

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 9,813.8 3,789.1 303

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	24	25	Increase	22	28	Very Good	7	8
Hickory	5		Medium	28	50	No Change	18	12	Good	20	19
Maple	5	Abundant 7	Low	37	17	Decrease	17	17	Fair	5	13
Oak	7	Common 23	FIA	6		New	25	27	Poor	17	8
Pine	6	Rare 33				Unknown	13	11	Very Poor	8	7
Other	38	Absent 31							FIA Only	3	3
	63	94		95	92		95	95	Unknown	7	5
										67	63

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	52.6	54.5	56.8	57.0	
	CCSM85	52.6	55.0	57.4	60.5	
	GFDL45	52.6	55.4	58.2	59.0	
	GFDL85	52.6	55.9	59.3	63.1	
	HAD45	52.6	55.1	58.4	59.6	
	HAD85	52.6	55.5	59.7	63.9	
Growing Season May—Sep	CCSM45	67.2	69.2	71.3	71.8	
	CCSM85	67.2	69.5	72.1	76.1	
	GFDL45	67.2	70.4	73.8	75.0	
	GFDL85	67.2	71.3	75.3	79.6	
	HAD45	67.2	70.3	73.5	75.1	
	HAD85	67.2	70.5	76.2	80.6	
Coldest Month Average	CCSM45	30.4	32.3	33.5	33.9	
	CCSM85	30.4	33.1	34.1	35.3	
	GFDL45	30.4	33.9	34.3	35.0	
	GFDL85	30.4	32.7	33.7	34.8	
	HAD45	30.4	31.0	33.0	33.3	
	HAD85	30.4	31.7	33.2	34.9	
Warmest Month Average	CCSM45	72.2	74.4	75.6	75.9	
	CCSM85	72.2	74.6	76.3	78.1	
	GFDL45	72.2	75.9	77.8	78.7	
	GFDL85	72.2	77.2	79.8	82.2	
	HAD45	72.2	75.9	78.3	79.3	
	HAD85	72.2	77.0	80.9	83.5	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.8	47.8	49.9	50.3	
	CCSM85	44.8	49.6	50.4	55.0	
	GFDL45	44.8	49.0	50.2	53.5	
	GFDL85	44.8	47.0	51.7	52.8	
	HAD45	44.8	45.6	46.5	46.3	
	HAD85	44.8	46.5	44.4	46.3	
Growing Season May—Sep	CCSM45	21.1	23.1	23.9	23.9	
	CCSM85	21.1	23.6	22.7	25.2	
	GFDL45	21.1	23.1	22.9	24.4	
	GFDL85	21.1	21.5	23.0	23.3	
	HAD45	21.1	21.7	20.4	20.7	
	HAD85	21.1	21.7	19.8	20.5	

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
yellow-poplar	Liriodendron tulipifera	WDH	High	89.4	1577.7	12.9	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	91.8	1285.9	9.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
chestnut oak	Quercus prinus	NDH	High	75.2	1009.8	8.7	No change	No change	High	Abundant	Very Good	Very Good			1	3
sugar maple	Acer saccharum	WDH	High	78.3	705.8	6.1	No change	Sm. dec.	High	Abundant	Very Good	Good			1	4
white oak	Quercus alba	WDH	Medium	75	594.2	5.5	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	5
northern red oak	Quercus rubra	WDH	Medium	74.1	554.2	4.5	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	6
black locust	Robinia pseudoacacia	NDH	Low	80.1	500.1	4.3	No change	No change	Medium	Abundant	Good	Good			1	7
black oak	Quercus velutina	WDH	High	67.2	447.0	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
scarlet oak	Quercus coccinea	WDL	Medium	55.7	422.2	5.1	No change	No change	Medium	Common	Fair	Fair			1	9
American beech	Fagus grandifolia	WDH	High	65.8	417.0	4.9	Sm. inc.	No change	Medium	Common	Good	Fair			1	10
sourwood	Oxydendrum arboreum	NDL	High	74.4	375.7	3.4	No change	Sm. dec.	High	Common	Good	Fair			1	11
sweet birch	Betula lenta	NDH	High	66.7	315.9	3.5	No change	Sm. dec.	Low	Common	Poor	Poor			0	12
pignut hickory	Carya glabra	WDL	Medium	63.7	293.3	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
eastern hemlock	Tsuga canadensis	NSH	High	44.9	276.6	4.9	No change	No change	Low	Common	Poor	Poor			0	14
white ash	Fraxinus americana	WDL	Medium	43.2	264.5	3.9	No change	No change	Low	Common	Poor	Poor			0	15
black cherry	Prunus serotina	WDL	Medium	40.4	224.5	3.7	No change	Sm. inc.	Low	Common	Poor	Fair			1	16
American basswood	Tilia americana	WSL	Medium	41.6	220.4	4.0	No change	No change	Medium	Common	Fair	Fair			1	17
eastern white pine	Pinus strobus	WDH	High	19.3	213.9	6.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	18
mockernut hickory	Carya alba	WDL	Medium	53.6	199.1	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
blackgum	Nyssa sylvatica	WDL	Medium	60.8	181.6	2.0	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
cucumbertree	Magnolia acuminata	NSL	Low	54.7	167.4	2.3	No change	No change	Medium	Common	Fair	Fair			1	21
sassafras	Sassafras albidum	WSL	Low	52.3	160.2	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
yellow buckeye	Aesculus flava	NSL	Low	29.1	154.4	3.1	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	23
sycamore	Platanus occidentalis	NSL	Low	23.3	148.8	5.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	24
yellow birch	Betula alleghaniensis	NDL	High	15.8	88.6	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	30.4	78.7	2.1	No change	No change	Low	Common	Poor	Poor			0	26
shagbark hickory	Carya ovata	WSL	Medium	31.5	77.7	1.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
American elm	Ulmus americana	WDH	Medium	16.9	63.9	2.0	Sm. dec.	Lg. inc.	Medium	Common	Poor	Very Good			1	28
pitch pine	Pinus rigida	NSH	High	15	62.9	2.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	29
bitternut hickory	Carya cordiformis	WSL	Low	26.4	52.2	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
eastern redbud	Cercis canadensis	NSL	Low	17.5	48.2	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
flowering dogwood	Cornus florida	WDL	Medium	33.1	47.2	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
Virginia pine	Pinus virginiana	NDH	High	9.7	46.4	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
river birch	Betula nigra	NSL	Low	1.9	43.9	21.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	34
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	16.1	42.8	1.9	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	35
ailanthus	Ailanthus altissima	NSL	FIA	12	42.8	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
serviceberry	Amelanchier spp.	NSL	Low	23.6	37.8	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	37
slippery elm	Ulmus rubra	WSL	Low	19.9	37.6	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	38
paulownia	Paulownia tomentosa	NSL	FIA	12.9	37.3	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	39
Table Mountain pine	Pinus pungens	NSL	Low	3.6	32.2	5.2	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	40
striped maple	Acer pensylvanicum	NSL	Medium	15.6	28.6	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
red spruce	Picea rubens	NDH	High	0.2	26.3	5.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	42
chinkapin oak	Quercus muehlenbergii	NSL	Medium	6.2	24.3	2.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
black walnut	Juglans nigra	WDH	Low	12.4	24.0	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	44
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	19.5	22.4	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	45
eastern redcedar	Juniperus virginiana	WDH	Medium	1.4	20.7	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	46
Norway spruce	Picea abies	NSH	FIA	1.2	12.7	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	47



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butternut	Juglans cinerea	NSLX	FIA	7.2	11.6	1.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 48
boxelder	Acer negundo	WSH	Low	3.1	10.7	3.5	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +		2 49
American chestnut	Castanea dentata	NSLX	FIA	11.3	10.6	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 50
Osage-orange	Maclura pomifera	NDH	Medium	1	6.3	6.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +			2 51
green ash	Fraxinus pennsylvanica	WSH	Low	4.1	4.8	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 52
black maple	Acer nigrum	NSH	Low	2.7	4.7	1.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 53
red pine	Pinus resinosa	NSH	Medium	2	4.7	2.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 54
pawpaw	Asimina triloba	NSL	Low	5.5	4.3	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 55
shortleaf pine	Pinus echinata	NDH	High	2.2	3.9	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 56
southern red oak	Quercus falcata	WDL	Medium	2	3.8	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 57
pin cherry	Prunus pensylvanica	NSL	Low	1.2	1.6	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 58
northern catalpa	Catalpa speciosa	NSHX	FIA	1	1.4	1.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 59
hackberry	Celtis occidentalis	WDH	Medium	1	1.2	1.2	No change	Lg. inc.	High	Rare	Fair	Good				2 60
American holly	Ilex opaca	NSL	Medium	1.1	1.0	0.2	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +		2 61
shellbark hickory	Carya laciniosa	NSL	Low	0.7	0.6	0.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 62
American mountain-ash	Sorbus americana	NSL	Low	0.2	0.5	0.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 63
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 64
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 65
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 66
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 67
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 68
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 69
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 71
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 72
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 73
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 74
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 75
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				3 76
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown				0 77
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +		3 78
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 79
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 80
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown				3 81
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 82
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 83
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 84
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 85
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 86
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 87
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 88
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 89
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 90
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 91
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +		3 92
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 93
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 94



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cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	95