

**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	8,524.1	3,291.2	196

**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	3			High	23	22	Increase	16	19	Very Good	6	6	Likely	0	0
Hickory	5			Medium	33	50	No Change	15	13	Good	11	13	Infill	3	6
Maple	4	Abundant	5	Low	31	17	Decrease	20	19	Fair	10	9	Migrate	10	17
Oak	8	Common	19	FIA	7		New	29	31	Poor	9	10		13	23
Pine	2	Rare	34				Unknown	14	12	Very Poor	14	11			
Other	36	Absent	34							FIA Only	2	2			
	<b>58</b>		<b>92</b>		<b>94</b>	<b>89</b>		<b>94</b>	<b>94</b>	Unknown	7	5			
											<b>59</b>	<b>56</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.5	51.4	53.5	53.8	
	CCSM85	49.5	51.8	54.3	57.4	
	GFDL45	49.5	52.7	55.3	56.4	
	GFDL85	49.5	52.7	56.5	60.7	
	HAD45	49.5	52.0	55.4	57.1	
	HAD85	49.5	52.0	56.3	61.1	
Growing Season (May—Sep)	CCSM45	66.0	68.1	69.8	70.3	
	CCSM85	66.0	68.3	70.8	74.5	
	GFDL45	66.0	69.5	72.5	73.8	
	GFDL85	66.0	69.7	73.9	78.2	
	HAD45	66.0	68.8	71.8	73.9	
	HAD85	66.0	68.1	72.8	77.9	
Coldest Month Average	CCSM45	24.3	25.9	27.6	28.2	
	CCSM85	24.3	26.9	28.0	30.1	
	GFDL45	24.3	27.8	29.1	30.0	
	GFDL85	24.3	27.8	29.4	31.5	
	HAD45	24.3	25.9	28.5	28.8	
	HAD85	24.3	26.9	29.1	32.0	
Warmest Month Average	CCSM45	72.2	74.6	75.6	75.7	
	CCSM85	72.2	74.9	76.4	78.3	
	GFDL45	72.2	75.0	76.9	78.0	
	GFDL85	72.2	76.1	78.6	81.2	
	HAD45	72.2	75.2	76.6	77.7	
	HAD85	72.2	74.6	76.9	80.4	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	49.0	49.9	49.5	54.6	
	CCSM85	49.0	50.5	53.5	56.5	
	GFDL45	49.0	54.3	58.1	55.9	
	GFDL85	49.0	52.6	56.1	59.8	
	HAD45	49.0	50.2	52.7	52.6	
	HAD85	49.0	53.3	52.9	55.6	
Growing Season (May—Sep)	CCSM45	21.6	24.5	23.3	25.4	
	CCSM85	21.6	23.0	25.0	24.6	
	GFDL45	21.6	22.4	22.6	23.6	
	GFDL85	21.6	22.1	22.7	23.7	
	HAD45	21.6	22.3	21.3	21.6	
	HAD85	21.6	22.3	21.5	22.3	

**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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	87.6	1917.7	17.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
northern red oak	Quercus rubra	WDH	Medium	71.6	931.7	11.8	No change	Sm. dec.	High	Abundant	Very Good	Good			1	2
sweet birch	Betula lenta	NDH	High	73.9	881.4	10.2	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	3
sugar maple	Acer saccharum	WDH	High	71.7	864.4	11.1	No change	No change	High	Abundant	Very Good	Very Good			1	4
white ash	Fraxinus americana	WDL	Medium	64.6	676.6	9.8	No change	No change	Low	Abundant	Fair	Fair			0	5
black oak	Quercus velutina	WDH	High	52.9	485.2	8.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
eastern hemlock	Tsuga canadensis	NSH	High	31.7	380.9	8.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	7
chestnut oak	Quercus prinus	NDH	High	30.9	356.4	9.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
black cherry	Prunus serotina	WDL	Medium	49.2	344.5	6.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
eastern white pine	Pinus strobus	WDH	High	19.5	242.6	9.3	No change	Sm. dec.	Low	Common	Poor	Poor			0	10
American elm	Ulmus americana	WDH	Medium	38.7	242.6	5.1	No change	No change	Medium	Common	Fair	Fair			1	11
American beech	Fagus grandifolia	WDH	High	46.4	239.7	4.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
yellow birch	Betula alleghaniensis	NDL	High	34.5	234.4	5.5	No change	No change	Medium	Common	Fair	Fair			1	13
white oak	Quercus alba	WDH	Medium	40.6	183.7	3.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
pignut hickory	Carya glabra	WDL	Medium	45	170.5	3.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
shagbark hickory	Carya ovata	WSL	Medium	31.9	157.0	4.1	No change	No change	Medium	Common	Fair	Fair			1	16
black locust	Robinia pseudoacacia	NDH	Low	15.1	153.3	7.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
scarlet oak	Quercus coccinea	WDL	Medium	20.8	139.5	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
swamp white oak	Quercus bicolor	NSL	Low	12.2	104.7	6.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
green ash	Fraxinus pennsylvanica	WSH	Low	9.7	104.7	8.1	No change	No change	Medium	Common	Fair	Fair			1	20
yellow-poplar	Liriodendron tulipifera	WDH	High	22	86.2	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
Norway maple	Acer platanoides	NSL	FIA	15	81.6	5.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	22
eastern redcedar	Juniperus virginiana	WDH	Medium	18.4	71.8	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
American basswood	Tilia americana	WSL	Medium	7.2	71.2	7.2	No change	No change	Medium	Common	Fair	Fair			1	24
paper birch	Betula papyrifera	WDH	High	10	49.3	2.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
eastern cottonwood	Populus deltoides	NSH	Low	0.6	44.6	8.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	26
bigtooth aspen	Populus grandidentata	NSL	Medium	8.5	44.4	2.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
sassafras	Sassafras albidum	WSL	Low	8.3	43.5	3.5	Sm. inc.	No change	Medium	Rare	Fair	Poor			1	28
Scots pine	Pinus sylvestris	NSH	FIA	2.3	42.2	18.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
black ash	Fraxinus nigra	WSH	Medium	7	40.8	5.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	30
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.3	37.4	1.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	31
serviceberry	Amelanchier spp.	NSL	Low	18.7	36.5	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
blackgum	Nyssa sylvatica	WDL	Medium	6.2	34.6	4.4	No change	Sm. inc.	High	Rare	Fair	Good			1	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	15.6	33.1	1.7	No change	Lg. inc.	Medium	Rare	Poor	Good			1	34
bitternut hickory	Carya cordiformis	WSL	Low	13.7	29.4	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	35
quaking aspen	Populus tremuloides	WDH	High	5.2	28.4	4.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
sycamore	Platanus occidentalis	NSL	Low	1.2	27.1	23.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	37
ailanthus	Ailanthus altissima	NSL	FIA	12	24.2	2.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
mockernut hickory	Carya alba	WDL	Medium	6	24.2	2.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	39
butternut	Juglans cinerea	NSLX	FIA	2.3	16.9	7.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	40
Norway spruce	Picea abies	NSH	FIA	4	16.3	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
river birch	Betula nigra	NSL	Low	0.2	12.6	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
pin oak	Quercus palustris	NSH	Low	5.2	12.0	3.2	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	43
flowering dogwood	Cornus florida	WDL	Medium	9.1	9.4	0.9	No change	No change	Medium	Rare	Poor	Poor			1	44
gray birch	Betula populifolia	NSL	Low	8.3	8.8	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
striped maple	Acer pensylvanicum	NSL	Medium	6.7	8.1	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
black walnut	Juglans nigra	WDH	Low	3.2	5.6	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	47



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pin cherry	Prunus pensylvanica	NSL	Low	2.3	4.9	2.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 48
hackberry	Celtis occidentalis	WDH	Medium	1.2	3.4	2.9	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2 49
red spruce	Picea rubens	NDH	High	1.6	2.5	0.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 50
black willow	Salix nigra	NSH	Low	1.2	2.2	1.9	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor				2 51
American chestnut	Castanea dentata	NSLX	FIA	2.3	2.2	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 52
sweetgum	Liquidambar styraciflua	WDH	High	1.2	1.9	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 53
slippery elm	Ulmus rubra	WSL	Low	2.3	1.8	0.8	Lg. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +		2 54
white mulberry	Morus alba	NSL	FIA	0.5	1.4	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 55
northern pin oak	Quercus ellipsoidalis	NSH	Medium	3.9	1.1	3.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 56
shellbark hickory	Carya laciniosa	NSL	Low	0.8	0.8	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 57
tamarack (native)	Larix laricina	NSH	High	1.1	0.3	0.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 58
white spruce	Picea glauca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 59
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 60
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 61
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 62
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 63
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 64
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 65
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 66
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 67
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 68
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0 69
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 71
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 72
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 73
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 74
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 75
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 76
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 78
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 79
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 80
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 81
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 82
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 83
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 84
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 85
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 86
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 87
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +		3 88
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 89
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 90
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 91
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 92
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 93
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 94

