

**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	10,188	3,933.4	310

**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	24	Increase	24	31	Very Good	14	15	Likely	4	4
Hickory	7			Medium	31	52	No Change	14	11	Good	11	16	Infill	11	14
Maple	5	Abundant	5	Low	36	17	Decrease	29	25	Fair	10	9	Migrate	3	9
Oak	15	Common	27	FIA	7		New	15	17	Poor	17	14			
Pine	4	Rare	42				Unknown	15	13	Very Poor	15	12			
Other	40	Absent	23							FIA Only	4	4			
	<b>74</b>		<b>97</b>		<b>97</b>	<b>93</b>		<b>97</b>	<b>97</b>	Unknown	8	6			
											<b>79</b>	<b>76</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.2	61.0	63.1	63.2	
	CCSM85	59.2	61.3	63.8	66.5	
	GFDL45	59.2	61.9	64.0	64.7	
	GFDL85	59.2	61.8	65.1	68.6	
	HAD45	59.2	61.4	64.4	65.8	
Growing Season (May—Sep)	CCSM45	73.3	75.0	76.9	77.3	
	CCSM85	73.3	75.2	77.8	81.3	
	GFDL45	73.3	76.2	78.5	79.9	
	GFDL85	73.3	76.1	80.0	84.0	
	HAD45	73.3	76.5	79.2	80.7	
Coldest Month (Average)	CCSM45	38.0	40.2	41.2	41.2	
	CCSM85	38.0	40.7	41.7	42.9	
	GFDL45	38.0	41.4	41.4	41.8	
	GFDL85	38.0	39.8	40.9	41.3	
	HAD45	38.0	37.7	39.8	40.2	
Warmest Month (Average)	CCSM45	78.2	80.0	80.9	81.0	
	CCSM85	78.2	80.1	81.7	83.5	
	GFDL45	78.2	80.8	82.1	83.0	
	GFDL85	78.2	81.0	83.2	85.2	
	HAD45	78.2	82.4	84.5	85.1	
HAD85	78.2	82.9	87.3	88.7		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	53.4	56.1	59.3	58.6	
	CCSM85	53.4	57.1	58.9	64.7	
	GFDL45	53.4	60.8	63.1	67.2	
	GFDL85	53.4	60.4	63.4	66.0	
	HAD45	53.4	51.6	57.4	58.4	
Growing Season (May—Sep)	CCSM45	20.6	21.5	22.0	22.6	
	CCSM85	20.6	21.3	20.9	23.1	
	GFDL45	20.6	25.3	26.4	27.2	
	GFDL85	20.6	24.9	26.9	28.0	
	HAD45	20.6	19.7	21.2	20.7	
HAD85	20.6	22.1	16.1	18.5		

**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	72.1	1993.1	21.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
chestnut oak	Quercus prinus	NDH	High	64.6	1147.2	12.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
Virginia pine	Pinus virginiana	NDH	High	68.8	771.4	9.4	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
sweetgum	Liquidambar styraciflua	WDH	High	65.2	568.6	7.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
white oak	Quercus alba	WDH	Medium	71.5	538.5	6.0	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
red maple	Acer rubrum	WDH	High	74.8	494.8	5.1	No change	No change	High	Common	Good	Good			1	6
yellow-poplar	Liriodendron tulipifera	WDH	High	54.2	484.4	6.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	7
shortleaf pine	Pinus echinata	WDH	High	66.3	410.5	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
moccenut hickory	Carya alba	WDL	Medium	63.9	354.5	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
pignut hickory	Carya glabra	WDL	Medium	71.3	343.8	4.0	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
southern red oak	Quercus falcata	WDL	Medium	50.1	333.4	5.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
scarlet oak	Quercus coccinea	WDL	Medium	50.7	276.8	4.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
black oak	Quercus velutina	WDH	High	55.4	246.6	3.2	No change	No change	Medium	Common	Fair	Fair			1	13
black cherry	Prunus serotina	WDL	Medium	65.1	246.5	3.2	No change	Sm. inc.	Low	Common	Poor	Fair			1	14
blackgum	Nyssa sylvatica	WDL	Medium	71.4	236.8	2.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
eastern redcedar	Juniperus virginiana	WDH	Medium	28.1	227.5	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
post oak	Quercus stellata	WDH	High	51.9	213.6	3.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
sourwood	Oxydendrum arboreum	NDL	High	54.9	212.5	2.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	18
northern red oak	Quercus rubra	WDH	Medium	49.7	167.7	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
water oak	Quercus nigra	WDH	High	33.4	162.8	3.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
winged elm	Ulmus alata	WDL	Medium	41	139.6	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
green ash	Fraxinus pennsylvanica	WSH	Low	28.6	118.7	2.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	22
flowering dogwood	Cornus florida	WDL	Medium	54.2	113.3	1.7	No change	Sm. inc.	Medium	Common	Fair	Good			1	23
red mulberry	Morus rubra	NSL	Low	2.9	99.2	33.7	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
sassafras	Sassafras albidum	WSL	Low	32.9	93.8	2.4	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	25
black walnut	Juglans nigra	WDH	Low	12.6	83.2	5.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	26
shagbark hickory	Carya ovata	WSL	Medium	22.2	75.4	1.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
common persimmon	Diospyros virginiana	NSL	Low	27.9	68.5	1.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
boxelder	Acer negundo	WSH	Low	8.2	64.2	6.0	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	29
florida maple	Acer barbatum	NSL	Low	21.9	59.7	1.8	Sm. dec.	No change	High	Common	Fair	Good			1	30
white ash	Fraxinus americana	WDL	Medium	16.8	59.7	2.0	No change	Sm. inc.	Low	Common	Poor	Fair			1	31
blackjack oak	Quercus marilandica	NSL	Medium	15.5	52.8	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
chinkapin oak	Quercus muehlenbergii	NSL	Medium	9.1	48.2	2.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	33
sycamore	Platanus occidentalis	NSL	Low	8.5	38.5	3.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
hackberry	Celtis occidentalis	WDH	Medium	4.8	36.8	6.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	35
longleaf pine	Pinus palustris	NSH	Medium	4.9	30.7	6.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	36
silver maple	Acer saccharinum	NSH	Low	1.2	29.9	3.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	37
eastern redbud	Cercis canadensis	NSL	Low	17.5	28.9	1.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	38
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	8	27.7	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	39
willow oak	Quercus phellos	NSL	Low	4.9	27.2	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	40
sugarberry	Celtis laevigata	NDH	Medium	9.3	26.6	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
American beech	Fagus grandifolia	WDH	High	10.9	26.4	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	42
American elm	Ulmus americana	WDH	Medium	15.1	24.4	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	43
sugar maple	Acer saccharum	WDH	High	5.6	22.9	1.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
swamp tupelo	Nyssa biflora	NDH	Medium	1.6	22.1	9.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	45
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	12.5	20.6	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	46
river birch	Betula nigra	NSL	Low	1	17.4	17.7	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	47

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honeylocust	Gleditsia triacanthos	NSH	Low	4.6	16.8	2.1	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	48
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	6.1	15.6	2.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	49
water tupelo	Nyssa aquatica	NSH	Medium	0.3	13.7	4.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
American basswood	Tilia americana	WSL	Medium	3	12.4	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
slippery elm	Ulmus rubra	WSL	Low	5.5	11.5	1.0	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	52
shellbark hickory	Carya laciniosa	NSL	Low	2.1	8.0	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
paulownia	Paulownia tomentosa	NSL	FIA	1.5	7.8	3.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
black locust	Robinia pseudoacacia	NDH	Low	5.1	7.6	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	55
swamp chestnut oak	Quercus michauxii	NSL	Low	3.6	7.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
ailanthus	Ailanthus altissima	NSL	FIA	2	6.7	3.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	57
sand hickory	Carya pallida	NSL	FIA	2.9	5.2	1.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	58
black willow	Salix nigra	NSH	Low	2.4	4.8	0.7	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	59
serviceberry	Amelanchier spp.	NSL	Low	4.1	4.5	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	60
bitternut hickory	Carya cordiformis	WSL	Low	2.3	4.1	1.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	61
sweet birch	Betula lenta	NDH	High	2	4.1	2.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	62
laurel oak	Quercus laurifolia	NDH	Medium	2.6	3.3	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	63
blue ash	Fraxinus quadrangulata	NSL	Low	0.1	2.9	0.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	64
pin cherry	Prunus pensylvanica	NSL	Low	2	2.8	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
yellow buckeye	Aesculus flava	NSL	Low	1.5	2.7	0.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	66
sweetbay	Magnolia virginiana	NSL	Medium	0.7	1.7	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	67
butternut	Juglans cinerea	NSLX	FIA	2.5	1.6	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	68
Shumard oak	Quercus shumardii	NSL	Low	1	1.5	1.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	69
wild plum	Prunus americana	NSLX	FIA	1	1.2	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	70
white mulberry	Morus alba	NSL	FIA	0.7	0.7	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	71
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0.6	0.7	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	72
rock elm	Ulmus thomasii	NSLX	FIA	0.4	0.7	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	73
water hickory	Carya aquatica	NSL	Medium	0.7	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	74
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	75
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	76
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	77
eastern white pine	Pinus strobus	WDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
eastern hemlock	Tsuga canadensis	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	81
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	82
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	85
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	86
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	87
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	88
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	89
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	90
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	91
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	92
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	93
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	94



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live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	95
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	96
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	97