

**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	10,421	4,023.6	344

**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 RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85				
Ash	2			High	16	25	Increase	34	38	Very Good	16	17	Likely	0	0
Hickory	6			Medium	35	55	No Change	14	13	Good	16	19	Infill	13	12
Maple	4	Abundant	3	Low	36	9	Decrease	25	22	Fair	12	12	Migrate	3	5
Oak	19	Common	28	FIA	2		New	9	10	Poor	14	11		<b>16</b>	<b>17</b>
Pine	6	Rare	44				Unknown	7	6	Very Poor	14	13			
Other	38	Absent	13					<b>89</b>	<b>89</b>	FIA Only	2	2			
	<b>75</b>		<b>88</b>							Unknown	5	4			
											<b>79</b>	<b>78</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	63.9	65.6	67.6	67.7	
	CCSM85	63.9	65.9	68.4	71.0	
	GFDL45	63.9	66.6	68.4	69.2	
	GFDL85	63.9	66.4	69.5	72.9	
	HAD45	63.9	66.2	69.0	70.4	
	HAD85	63.9	66.4	70.5	74.4	
Growing Season May—Sep	CCSM45	77.2	78.8	80.5	81.0	
	CCSM85	77.2	78.9	81.6	84.8	
	GFDL45	77.2	80.0	81.8	83.3	
	GFDL85	77.2	79.7	83.1	87.1	
	HAD45	77.2	80.5	83.0	84.5	
	HAD85	77.2	80.5	86.4	89.8	
Coldest Month Average	CCSM45	43.8	46.1	46.9	46.7	
	CCSM85	43.8	46.2	47.5	48.6	
	GFDL45	43.8	47.5	47.7	47.8	
	GFDL85	43.8	45.7	46.9	47.2	
	HAD45	43.8	43.8	45.5	46.2	
	HAD85	43.8	45.1	46.3	48.0	
Warmest Month Average	CCSM45	81.3	82.9	83.7	83.8	
	CCSM85	81.3	82.9	84.3	86.2	
	GFDL45	81.3	84.2	84.8	85.7	
	GFDL85	81.3	83.6	85.1	87.3	
	HAD45	81.3	85.6	87.4	87.9	
	HAD85	81.3	85.9	89.7	91.0	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	53.7	55.2	60.6	59.0	
	CCSM85	53.7	56.7	58.4	64.5	
	GFDL45	53.7	60.3	64.1	65.5	
	GFDL85	53.7	59.9	62.5	63.7	
	HAD45	53.7	52.2	58.0	58.3	
	HAD85	53.7	56.7	51.7	54.7	
Growing Season May—Sep	CCSM45	20.8	21.5	23.3	22.7	
	CCSM85	20.8	20.4	21.3	23.2	
	GFDL45	20.8	25.4	27.5	26.8	
	GFDL85	20.8	26.1	28.2	29.0	
	HAD45	20.8	19.9	22.0	20.8	
	HAD85	20.8	22.1	16.9	17.9	

**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-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.

**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	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
loblolly pine	Pinus taeda	WDH	High	87.4	4368.5	35.2	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	87.4	1370.3	10.7	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	80.4	657.6	5.7	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
eastern redcedar	Juniperus virginiana	WDH	Medium	50.2	478.5	7.5	Sm. dec.	No change	Medium	Common	Poor	Fair			1	4
sugarberry	Celtis laevigata	NDH	Medium	40	359.9	6.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
green ash	Fraxinus pennsylvanica	WSH	Low	47.8	319.1	4.8	No change	Sm. inc.	Medium	Common	Fair	Good			1	6
red maple	Acer rubrum	WDH	High	63.3	258.0	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
yellow-poplar	Liriodendron tulipifera	WDH	High	50.5	241.0	3.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	8
longleaf pine	Pinus palustris	NSH	Medium	13.2	215.1	11.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
shortleaf pine	Pinus echinata	WDH	High	41.7	200.1	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
southern red oak	Quercus falcata	WDL	Medium	51.7	188.0	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
mockernut hickory	Carya alba	WDL	Medium	41.9	165.5	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
white oak	Quercus alba	WDH	Medium	41.4	158.0	2.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
winged elm	Ulmus alata	WDL	Medium	54.3	146.9	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
blackgum	Nyssa sylvatica	WDL	Medium	50.2	146.8	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
willow oak	Quercus phellos	NSL	Low	31.8	134.9	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	38.4	130.3	2.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	38.5	117.1	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
Osage-orange	Maclura pomifera	NDH	Medium	9.5	114.6	10.7	No change	No change	High	Common	Good	Good			1	19
laurel oak	Quercus laurifolia	NDH	Medium	28.5	108.0	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
pignut hickory	Carya glabra	WDL	Medium	32.9	96.4	1.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	21
boxelder	Acer negundo	WDH	Low	13.1	93.8	6.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	22
post oak	Quercus stellata	WDH	High	31.1	85.7	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
flowering dogwood	Cornus florida	WDL	Medium	37.6	83.7	1.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
sourwood	Oxydendrum arboreum	NDL	High	24.4	68.3	1.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	25
water tupelo	Nyssa aquatica	NSH	Medium	7.6	68.2	6.1	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	26
sweetbay	Magnolia virginiana	NSL	Medium	17.6	62.9	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
American elm	Ulmus americana	WDH	Medium	23.7	62.3	1.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
black cherry	Prunus serotina	WDL	Medium	30.8	59.1	1.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	29
American beech	Fagus grandifolia	WDH	High	24	55.9	1.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	30
common persimmon	Diospyros virginiana	NSL	Low	30.4	51.5	1.1	No change	No change	High	Common	Good	Good			1	31
swamp chestnut oak	Quercus michauxii	NSL	Low	17.8	48.7	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	32
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	26.3	47.2	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	33
river birch	Betula nigra	NSL	Low	8.9	47.1	3.8	No change	No change	Medium	Rare	Poor	Poor			1	34
shagbark hickory	Carya ovata	WSL	Medium	18.7	45.0	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
slippery elm	Ulmus rubra	WSL	Low	15.5	41.7	2.2	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	36
swamp tupelo	Nyssa biflora	NDH	Medium	5.7	38.8	6.7	No change	No change	Low	Rare	Very Poor	Very Poor			0	37
pecan	Carya illinoensis	NSH	Low	11	34.8	2.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	38
sycamore	Platanus occidentalis	NSL	Low	14.8	32.6	1.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	39
overcup oak	Quercus lyrata	NSL	Medium	9	32.2	2.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	40
red mulberry	Morus rubra	NSL	Low	17	30.9	1.3	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
durand oak	Quercus sinuata var. sinuata	NSL	FIA	9.1	29.5	2.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
honeylocust	Gleditsia triacanthos	NSH	Low	7.6	29.0	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	43
black willow	Salix nigra	NSH	Low	11.2	27.5	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	44
chestnut oak	Quercus prinus	NDH	High	5.5	27.0	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	45
bald cypress	Taxodium distichum	NSH	Medium	6.5	24.5	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	46
American holly	Ilex opaca	NSL	Medium	11	23.0	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	47



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eastern redbud	Cercis canadensis	NSL	Low	12.9	21.0	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	48
spruce pine	Pinus glabra	NSL	Low	9.2	20.7	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	49
florida maple	Acer barbatum	NSL	Low	15.6	19.7	0.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	50
Virginia pine	Pinus virginiana	NDH	High	2.4	18.6	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
black oak	Quercus velutina	WDH	High	9.9	17.1	1.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
white ash	Fraxinus americana	WDL	Medium	9.9	16.6	1.1	No change	No change	Low	Rare	Very Poor	Very Poor			0	53
Shumard oak	Quercus shumardii	NSL	Low	4.1	16.6	3.1	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	54
northern red oak	Quercus rubra	WDH	Medium	7.1	14.7	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	55
black walnut	Juglans nigra	WDH	Low	5.8	13.8	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
sassafras	Sassafras albidum	WSL	Low	11.8	13.0	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	57
scarlet oak	Quercus coccinea	WDL	Medium	4.1	11.3	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	58
blackjack oak	Quercus marilandica	NSL	Medium	6	11.2	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	59
southern magnolia	Magnolia grandiflora	NSL	Low	4.3	10.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	60
bitternut hickory	Carya cordiformis	WSL	Low	5.3	8.7	0.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	61
bigleaf magnolia	Magnolia macrophylla	NSL	Low	6.6	7.8	0.8	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
water hickory	Carya aquatica	NSL	Medium	2.2	6.8	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	63
cucumbertree	Magnolia acuminata	NSL	Low	5.8	6.5	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
turkey oak	Quercus laevis	NSH	Medium	3.8	4.5	1.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	65
slash pine	Pinus elliotii	NDH	High	1.6	3.5	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	66
eastern cottonwood	Populus deltoides	NSH	Low	1.2	2.0	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	67
redbay	Persea borbonia	NSL	Low	1.9	2.0	1.1	No change	Sm. inc.	High	Rare	Fair	Good			0	68
serviceberry	Amelanchier spp.	NSL	Low	1.9	1.7	0.9	No change	No change	Medium	Rare	Poor	Poor			0	69
American basswood	Tilia americana	WSL	Medium	1.1	1.6	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	70
hackberry	Celtis occidentalis	WDH	Medium	1	1.3	1.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	71
nuttall oak	Quercus texana	NSH	Medium	0.4	0.8	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			0	72
wild plum	Prunus americana	NSLX	FIA	1.9	0.7	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	73
live oak	Quercus virginiana	NDH	High	1	0.6	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	74
silver maple	Acer saccharinum	NSH	Low	1	0.3	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	75
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	76
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	77
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	80
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	82
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	83
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	84
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	85
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	86
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	87
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	88
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	89