

**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  
 10,066    3,886.5    304

**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	20	Increase	23	26	Very Good	14	17	Likely	3	3
Hickory	7			Medium	32	No Change	12	14	Good	13	13	Infill	6	8
Maple	4	Abundant	5	Low	36	Decrease	27	22	Fair	11	10	Migrate	5	10
Oak	13	Common	34	FIA	6	New	19	19	Poor	11	10			
Pine	4	Rare	29			Unknown	13	13	Very Poor	13	12			
Other	37	Absent	25						FIA Only	2	2			
	<b>68</b>		<b>93</b>				<b>94</b>	<b>94</b>	Unknown	7	7			
										<b>71</b>	<b>71</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	58.4	60.1	62.4	62.6
	CCSM85	58.4	60.5	63.2	66.0
	GFDL45	58.4	61.0	63.2	64.0
	GFDL85	58.4	61.0	64.2	67.7
	HAD45	58.4	60.9	64.0	65.3
	HAD85	58.4	61.3	65.8	69.6
Growing Season May—Sep	CCSM45	73.0	74.6	76.6	77.1
	CCSM85	73.0	75.0	77.8	81.5
	GFDL45	73.0	76.0	78.4	79.8
	GFDL85	73.0	76.0	79.9	83.9
	HAD45	73.0	76.4	79.4	80.9
	HAD85	73.0	76.7	83.3	86.8
Coldest Month Average	CCSM45	36.0	38.1	39.4	39.6
	CCSM85	36.0	39.1	40.2	41.8
	GFDL45	36.0	39.5	39.5	39.9
	GFDL85	36.0	37.5	38.8	39.2
	HAD45	36.0	36.5	38.7	39.1
	HAD85	36.0	37.6	39.3	41.0
Warmest Month Average	CCSM45	78.1	79.5	80.6	80.7
	CCSM85	78.1	79.9	81.4	83.3
	GFDL45	78.1	81.4	82.5	83.4
	GFDL85	78.1	81.2	83.3	85.5
	HAD45	78.1	82.6	85.2	85.7
	HAD85	78.1	83.7	88.3	89.6

**Precipitation (in)**

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	55.9	57.3	62.7	60.7
	CCSM85	55.9	60.9	61.6	66.2
	GFDL45	55.9	63.5	66.7	69.7
	GFDL85	55.9	63.9	67.3	71.1
	HAD45	55.9	52.6	58.4	58.3
	HAD85	55.9	55.6	51.3	56.6
Growing Season May—Sep	CCSM45	22.5	21.6	22.5	22.3
	CCSM85	22.5	22.8	21.0	23.1
	GFDL45	22.5	26.1	27.0	27.9
	GFDL85	22.5	26.8	27.8	28.9
	HAD45	22.5	20.5	21.1	20.3
	HAD85	22.5	21.7	16.4	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.

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
white oak	Quercus alba	WDH	Medium	84.4	1625.0	14.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	78.3	873.4	9.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
pignut hickory	Carya glabra	WDL	Medium	81.6	652.5	6.0	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
loblolly pine	Pinus taeda	WDH	High	28	585.4	16.7	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	4
chestnut oak	Quercus prinus	NDH	High	54.5	582.5	8.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	5
sourwood	Oxydendrum arboreum	NDL	High	69.7	401.0	4.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
mockernut hickory	Carya alba	WDL	Medium	65.4	398.8	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
scarlet oak	Quercus coccinea	WDL	Medium	58.8	387.6	4.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	8
sugar maple	Acer saccharum	WDH	High	62.5	350.7	4.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	9
black oak	Quercus velutina	WDH	High	63.8	325.8	3.9	No change	No change	Medium	Common	Fair	Fair			1	10
blackgum	Nyssa sylvatica	WDL	Medium	76.3	323.7	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
post oak	Quercus stellata	WDH	High	51.1	319.5	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
sweetgum	Liquidambar styraciflua	WDH	High	45.1	316.4	5.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
black cherry	Prunus serotina	WDL	Medium	66.6	290.7	3.2	No change	No change	Low	Common	Poor	Poor			0	14
hackberry	Celtis occidentalis	WDH	Medium	22.5	268.7	10.1	No change	No change	High	Common	Good	Good			1	15
eastern redcedar	Juniperus virginiana	WDH	Medium	37.9	261.3	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
American beech	Fagus grandifolia	WDH	High	49.3	241.4	3.1	No change	No change	Medium	Common	Fair	Fair			1	17
southern red oak	Quercus falcata	WDL	Medium	48.5	224.3	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
northern red oak	Quercus rubra	WDH	Medium	47.4	214.6	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
flowering dogwood	Cornus florida	WDL	Medium	63.4	186.3	2.2	No change	No change	Medium	Common	Fair	Fair			1	20
red maple	Acer rubrum	WDH	High	54.4	184.5	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
shagbark hickory	Carya ovata	WSL	Medium	38.3	183.1	3.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	22
sugarberry	Celtis laevigata	NDH	Medium	17.7	164.2	6.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
winged elm	Ulmus alata	WDL	Medium	42.6	163.6	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
boxelder	Acer negundo	WSH	Low	23.6	153.9	5.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
black walnut	Juglans nigra	WDH	Low	31.8	134.0	3.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	26
American elm	Ulmus americana	WDH	Medium	29.8	124.5	3.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	27
green ash	Fraxinus pennsylvanica	WSH	Low	35.7	122.1	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	53.5	107.5	1.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	29
sycamore	Platanus occidentalis	NSL	Low	21	104.4	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	30
chinkapin oak	Quercus muehlenbergii	NSL	Medium	27.3	98.4	2.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	31
common persimmon	Diospyros virginiana	NSL	Low	27.6	91.1	2.2	No change	Lg. inc.	High	Common	Good	Very Good			1	32
Osage-orange	Maclura pomifera	NDH	Medium	5.4	80.1	12.6	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	33
sassafras	Sassafras albidum	WSL	Low	32.6	79.1	1.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	34
slippery elm	Ulmus rubra	WSL	Low	23	77.4	1.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	35
black locust	Robinia pseudoacacia	NDH	Low	13	72.8	4.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	36
shortleaf pine	Pinus echinata	WDH	High	12.6	69.9	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	37
black willow	Salix nigra	NSH	Low	4	56.3	14.2	Sm. dec.	No change	Low	Common	Poor	Poor			0	38
white ash	Fraxinus americana	WDL	Medium	22	52.5	1.5	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	39
silver maple	Acer saccharinum	NSH	Low	3.9	44.8	10.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	40
bitternut hickory	Carya cordiformis	WSL	Low	10.4	43.9	3.9	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	41
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	19.5	41.3	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	42
eastern redbud	Cercis canadensis	NSL	Low	23.4	39.3	1.1	No change	No change	Medium	Rare	Poor	Poor			1	43
Shumard oak	Quercus shumardii	NSL	Low	2.4	38.5	5.6	No change	No change	High	Rare	Fair	Fair		Infill +	2	44
Virginia pine	Pinus virginiana	NDH	High	6.3	34.9	4.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	45
blackjack oak	Quercus marilandica	NSL	Medium	4.1	31.0	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	46
red mulberry	Morus rubra	NSL	Low	11.3	29.3	1.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	47



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cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	4.8	27.0	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		1 48
ailanthus	Ailanthus altissima	NSL	FIA	10.5	26.5	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 49
honeylucust	Gleditsia triacanthos	NSH	Low	6	20.7	2.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good				1 50
eastern white pine	Pinus strobus	WDH	High	1	16.4	16.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 51
serviceberry	Amelanchier spp.	NSL	Low	9.1	11.2	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 52
yellow buckeye	Aesculus flava	NSL	Low	2	9.6	4.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 53
paulownia	Paulownia tomentosa	NSL	FIA	4.6	6.7	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 54
shellbark hickory	Carya laciniosa	NSL	Low	4	6.5	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 55
pawpaw	Asimina triloba	NSL	Low	3.1	6.4	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 56
swamp chestnut oak	Quercus michauxii	NSL	Low	0.9	5.3	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 57
white mulberry	Morus alba	NSL	FIA	1	4.9	4.9	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 58
bigleaf magnolia	Magnolia macrophylla	NSL	Low	1	3.2	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 59
American basswood	Tilia americana	WSL	Medium	1	2.5	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 60
sand hickory	Carya pallida	NSL	FIA	1.4	2.3	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 61
blue ash	Fraxinus quadrangulata	NSL	Low	1	2.0	2.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 62
cucumber tree	Magnolia acuminata	NSL	Low	0.8	1.9	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 63
overcup oak	Quercus lyrata	NSL	Medium	1	1.5	1.5	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor				2 64
wild plum	Prunus americana	NSLX	FIA	0.3	1.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 65
Siberian elm	Ulmus pumila	NDH	FIA	0.4	0.6	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 66
American holly	Ilex opaca	NSL	Medium	1	0.4	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good				2 67
water hickory	Carya aquatica	NSL	Medium	1	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 68
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 69
red spruce	Picea rubens	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 70
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 71
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 72
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 73
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 74
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 75
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 76
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
sweet birch	Betula lenta	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 78
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 79
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 80
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 81
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 82
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 83
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 84
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 85
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +		3 86
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 87
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 88
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 89
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 90
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 91
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 92
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 93
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++		3 94

