oak Overcup oak Overcus lyrata Overcup oak	slippery elm	Ulmus rubra	WSL	Low	11.3	34.5	4.8 Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 31
river birch Betula nigra NSL Low 6.2 17.0 2.7 No change Sm. inc. Medium Rare Poor Fair Infill + Infill + 1 34 mockernut hickory Carya alba WDL Medium 18.7 16.9 1.2 Lg. inc. Lg. inc. High Rare Good Good 1 35 flowering dogwood Cornus florida WDL Medium 13.7 14.3 1.0 Sm. inc. Sm. inc. Medium Rare Fair Fair 1 36 black willow Salix nigra NSH Low 8.8 13.6 4.8 Sm. inc. Lg. inc. Low Rare Poor Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSH Low 1.2 13.4 10.8 No change Sm. inc. Low Rare Poor Poor Infill + Infill + 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Poor Infill + Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Poor Fair Infill + Infill + 1 42 to No change High Rare Poor Poor Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor O 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair Fair Infill + Infill + 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Low Rare Fair Fair Fair Fair 1 45	black hickory	Carya texana	NDL	High	12.5	20.9	1.7 No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1 32
mockernut hickory Carya alba WDL Medium 18.7 16.9 1.2 Lg. inc. Lg. inc. High Rare Good Good 1 35 flowering dogwood Cornus florida WDL Medium 13.7 14.3 1.0 Sm. inc. Sm. inc. Medium Rare Fair Fair 1 36 black willow Salix nigra NSH Low 8.8 13.6 4.8 Sm. inc. Lg. inc. Low Rare Poor Fair Infill I Infill I Infill I 2 37 pecan Carya illinoinensis NSH Low 1.2 13.4 10.8 No change Sm. inc. Low Rare Very Poor Poor Infill I Infill I Infill I 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill I Infill I Infill I 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Poor Poor Infill I I	overcup oak	Quercus lyrata	NSL	Medium	12.5	19.8	1.6 Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1 33
flowering dogwood Cornus florida WDL Medium 13.7 14.3 1.0 Sm. inc. Sm. inc. Medium Rare Fair Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSH Low 1.2 13.4 10.8 No change Sm. inc. Low Rare Poor Fair Infill + Infill + 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Poor Infill + Infill + 1 42 hoxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor Very Poor Date of the Infill + Infill + 2 43 lock Cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair Fair Infill + Infill + 2 46 lock Cherry Prunus serotina NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	river birch	Betula nigra	NSL	Low	6.2	17.0	2.7 No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1 34
black willow Salix nigra NSH Low 8.8 13.6 4.8 Sm. inc. Lg. inc. Low Rare Poor Fair Infill + Infill + 2 37 pecan Carya illinoinensis NSH Low 1.2 13.4 10.8 No change Sm. inc. Low Rare Very Poor Poor Infill + 1 1 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Poor Infill + Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor O 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Good Good 2 46	mockernut hickory	Carya alba	WDL	Medium	18.7	16.9	1.2 Lg. inc.	Lg. inc.	High	Rare	Good	Good			1 35
pecan Carya illinoinensis NSH Low 1.2 13.4 10.8 No change Sm. inc. Low Rare Very Poor Poor Infill + 2 38 sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Fair 0 41 florida maple Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	flowering dogwood	Cornus florida	WDL	Medium	13.7	14.3	1.0 Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1 36
sycamore Platanus occidentalis NSL Low 6.3 12.0 1.9 No change No change Medium Rare Poor Poor Infill + Infill + 2 39 honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Fair 0 41 florida maple Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Infill + Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	black willow	Salix nigra	NSH	Low	8.8	13.6	4.8 Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2 37
honeylocust Gleditsia triacanthos NSH Low 2.5 11.7 4.7 No change No change High Rare Fair Fair Infill + Infill + 2 40 Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Fair 0 41 florida maple Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Good Good 2 46 lg. inc. Lg. inc. Medium Rare Good Good 2 46	pecan	Carya illinoinensis	NSH	Low	1.2	13.4	10.8 No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2 38
Nuttall oak Quercus texana NSH Medium 2.5 10.7 4.3 Sm. dec. No change High Rare Poor Fair 0 41 florida maple Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	sycamore	Platanus occidentalis	NSL	Low	6.3	12.0	1.9 No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2 39
florida maple Acer barbatum NSL Low 5 10.7 2.1 Sm. dec. Sm. dec. High Rare Poor Poor Infill + 1 42 boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	honeylocust	Gleditsia triacanthos	NSH	Low	2.5	11.7	4.7 No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2 40
boxelder Acer negundo WSH Low 3.8 10.1 2.7 Sm. dec. No change High Rare Poor Fair Infill + Infill + 2 43 white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	Nuttall oak	Quercus texana	NSH	Medium	2.5	10.7	4.3 Sm. dec.	No change	High	Rare	Poor	Fair			0 41
white ash Fraxinus americana WDL Medium 12.5 10.1 0.8 Sm. dec. No change Low Rare Very Poor Very Poor 0 44 black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	florida maple	Acer barbatum	NSL	Low	5	10.7	2.1 Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		1 42
black cherry Prunus serotina WDL Medium 16.2 9.8 0.6 Lg. inc. Lg. inc. Low Rare Fair Fair 1 45 live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	boxelder	Acer negundo	WSH	Low	3.8	10.1	2.7 Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2 43
live oak Quercus virginiana NDH High 1.2 8.8 7.1 Lg. inc. Lg. inc. Medium Rare Good Good 2 46	white ash	Fraxinus americana	WDL	Medium	12.5	10.1	0.8 Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0 44
	black cherry	Prunus serotina	WDL	Medium	16.2	9.8	0.6 Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1 45
water elm Planera aquatica NSL Low 6.3 8.7 1.4 Sm. inc. Sm. inc. Medium Rare Fair Fair Infill + Infill + 1 47	live oak	Quercus virginiana	NDH	High	1.2	8.8	7.1 Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2 46
	water elm	Planera aquatica	NSL	Low	6.3	8.7	1.4 Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1 47



Big Thicket

National Park

Climate Change Atlas Tree Species

USDA Forest Service Northern Research Station Landscape Change Research Group Iverson, Peters, Prasad, Matthews

Current and Potential Future Habitat, Capability, and Migration

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv (ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO N
bluejack oak	Quercus incana	NSL	Low	2.5	8.4	3.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1 48
blackjack oak	Quercus marilandica	NSL	Medium	7.5	7.8	3 1.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1 49
cedar elm	Ulmus crassifolia	NDH	Medium	3.8	7.1	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2 50
common persimmon	Diospyros virginiana	NSL	Low	8.8	6.5	5 0.7 N	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			1 51
eastern redcedar	Juniperus virginiana	WDH	Medium	3.7	5.7	7 1.5	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2 52
pignut hickory	Carya glabra	WDL	Medium	1.3	4.4	3.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			2 53
bitternut hickory	Carya cordiformis	WSL	Low	1.2	4.1	3.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0 54
black walnut	Juglans nigra	WDH	Low	2.5	2.8	3 1.1 5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0 55
red mulberry	Morus rubra	NSL	Low	2.5	2.4	1.0 9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 56
swamp tupelo	Nyssa biflora	NDH	Medium	1.2	1.8	3 1.4 5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +		2 57
shagbark hickory	Carya ovata	WSL	Medium	1.2	1.4	1.1 5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0 58
black oak	Quercus velutina	WDH	High	1.3	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0 59
American basswood	Tilia americana	WSL	Medium	1.3	0.7	7 0.6 <mark>I</mark>	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0 60
Shumard oak	Quercus shumardii	NSL	Low	1.2	0.6	6 0.4 <mark>I</mark>	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0 61
wild plum	Prunus americana	NSLX	FIA	1.2	0.5	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0 62
Carolina ash	Fraxinus caroliniana	NSL	FIA	1.3	0.3	0.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0 63
striped maple	Acer pensylvanicum	NSL	Medium	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 64
serviceberry	Amelanchier spp.	NSL	Low	C	0	0 0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3 65
pawpaw	Asimina triloba	NSL	Low	C	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 66
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp	o. NSL	Low	C	0	0 0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3 67
shellbark hickory	Carya laciniosa	NSL	Low	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 68
hackberry	Celtis occidentalis	WDH	Medium	C	0	0 0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0 69
eastern redbud	Cercis canadensis	NSL	Low	C	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0 70
black ash	Fraxinus nigra	WSH	Medium	C	0	0 1	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3 71
silverbell	Halesia spp.	NSL	Low	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 72
cucumbertree	Magnolia acuminata	NSL	Low	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 73
bigleaf magnolia	Magnolia macrophylla	NSL	Low	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 74
sourwood	Oxydendrum arboreum	NDL	High	C	0) 0 !	Unknown	Unknown	High	Modeled	Unknown	Unknown			0 75
pin cherry	Prunus pensylvanica	NSL	Low	C	0	0 0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3 76
scarlet oak	Quercus coccinea	WDL	Medium	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 77
turkey oak	Quercus laevis	NSH	Medium	C	0	0 0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0 78
chinkapin oak	Quercus muehlenbergii	NSL	Medium	C	0	0 0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0 79
northern red oak	Quercus rubra	WDH	Medium	C	0	0 0	Unknown	Unknown	High	Absent	Unknown	Unknown			0 80

