

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

Area of Region      sq. km      sq. mi      FIA Plots  
 10,306      3,979.1      278

**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	18	23	Increase	26	33	Very Good	9	10	Likely	1	1
Hickory	7			Medium	28	49	No Change	17	9	Good	19	20	Infill	12	15
Maple	5	Abundant	4	Low	38	12	Decrease	24	25	Fair	7	11	Migrate	2	3
Oak	15	Common	19	FIA	4		New	9	9	Poor	14	8			
Pine	6	Rare	48				Unknown	12	12	Very Poor	16	15			
Other	36	Absent	16							FIA Only	1	1			
	<b>71</b>		<b>87</b>		<b>88</b>	<b>84</b>		<b>88</b>	<b>88</b>	Unknown	8	8			
											<b>74</b>	<b>73</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	61.4	63.2	65.2	65.3	
	CCSM85	61.4	63.5	65.9	68.6	
	GFDL45	61.4	64.3	66.2	66.9	
	GFDL85	61.4	64.1	67.3	70.9	
	HAD45	61.4	63.6	66.5	68.0	
	HAD85	61.4	63.9	68.1	72.0	
Growing Season (May—Sep)	CCSM45	74.8	76.5	78.3	78.7	
	CCSM85	74.8	76.6	79.2	82.7	
	GFDL45	74.8	78.0	79.9	81.1	
	GFDL85	74.8	77.8	81.4	85.5	
	HAD45	74.8	78.0	80.5	82.3	
	HAD85	74.8	77.9	84.0	87.6	
Coldest Month Average	CCSM45	41.5	43.9	44.7	44.6	
	CCSM85	41.5	43.8	44.9	46.1	
	GFDL45	41.5	44.6	44.8	45.2	
	GFDL85	41.5	43.2	44.3	44.6	
	HAD45	41.5	41.5	43.3	43.8	
	HAD85	41.5	42.7	43.8	45.4	
Warmest Month Average	CCSM45	79.4	81.4	82.2	82.2	
	CCSM85	79.4	81.4	82.8	84.8	
	GFDL45	79.4	82.3	83.1	83.9	
	GFDL85	79.4	82.4	84.1	86.3	
	HAD45	79.4	83.5	85.2	85.9	
	HAD85	79.4	83.7	87.5	89.3	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	49.3	51.5	54.9	55.3	
	CCSM85	49.3	52.4	55.3	61.7	
	GFDL45	49.3	54.9	58.0	61.8	
	GFDL85	49.3	54.7	58.5	59.1	
	HAD45	49.3	47.9	52.6	53.7	
	HAD85	49.3	53.8	48.4	52.4	
Growing Season (May—Sep)	CCSM45	20.1	21.7	23.4	24.0	
	CCSM85	20.1	21.8	22.5	24.9	
	GFDL45	20.1	24.8	27.0	27.9	
	GFDL85	20.1	24.3	27.4	28.2	
	HAD45	20.1	19.8	21.0	20.4	
	HAD85	20.1	22.1	17.0	18.4	

**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>.

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
loblolly pine	Pinus taeda	WDH	High	87.8	3428.5	31.0	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	89.7	1561.9	14.0	No change	No change	Medium	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	82.8	758.6	8.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
water oak	Quercus nigra	WDH	High	74.8	704.5	7.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	68.1	442.5	5.2	No change	No change	High	Common	Good	Good			1	5
red maple	Acer rubrum	WDH	High	68.8	388.5	4.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	6
southern red oak	Quercus falcata	WDL	Medium	60.1	264.9	3.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	7
mockernut hickory	Carya alba	WDL	Medium	36.9	252.1	5.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	56.6	166.3	2.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
black cherry	Prunus serotina	WDL	Medium	48	136.2	2.2	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	10
pignut hickory	Carya glabra	WDL	Medium	43.6	133.3	2.7	No change	No change	Medium	Common	Fair	Fair			1	11
post oak	Quercus stellata	WDH	High	42.4	123.0	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
shortleaf pine	Pinus echinata	WDH	High	47.3	122.6	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
green ash	Fraxinus pennsylvanica	WSH	Low	16.5	120.1	5.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	14
flowering dogwood	Cornus florida	WDL	Medium	54.6	115.2	1.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
scarlet oak	Quercus coccinea	WDL	Medium	25.8	93.9	3.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
boxelder	Acer negundo	WSH	Low	10	89.4	6.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	17
black oak	Quercus velutina	WDH	High	27.7	85.7	2.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	18
sourwood	Oxydendrum arboreum	NDL	High	42.3	77.4	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
northern red oak	Quercus rubra	WDH	Medium	27.1	72.1	2.4	No change	Sm. dec.	High	Common	Good	Fair			1	20
winged elm	Ulmus alata	WDL	Medium	22.8	63.8	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
swamp tupelo	Nyssa biflora	NDH	Medium	13.3	63.1	4.3	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	1	22
common persimmon	Diospyros virginiana	NSL	Low	27.1	51.0	1.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	23
chestnut oak	Quercus prinus	NDH	High	3.7	49.4	6.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	24
river birch	Betula nigra	NSL	Low	7.5	48.1	5.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	25
willow oak	Quercus phellos	NSL	Low	10.8	38.2	3.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	26
sweetbay	Magnolia virginiana	NSL	Medium	3.9	36.2	9.3	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	27
American beech	Fagus grandifolia	WDH	High	13.8	36.0	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	28
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	7.9	34.9	3.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	29
florida maple	Acer barbatum	NSL	Low	17.2	33.2	2.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	20.5	32.8	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
black willow	Salix nigra	NSH	Low	5.8	32.0	5.5	No change	Sm. inc.	Low	Rare	Very Poor	Poor			1	32
Virginia pine	Pinus virginiana	NDH	High	5	30.9	5.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	33
eastern redcedar	Juniperus virginiana	WDH	Medium	15.9	28.0	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	34
red mulberry	Morus rubra	NSL	Low	13.6	26.2	1.7	No change	Lg. inc.	Medium	Rare	Poor	Good			1	35
longleaf pine	Pinus palustris	NSH	Medium	2.8	25.9	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	36
blackjack oak	Quercus marilandica	NSL	Medium	2.7	24.5	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	37
sugar maple	Acer saccharum	WDH	High	1	20.3	20.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	38
American elm	Ulmus americana	WDH	Medium	12	19.8	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	39
pecan	Carya illinoensis	NSH	Low	4.9	14.6	3.0	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	40
sassafras	Sassafras albidum	WSL	Low	9.7	13.3	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	41
southern magnolia	Magnolia grandiflora	NSL	Low	5.8	12.0	5.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	42
sycamore	Platanus occidentalis	NSL	Low	3.9	10.7	1.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	43
swamp chestnut oak	Quercus michauxii	NSL	Low	2.9	10.3	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	44
sugarberry	Celtis laevigata	NDH	Medium	2.9	9.3	3.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	45
laurel oak	Quercus laurifolia	NDH	Medium	2.8	9.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	46
black walnut	Juglans nigra	WDH	Low	1.9	9.0	4.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American holly	Ilex opaca	NSL	Medium	4.7	8.8	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	48
bitternut hickory	Carya cordiformis	WSL	Low	1	7.4	7.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	49
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	8.6	5.9	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	50
white ash	Fraxinus americana	WDL	Medium	2.9	5.1	1.8	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	51
slippery elm	Ulmus rubra	WSL	Low	3.5	4.9	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
paulownia	Paulownia tomentosa	NSL	FIA	1	4.9	5.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
slash pine	Pinus elliotii	NDH	High	1.5	4.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
ailanthus	Ailanthus altissima	NSL	FIA	1	4.1	4.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	55
overcup oak	Quercus lyrata	NSL	Medium	1.8	3.4	1.7	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	56
sand hickory	Carya pallida	NSL	FIA	1	3.3	3.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	57
American basswood	Tilia americana	WSL	Medium	1	3.3	3.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
eastern redbud	Cercis canadensis	NSL	Low	3.9	2.5	0.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	1	59
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	1	2.5	2.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	60
eastern cottonwood	Populus deltoides	NSH	Low	0.8	2.4	2.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	61
black locust	Robinia pseudoacacia	NDH	Low	1	1.7	1.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	62
bigleaf magnolia	Magnolia macrophylla	NSL	Low	1	1.5	1.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	63
shagbark hickory	Carya ovata	WSL	Medium	1.6	1.2	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	64
silver maple	Acer saccharinum	NSH	Low	1	1.1	1.2	Sm. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	65
shellbark hickory	Carya laciniosa	NSL	Low	1	0.9	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
silverbell	Halesia spp.	NSL	Low	1	0.9	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	67
white mulberry	Morus alba	NSL	FIA	1	0.7	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	68
spruce pine	Pinus glabra	NSL	Low	1	0.4	0.4	No change	Lg. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	69
swamp white oak	Quercus bicolor	NSL	Low	1	0.4	0.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	70
yellow birch	Betula alleghaniensis	NDL	High	1	0.3	0.3	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	71
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	72
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	75
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	80
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	81
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	82
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	83
nuttall oak	Quercus texana	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	84
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	86
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	87
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	88