

**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	10,533	4,066.9	415

**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	25	Increase	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	2			Medium	35	No Change	13	15	Good	17	21	Likely	2	2
Hickory	8			Low	40	Decrease	29	25	Fair	10	8	Infill	10	16
Maple	3	Abundant	5	FIA	6	New	7	8	Poor	15	15	Migrate	0	1
Oak	19	Common	20			Unknown	12	11	Very Poor	19	17		<b>12</b>	<b>19</b>
Pine	6	Rare	57						FIA Only	5	5			
Other	44	Absent	12						Unknown	6	5			
	<b>82</b>		<b>94</b>				<b>95</b>	<b>95</b>		<b>85</b>	<b>84</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	65.0	66.7	68.5	68.6	
Average	CCSM85	65.0	66.9	69.4	71.8	
	GFDL45	65.0	67.7	69.4	70.2	
	GFDL85	65.0	67.4	70.5	73.8	
	HAD45	65.0	67.3	70.0	71.3	
	HAD85	65.0	67.5	71.3	75.1	
Growing	CCSM45	77.7	79.1	80.6	81.0	
Season	CCSM85	77.7	79.2	81.7	84.6	
May—Sep	GFDL45	77.7	80.4	82.0	83.5	
	GFDL85	77.7	80.1	83.2	87.2	
	HAD45	77.7	80.7	83.2	84.4	
	HAD85	77.7	80.8	86.1	89.5	
Coldest	CCSM45	45.8	48.1	48.9	48.7	
Month	CCSM85	45.8	48.3	49.5	50.6	
Average	GFDL45	45.8	49.5	49.6	49.7	
	GFDL85	45.8	47.5	48.6	49.1	
	HAD45	45.8	45.9	47.6	48.4	
	HAD85	45.8	47.2	48.5	50.2	
Warmest	CCSM45	81.2	82.6	83.2	83.3	
Month	CCSM85	81.2	82.6	83.8	85.5	
Average	GFDL45	81.2	84.2	84.7	85.6	
	GFDL85	81.2	83.4	84.8	86.9	
	HAD45	81.2	85.2	86.8	87.3	
	HAD85	81.2	85.6	88.9	90.1	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	58.7	61.1	66.6	65.0	
Total	CCSM85	58.7	62.7	63.6	69.4	
	GFDL45	58.7	65.4	69.6	69.1	
	GFDL85	58.7	64.9	66.9	68.3	
	HAD45	58.7	57.7	62.5	63.4	
	HAD85	58.7	63.3	56.6	59.0	
Growing	CCSM45	23.9	25.2	26.8	26.3	
Season	CCSM85	23.9	23.4	24.5	26.4	
May—Sep	GFDL45	23.9	28.7	31.7	29.7	
	GFDL85	23.9	29.3	31.7	32.8	
	HAD45	23.9	23.0	24.9	24.7	
	HAD85	23.9	25.4	19.6	20.3	

**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	SSO	N
loblolly pine	Pinus taeda	WDH	High	96.6	4068.1	31.3	No change	No change	Medium	Abundant	Good	Good			1	1
slash pine	Pinus elliottii	NDH	High	56.9	1029.1	13.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
water oak	Quercus nigra	WDH	High	95.2	842.6	6.3	Sm. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
sweetgum	Liquidambar styraciflua	WDH	High	90.7	827.3	6.6	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	60	586.9	6.9	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	5
sweetbay	Magnolia virginiana	NSL	Medium	67.2	446.0	4.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
blackgum	Nyssa sylvatica	WDL	Medium	86.7	381.7	3.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
red maple	Acer rubrum	WDH	High	86.7	354.4	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
shortleaf pine	Pinus echinata	WDH	High	47.2	277.2	4.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	9
southern red oak	Quercus falcata	WDL	Medium	71	252.1	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
yellow-poplar	Liriodendron tulipifera	WDH	High	53.1	223.3	2.8	No change	Sm. dec.	High	Common	Good	Fair			1	11
laurel oak	Quercus laurifolia	NDH	Medium	59.6	202.6	2.6	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	12
American holly	Ilex opaca	NSL	Medium	61.6	200.8	2.6	No change	No change	Medium	Common	Fair	Fair			1	13
swamp tupelo	Nyssa biflora	NDH	Medium	25.9	153.1	2.7	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	14
flowering dogwood	Cornus florida	WDL	Medium	68.8	135.7	1.5	No change	No change	Medium	Common	Fair	Fair			1	15
post oak	Quercus stellata	WDH	High	55.8	130.9	1.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	32.5	113.2	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
white oak	Quercus alba	WDH	Medium	41.7	110.9	2.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
water tupelo	Nyssa aquatica	NSH	Medium	6.2	81.9	6.7	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	19
black cherry	Prunus serotina	WDL	Medium	47.2	81.2	1.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	20
green ash	Fraxinus pennsylvanica	WSH	Low	19.8	70.2	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
spruce pine	Pinus glabra	NSL	Low	26.8	67.2	1.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	22
turkey oak	Quercus laevis	NSH	Medium	13	54.8	2.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	23
eastern redcedar	Juniperus virginiana	WDH	Medium	19	54.0	2.3	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	24
willow oak	Quercus phellos	NSL	Low	23.1	53.6	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
swamp chestnut oak	Quercus michauxii	NSL	Low	15.6	49.4	2.4	Sm. inc.	No change	Medium	Rare	Fair	Poor			1	26
bald cypress	Taxodium distichum	NSH	Medium	12.9	44.6	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
overcup oak	Quercus lyrata	NSL	Medium	6.3	40.7	4.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	28
sugarberry	Celtis laevigata	NDH	Medium	10.8	35.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	29
southern magnolia	Magnolia grandiflora	NSL	Low	16.5	34.8	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
redbay	Persea borbonia	NSL	Low	23.4	33.3	0.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	31
American beech	Fagus grandifolia	WDH	High	14.3	33.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
sourwood	Oxydendrum arboreum	NDL	High	20.1	31.8	1.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	33
mockernut hickory	Carya alba	WDL	Medium	27.1	30.6	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
sycamore	Platanus occidentalis	NSL	Low	6.9	29.9	2.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	35
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.4	29.4	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	36
winged elm	Ulmus alata	WDL	Medium	17.1	29.0	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	37
pecan	Carya illinoensis	NSH	Low	2.1	28.9	2.5	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	38
common persimmon	Diospyros virginiana	NSL	Low	33.3	28.8	0.7	Sm. dec.	No change	High	Rare	Poor	Fair			1	39
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	17.3	28.0	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
water hickory	Carya aquatica	NSL	Medium	5.6	27.0	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	41
black willow	Salix nigra	NSH	Low	5.6	26.2	2.3	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	42
blackjack oak	Quercus marilandica	NSL	Medium	17.8	23.6	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	43
pignut hickory	Carya glabra	WDL	Medium	21.7	21.2	0.9	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	44
red mulberry	Morus rubra	NSL	Low	6	20.9	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
American elm	Ulmus americana	WDH	Medium	10.5	19.2	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	46
sassafras	Sassafras albidum	WSL	Low	22.7	15.4	0.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
Shumard oak	Quercus shumardii	NSL	Low	4.8	14.4	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 48
pond cypress	Taxodium ascendens	NSH	Medium	1.6	13.5	6.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +		2 49
black oak	Quercus velutina	WDH	High	9.5	13.4	1.2	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 50
white ash	Fraxinus americana	WDL	Medium	4.7	12.9	2.7	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor				2 51
bigleaf magnolia	Magnolia macrophylla	NSL	Low	6.9	10.9	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 52
boxelder	Acer negundo	WSH	Low	4	9.9	1.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +		2 53
river birch	Betula nigra	NSL	Low	2.8	9.7	2.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++		1 54
eastern redbud	Cercis canadensis	NSL	Low	3.7	5.9	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 55
shagbark hickory	Carya ovata	WSL	Medium	1.9	5.4	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 56
bitternut hickory	Carya cordiformis	WSL	Low	1.1	5.4	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +		2 57
florida maple	Acer barbatum	NSL	Low	4.3	4.8	0.9	No change	No change	High	Rare	Fair	Fair				0 58
bluejack oak	Quercus incana	NSL	Low	5	4.6	0.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 59
eastern cottonwood	Populus deltoides	NSH	Low	0.5	4.1	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 60
nuttall oak	Quercus texana	NSH	Medium	1.8	3.9	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 61
serviceberry	Amelanchier spp.	NSL	Low	0.9	3.8	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 62
black hickory	Carya texana	NDL	High	3.7	2.9	0.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good				2 63
black walnut	Juglans nigra	WDH	Low	3	2.9	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 64
slippery elm	Ulmus rubra	WSL	Low	2.4	2.9	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 65
water elm	Planera aquatica	NSL	Low	1.8	2.8	1.3	No change	No change	Medium	Rare	Poor	Poor		Infill +		2 66
live oak	Quercus virginiana	NDH	High	1.2	2.7	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 67
cucumbertree	Magnolia acuminata	NSL	Low	2.5	2.5	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 68
waterlocust	Gleditsia aquatica	NSLX	FIA	0.5	1.8	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 69
cedar elm	Ulmus crassifolia	NDH	Medium	0.9	1.8	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +		2 70
northern red oak	Quercus rubra	WDH	Medium	0.9	1.7	1.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 71
chokecherry	Prunus virginiana	NSLX	FIA	0.1	1.5	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 72
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.6	1.2	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 73
hackberry	Celtis occidentalis	WDH	Medium	1	1.1	0.3	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0 74
scarlet oak	Quercus coccinea	WDL	Medium	1.7	1.1	0.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 75
sand hickory	Carya pallida	NSL	FIA	0.9	0.9	1.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 76
wild plum	Prunus americana	NSLX	FIA	1.5	0.4	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 77
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.9	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 78
paulownia	Paulownia tomentosa	NSL	FIA	0.1	0.4	0.0	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 79
Virginia pine	Pinus virginiana	NDH	High	0.9	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 80
black locust	Robinia pseudoacacia	NDH	Low	0.4	0.2	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 81
pawpaw	Asimina triloba	NSL	Low	0.6	0.2	0.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 82
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +		3 83
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 84
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 85
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 86
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 87
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 88
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 89
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 90
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 91
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 92
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 93
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 94

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 95