

**One x One Degree**  
**Climate Change Atlas Tree Species**  
 Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	9,813.8	3,789.1	148

**Species Information**

The columns below provide brief 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	Abundance		Model		Potential Change in Habitat Suitability		Capability to Cope or Persist		Migration Potential			
				Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT		
				High	Medium	Increase	RCP45	RCP85	Very Good	Good	Fair	RCP45	RCP85
Ash	3			17	25	25	28		9	11		2	2
Hickory	7			31	46	17	17		16	16		13	16
Maple	5	Abundant	1	32	10	21	18		14	13		2	3
Oak	17	Common	33	5		11	12		16	17		17	21
Pine	4	Rare	34			11	12		7	5			
Other	32	Absent	15			11	10		2	2			
	<b>68</b>		<b>83</b>			<b>85</b>	<b>85</b>		<b>70</b>	<b>69</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	57.6	59.4	61.6	61.9	
	CCSM85	57.6	59.8	62.5	65.6	
	GFDL45	57.6	61.8	62.7	63.5	
	GFDL85	57.6	60.4	63.7	67.4	
	HAD45	57.6	60.3	63.6	65.0	
HAD85	57.6	60.7	65.4	69.4		
Growing Season (May—Sep)	CCSM45	73.6	75.4	77.2	77.9	
	CCSM85	73.6	75.8	78.7	82.7	
	GFDL45	73.6	78.5	79.5	80.8	
	GFDL85	73.6	77.0	80.9	85.4	
	HAD45	73.6	76.9	80.2	81.9	
HAD85	73.6	77.5	83.9	87.7		
Coldest Month Average	CCSM45	32.4	33.9	35.6	36.0	
	CCSM85	32.4	35.5	36.5	38.1	
	GFDL45	32.4	36.6	36.7	37.0	
	GFDL85	32.4	34.5	35.7	36.2	
	HAD45	32.4	33.6	35.9	36.1	
HAD85	32.4	34.7	36.8	38.5		
Warmest Month Average	CCSM45	79.0	80.8	81.9	82.4	
	CCSM85	79.0	81.4	83.1	84.9	
	GFDL45	79.0	82.2	83.6	84.5	
	GFDL85	79.0	82.6	84.8	87.4	
	HAD45	79.0	83.2	85.8	86.6	
HAD85	79.0	85.0	89.4	91.3		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.1	46.9	52.4	51.0	
	CCSM85	47.1	51.0	51.7	54.6	
	GFDL45	47.1	54.3	57.3	59.4	
	GFDL85	47.1	53.8	58.5	62.1	
	HAD45	47.1	46.8	50.3	50.0	
HAD85	47.1	47.8	45.6	50.6		
Growing Season (May—Sep)	CCSM45	19.2	17.9	19.4	19.0	
	CCSM85	19.2	19.8	18.1	19.0	
	GFDL45	19.2	22.1	22.2	22.8	
	GFDL85	19.2	21.8	22.4	23.2	
	HAD45	19.2	17.9	17.0	16.8	
HAD85	19.2	18.0	14.4	14.9		

**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-DGP30 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.

**Cite as:** Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. *Forests*. 10(11): 989. <https://doi.org/10.3390/f10110989>.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
sweetgum	Liquidambar styraciflua	WDH	High	70.9	643.2	11.9	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	1
sugar maple	Acer saccharum	WDH	High	69.1	431.4	8.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
white oak	Quercus alba	WDH	Medium	55.9	333.4	8.6	No change	No change	High	Common	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	46.8	292.7	8.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
silver maple	Acer saccharinum	NSH	Low	20.6	286.7	27.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	5
pignut hickory	Carya glabra	WDL	Medium	48.1	269.0	5.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	6
red maple	Acer rubrum	WDH	High	41	256.1	8.6	No change	No change	High	Common	Good	Good			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	52.9	251.8	6.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	46.4	224.3	4.9	Sm. dec.	No change	High	Common	Fair	Good			1	9
Virginia pine	Pinus virginiana	NDH	High	17.8	207.2	10.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
black oak	Quercus velutina	WDH	High	51	188.6	4.1	No change	No change	Medium	Common	Fair	Fair			1	11
white ash	Fraxinus americana	WDL	Medium	45.6	181.6	3.8	No change	No change	Low	Common	Poor	Poor			0	12
loblolly pine	Pinus taeda	WDH	High	6.7	175.6	23.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	13
sassafras	Sassafras albidum	WSL	Low	62.6	173.7	5.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
winged elm	Ulmus alata	WDL	Medium	51.1	168.7	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
sycamore	Platanus occidentalis	NSL	Low	36.8	149.1	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
black cherry	Prunus serotina	WDL	Medium	35.4	142.0	3.9	No change	No change	Low	Common	Poor	Poor			0	17
post oak	Quercus stellata	WDH	High	28.3	140.9	5.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
eastern redcedar	Juniperus virginiana	WDH	Medium	27.1	118.2	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
hackberry	Celtis occidentalis	WDH	Medium	40.4	112.1	5.4	No change	Sm. inc.	High	Common	Good	Very Good			1	20
American elm	Ulmus americana	WDH	Medium	62	110.5	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
shagbark hickory	Carya ovata	WSL	Medium	36.5	107.8	2.6	No change	No change	Medium	Common	Fair	Fair			1	22
mockernut hickory	Carya alba	WDL	Medium	27.3	105.9	5.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	36.1	91.4	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
black locust	Robinia pseudoacacia	NDH	Low	23.1	84.8	7.9	No change	No change	Medium	Common	Fair	Fair			1	25
slippery elm	Ulmus rubra	WSL	Low	24.8	69.7	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
common persimmon	Diospyros virginiana	NSL	Low	29.4	66.2	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
chinkapin oak	Quercus muehlenbergii	NSL	Medium	12.4	65.8	3.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	28
ailanthus	Ailanthus altissima	NSL	FIA	2	59.8	29.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	29
flowering dogwood	Cornus florida	WDL	Medium	42.3	58.8	1.9	No change	No change	Medium	Common	Fair	Fair			1	30
southern red oak	Quercus falcata	WDL	Medium	14.4	58.8	3.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	31
shellbark hickory	Carya laciniosa	NSL	Low	17.5	56.5	4.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	32
northern red oak	Quercus rubra	WDH	Medium	27.1	52.6	3.7	No change	No change	High	Common	Good	Good			1	33
scarlet oak	Quercus coccinea	WDL	Medium	17.5	50.5	2.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor		Infill +	0	34
American beech	Fagus grandifolia	WDH	High	23.7	39.8	2.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	35
eastern redbud	Cercis canadensis	NSL	Low	18.1	37.5	1.4	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
eastern cottonwood	Populus deltoides	NSH	Low	7.6	36.8	8.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
pawpaw	Asimina triloba	NSL	Low	11.4	36.8	3.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
chestnut oak	Quercus prinus	NDH	High	4.2	34.9	5.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	39
bitternut hickory	Carya cordiformis	WSL	Low	17.7	32.3	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
black walnut	Juglans nigra	WDH	Low	22.1	30.9	2.6	No change	No change	Medium	Rare	Poor	Poor			1	41
shingle oak	Quercus imbricaria	NDH	Medium	4.5	28.8	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
black willow	Salix nigra	NSH	Low	12.1	26.4	4.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	43
boxelder	Acer negundo	WSH	Low	22.9	26.2	3.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	44
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	9.6	25.1	3.3	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	45
pin oak	Quercus palustris	NSH	Low	11.4	24.8	4.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	46
red mulberry	Morus rubra	NSL	Low	22.9	23.6	1.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	47



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sourwood	Oxydendrum arboreum	NDL	High	4.3	22.9	3.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 48
shortleaf pine	Pinus echinata	WDH	High	0.3	20.2	5.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 49
white mulberry	Morus alba	NSL	FIA	1.9	16.9	3.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 50
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	11.1	16.5	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 51
sugarberry	Celtis laevigata	NDH	Medium	9.5	10.2	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1 52
swamp chestnut oak	Quercus michauxii	NSL	Low	8.2	8.6	1.9	No change	No change	Medium	Rare	Poor	Poor				0 53
Shumard oak	Quercus shumardii	NSL	Low	2.9	7.4	2.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good				2 54
pecan	Carya illinoensis	NSH	Low	9.6	7.3	2.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 55
honeylocust	Gleditsia triacanthos	NSH	Low	6.1	6.7	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			Infill ++	1 56
paulownia	Paulownia tomentosa	NSL	FIA	6.1	5.4	1.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 57
river birch	Betula nigra	NSL	Low	8.6	4.5	1.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			Infill +	1 58
overcup oak	Quercus lyrata	NSL	Medium	5.1	2.9	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 59
willow oak	Quercus phellos	NSL	Low	6.1	2.8	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 60
pumpkin ash	Fraxinus profunda	NSH	FIA	0.3	2.7	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 61
swamp white oak	Quercus bicolor	NSL	Low	3.5	2.3	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 62
water hickory	Carya aquatica	NSL	Medium	6.6	2.2	3.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor				0 63
bur oak	Quercus macrocarpa	NDH	Medium	2	2.1	0.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 64
northern catalpa	Catalpa speciosa	NSHX	FIA	3.2	1.4	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 65
eastern white pine	Pinus strobus	WDH	High	0.9	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0 66
mountain maple	Acer spicatum	NSL	Low	1	0.9	0.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 67
swamp tupelo	Nyssa biflora	NDH	Medium	1	0.2	0.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 68
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 69
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 70
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 71
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 72
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			Migrate ++	3 73
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 74
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 75
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 76
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 77
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 78
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 79
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 80
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 81
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 82
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 83
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 84
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 85