

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 3,886.5 322

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	26	Increase	RCP45	RCP85	Very Good	14	17	Likely	1	1
Ash	2			Medium	32	No Change	10	8	Good	12	13	Infill	13	14
Hickory	8			Low	34	Decrease	23	21	Fair	13	14	Migrate	5	12
Maple	5	Abundant	7	FIA	5	New	15	15	Poor	13	9			
Oak	16	Common	26			Unknown	12	12	Very Poor	10	9			
Pine	2	Rare	35						FIA Only	3	3			
Other	35	Absent	20						Unknown	7	7			
							90	90		72	72		19	27

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	59.2	61.0	63.0	63.3	
Average	CCSM85	59.2	61.4	63.8	66.7	
	GFDL45	59.2	62.3	64.1	65.2	
	GFDL85	59.2	62.2	65.0	68.8	
	HAD45	59.2	61.7	64.6	66.1	
	HAD85	59.2	62.0	66.6	70.2	
Growing Season	CCSM45	74.4	76.1	77.8	78.4	
	CCSM85	74.4	76.7	79.1	82.7	
May—Sep	GFDL45	74.4	78.0	80.1	82.1	
	GFDL85	74.4	78.2	81.4	86.1	
	HAD45	74.4	77.2	80.0	81.4	
	HAD85	74.4	77.6	83.6	86.8	
Coldest Month	CCSM45	36.0	38.4	39.6	39.8	
	CCSM85	36.0	38.7	39.7	41.3	
Average	GFDL45	36.0	40.1	40.4	40.5	
	GFDL85	36.0	37.4	38.9	39.5	
	HAD45	36.0	37.0	39.2	39.4	
	HAD85	36.0	38.5	40.4	42.1	
Warmest Month	CCSM45	80.4	82.1	83.1	83.3	
	CCSM85	80.4	82.8	83.6	85.5	
Average	GFDL45	80.4	85.3	86.4	87.7	
	GFDL85	80.4	85.1	86.7	90.3	
	HAD45	80.4	83.7	85.4	85.9	
	HAD85	80.4	84.9	88.2	89.4	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	50.6	49.2	52.6	51.4	
Total	CCSM85	50.6	50.6	53.5	53.8	
	GFDL45	50.6	53.8	58.6	55.0	
	GFDL85	50.6	54.7	60.4	59.9	
	HAD45	50.6	49.9	54.1	55.2	
	HAD85	50.6	55.3	48.5	51.8	
Growing Season	CCSM45	20.7	19.4	19.6	19.5	
	CCSM85	20.7	20.1	18.7	19.6	
May—Sep	GFDL45	20.7	21.9	22.6	22.4	
	GFDL85	20.7	22.5	24.8	23.5	
	HAD45	20.7	19.8	20.3	19.8	
	HAD85	20.7	21.2	16.1	16.7	

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
shortleaf pine	Pinus echinata	WDH	High	67.2	1617.9	17.7	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
white oak	Quercus alba	WDH	Medium	71.1	1187.8	11.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
eastern redcedar	Juniperus virginiana	WDH	Medium	74	933.0	10.1	No change	No change	Medium	Abundant	Good	Good			1	3
post oak	Quercus stellata	WDH	High	75.2	925.0	9.3	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
northern red oak	Quercus rubra	WDH	Medium	68.3	791.1	8.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	5
black hickory	Carya texana	NDL	High	80.7	573.5	5.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	6
sweetgum	Liquidambar styraciflua	WDH	High	57.8	569.4	7.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	7
mockernut hickory	Carya alba	WDL	Medium	67.2	419.7	4.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
black oak	Quercus velutina	WDH	High	64.9	377.5	4.0	No change	No change	Medium	Common	Fair	Fair			1	9
blackgum	Nyssa sylvatica	WDL	Medium	65.6	333.9	3.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
loblolly pine	Pinus taeda	WDH	High	21.6	321.2	13.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
winged elm	Ulmus alata	WDL	Medium	82.9	311.4	3.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
willow oak	Quercus phellos	NSL	Low	17.1	225.3	9.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
red maple	Acer rubrum	WDH	High	64.6	219.1	2.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
southern red oak	Quercus falcata	WDL	Medium	36.2	168.0	3.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
florida maple	Acer barbatum	NSL	Low	26	147.0	3.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	16
black cherry	Prunus serotina	WDL	Medium	50.3	140.6	2.0	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
green ash	Fraxinus pennsylvanica	WSH	Low	29	118.7	3.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	18
flowering dogwood	Cornus florida	WDL	Medium	51.7	102.6	1.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
shagbark hickory	Carya ovata	WSL	Medium	25.9	99.8	3.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	20
American beech	Fagus grandifolia	WDH	High	17.7	98.6	5.5	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	21
white ash	Fraxinus americana	WDL	Medium	32.8	95.8	1.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	22
American elm	Ulmus americana	WDH	Medium	27.2	94.8	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
blackjack oak	Quercus marilandica	NSL	Medium	31.1	94.6	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
black locust	Robinia pseudoacacia	NDH	Low	26.6	82.0	2.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	25
bitternut hickory	Carya cordiformis	WSL	Low	24.1	75.7	2.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	26
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	6.9	74.3	7.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	39.4	73.2	1.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
sassafras	Sassafras albidum	WSL	Low	27.6	64.6	2.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	29
water oak	Quercus nigra	WDH	High	12.1	59.9	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	30
common persimmon	Diospyros virginiana	NSL	Low	20.2	57.5	1.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	31
black walnut	Juglans nigra	WDH	Low	12.2	55.4	2.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	32
slippery elm	Ulmus rubra	WSL	Low	18.1	51.5	1.6	No change	No change	Medium	Common	Fair	Fair			1	33
honeylocust	Gleditsia triacanthos	NSH	Low	6.6	47.2	6.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	34
sycamore	Platanus occidentalis	NSL	Low	14.7	45.6	2.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	35
sugar maple	Acer saccharum	WDH	High	10.6	44.2	2.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	36
serviceberry	Amelanchier spp.	NSL	Low	29.6	39.4	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
hackberry	Celtis occidentalis	WDH	Medium	12.3	37.6	2.1	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	38
eastern redbud	Cercis canadensis	NSL	Low	20.2	37.5	1.2	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	39
chinkapin oak	Quercus muehlenbergii	NSL	Medium	10.3	34.1	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	40
eastern cottonwood	Populus deltoides	NSH	Low	1	33.1	33.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
pignut hickory	Carya glabra	WDL	Medium	11	27.1	2.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	42
pecan	Carya illinoensis	NSH	Low	4.9	24.9	5.0	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	43
American basswood	Tilia americana	WSL	Medium	11.8	22.7	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
cedar elm	Ulmus crassifolia	NDH	Medium	2	17.3	8.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	45
sugarberry	Celtis laevigata	NDH	Medium	8.5	15.8	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	46
river birch	Betula nigra	NSL	Low	2.7	13.1	1.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7.6	11.4	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				1 48
overcup oak	Quercus lyrata	NSL	Medium	3.8	11.4	2.8	No change	No change	Low	Rare	Very Poor	Very Poor				2 49
shellbark hickory	Carya laciniosa	NSL	Low	2.8	10.6	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 50
nuttall oak	Quercus texana	NSH	Medium	3	9.5	3.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 51
red mulberry	Morus rubra	NSL	Low	7.8	8.1	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair				1 52
silver maple	Acer saccharinum	NSH	Low	3.9	7.5	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 53
northern catalpa	Catalpa speciosa	NSHX	FIA	2	6.6	3.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 54
pawpaw	Asimina triloba	NSL	Low	3.8	6.0	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 55
water hickory	Carya aquatica	NSL	Medium	1	5.9	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 56
cucumbertree	Magnolia acuminata	NSL	Low	3	4.9	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				2 57
swamp chestnut oak	Quercus michauxii	NSL	Low	2.8	4.8	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 58
bur oak	Quercus macrocarpa	NDH	Medium	1	3.8	3.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 59
Shumard oak	Quercus shumardii	NSL	Low	2.3	3.4	1.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +		2 60
laurel oak	Quercus laurifolia	NDH	Medium	1	2.9	2.9	No change	Sm. inc.	Medium	Rare	Poor	Fair				0 61
boxelder	Acer negundo	WSH	Low	3.1	2.9	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 62
wild plum	Prunus americana	NSLX	FIA	1.3	2.0	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 63
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1.1	1.3	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 64
ailanthus	Ailanthus altissima	NSL	FIA	1	1.3	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 65
black willow	Salix nigra	NSH	Low	0.9	1.2	1.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 66
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0.7	0.8	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 67
paulownia	Paulownia tomentosa	NSL	FIA	1	0.8	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 68
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 69
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 70
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 71
eastern white pine	Pinus strobus	WDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 72
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 73
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 74
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 75
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 76
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 77
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 78
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 79
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 80
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 81
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 82
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 83
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 84
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 85
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 86
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 87
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 88
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 89
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 90