

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
 9,813.8 3,789.1 210

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	18	28	Increase	34	36	Very Good	15	15	Likely	0	0
Hickory	7			Medium	32	52	No Change	13	13	Good	18	19	Infill	12	12
Maple	5	Abundant	1	Low	38	9	Decrease	20	18	Fair	12	14	Migrate	3	7
Oak	17	Common	32	FIA	5		New	15	15	Poor	10	8			
Pine	5	Rare	39				Unknown	11	11	Very Poor	12	11			
Other	35	Absent	20							FIA Only	2	2			
	72		92		93	89		93	93	Unknown	6	6			
											75	75			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	57.0	58.8	60.9	61.2	
	CCSM85	57.0	59.2	62.0	64.9	
	GFDL45	57.0	61.2	62.1	62.9	
	GFDL85	57.0	59.9	63.1	66.8	
	HAD45	57.0	59.7	63.0	64.4	
	HAD85	57.0	60.1	64.8	68.8	
Growing Season (May—Sep)	CCSM45	73.1	75.0	76.6	77.3	
	CCSM85	73.1	75.3	78.3	82.0	
	GFDL45	73.1	78.1	79.0	80.3	
	GFDL85	73.1	76.5	80.4	84.9	
	HAD45	73.1	76.4	79.6	81.4	
	HAD85	73.1	77.0	83.3	87.1	
Coldest Month (Average)	CCSM45	31.8	33.3	34.9	35.3	
	CCSM85	31.8	34.6	35.7	37.3	
	GFDL45	31.8	36.2	36.2	36.7	
	GFDL85	31.8	34.0	35.1	35.7	
	HAD45	31.8	33.2	35.5	35.7	
	HAD85	31.8	34.3	36.5	38.2	
Warmest Month (Average)	CCSM45	78.8	80.5	81.5	82.0	
	CCSM85	78.8	81.2	83.0	84.8	
	GFDL45	78.8	82.2	83.4	84.3	
	GFDL85	78.8	82.4	84.4	87.1	
	HAD45	78.8	82.9	85.3	86.1	
	HAD85	78.8	84.7	88.9	90.7	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.5	46.4	52.4	50.8	
	CCSM85	47.5	50.9	51.3	54.0	
	GFDL45	47.5	54.9	58.4	59.9	
	GFDL85	47.5	54.4	59.8	62.9	
	HAD45	47.5	47.0	50.5	50.5	
	HAD85	47.5	48.4	46.1	51.1	
Growing Season (May—Sep)	CCSM45	19.3	17.8	19.2	18.6	
	CCSM85	19.3	19.9	17.8	18.9	
	GFDL45	19.3	22.4	22.9	23.6	
	GFDL85	19.3	22.4	23.2	24.4	
	HAD45	19.3	17.8	17.1	16.8	
	HAD85	19.3	18.0	14.4	14.8	

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	54.3	556.9	9.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
pignut hickory	Carya glabra	WDL	Medium	56.3	429.1	8.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	2
sugar maple	Acer saccharum	WDH	High	39.8	360.4	7.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
silver maple	Acer saccharinum	NSH	Low	33.1	291.5	12.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
black oak	Quercus velutina	WDH	High	53.3	269.6	5.2	No change	No change	Medium	Common	Fair	Fair			1	5
winged elm	Ulmus alata	WDL	Medium	65.5	256.6	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
post oak	Quercus stellata	WDH	High	59.7	246.5	6.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	64.7	231.9	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
sweetgum	Liquidambar styraciflua	WDH	High	41.9	227.2	6.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
shortleaf pine	Pinus echinata	WDH	High	16.3	205.7	15.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
red maple	Acer rubrum	WDH	High	50.8	198.7	7.2	No change	No change	High	Common	Good	Good			1	11
sassafras	Sassafras albidum	WSL	Low	72.1	193.8	3.7	Sm. dec.	No change	Medium	Common	Poor	Fair			1	12
yellow-poplar	Liriodendron tulipifera	WDH	High	33	190.8	5.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
white ash	Fraxinus americana	WDL	Medium	55.3	183.4	3.8	No change	Sm. inc.	Low	Common	Poor	Fair			1	14
American elm	Ulmus americana	WDH	Medium	72.6	155.7	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
eastern redcedar	Juniperus virginiana	WDH	Medium	38.5	143.2	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
shagbark hickory	Carya ovata	WSL	Medium	60.9	141.5	3.4	No change	No change	Medium	Common	Fair	Fair			1	17
hackberry	Celtis occidentalis	WDH	Medium	55.2	135.4	4.8	No change	No change	High	Common	Good	Good			1	18
blackgum	Nyssa sylvatica	WDL	Medium	51.1	131.9	3.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
black cherry	Prunus serotina	WDL	Medium	57.7	105.8	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	20
boxelder	Acer negundo	WSH	Low	28.8	104.5	5.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	21
mockernut hickory	Carya alba	WDL	Medium	38.3	104.1	3.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
sycamore	Platanus occidentalis	NSL	Low	26	96.0	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
southern red oak	Quercus falcata	WDL	Medium	21.7	89.3	4.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	38.2	83.7	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	25
northern red oak	Quercus rubra	WDH	Medium	27	82.9	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	26
black locust	Robinia pseudoacacia	NDH	Low	14.8	69.5	4.9	Sm. inc.	No change	Medium	Common	Good	Fair			1	27
shingle oak	Quercus imbricaria	NDH	Medium	26.6	62.9	2.9	No change	No change	Medium	Common	Fair	Fair			1	28
honeylocust	Gleditsia triacanthos	NSH	Low	24.5	60.5	7.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	29
bitternut hickory	Carya cordiformis	WSL	Low	30.6	60.2	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	30
black willow	Salix nigra	NSH	Low	18.1	56.8	6.5	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	31
slippery elm	Ulmus rubra	WSL	Low	35.1	56.7	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	32
flowering dogwood	Cornus florida	WDL	Medium	46.6	56.5	1.5	No change	No change	Medium	Common	Fair	Fair			1	33
common persimmon	Diospyros virginiana	NSL	Low	42.3	45.8	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
river birch	Betula nigra	NSL	Low	27.7	44.2	4.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	35
shellbark hickory	Carya laciniosa	NSL	Low	8.4	43.4	7.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	36
scarlet oak	Quercus coccinea	WDL	Medium	18.4	42.2	3.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
eastern cottonwood	Populus deltoides	NSH	Low	12.6	39.8	5.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
chinkapin oak	Quercus muehlenbergii	NSL	Medium	11.3	39.1	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
black walnut	Juglans nigra	WDH	Low	36.9	38.5	1.9	No change	No change	Medium	Rare	Poor	Poor			1	40
loblolly pine	Pinus taeda	WDH	High	6.6	32.6	5.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	41
black hickory	Carya texana	NDL	High	10.8	28.2	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	42
pin oak	Quercus palustris	NSH	Low	25.9	27.6	2.2	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	23.3	25.4	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	44
eastern white pine	Pinus strobus	WDH	High	10.2	21.2	6.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	45
red mulberry	Morus rubra	NSL	Low	27.4	21.1	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	46
Virginia pine	Pinus virginiana	NDH	High	1.4	17.4	8.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47



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northern catalpa	Catalpa speciosa	NSHX	FIA	3.5	17.1	8.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 48
sugarberry	Celtis laevigata	NDH	Medium	21.6	16.3	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1 49
pumpkin ash	Fraxinus profunda	NSH	FIA	0.7	16.2	10.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 50
eastern redbud	Cercis canadensis	NSL	Low	21	12.8	0.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good				1 51
water tupelo	Nyssa aquatica	NSH	Medium	4.7	12.4	8.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 52
blackjack oak	Quercus marilandica	NSL	Medium	10.2	11.0	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 53
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	4.6	10.9	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		1 54
pecan	Carya illinoensis	NSH	Low	12.3	10.3	3.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 55
Shumard oak	Quercus shumardii	NSL	Low	2.2	7.3	1.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 56
swamp white oak	Quercus bicolor	NSL	Low	9.5	6.1	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 57
pawpaw	Asimina triloba	NSL	Low	9.8	6.0	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 58
serviceberry	Amelanchier spp.	NSL	Low	6.4	5.9	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 59
American beech	Fagus grandifolia	WDH	High	7.6	5.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 60
white mulberry	Morus alba	NSL	FIA	4.9	3.1	1.1	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 61
bald cypress	Taxodium distichum	NSH	Medium	8.2	3.0	5.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 62
American basswood	Tilia americana	WSL	Medium	1	2.2	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 63
ailanthus	Ailanthus altissima	NSL	FIA	2	1.5	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 64
bur oak	Quercus macrocarpa	NDH	Medium	7	1.4	1.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 65
black maple	Acer nigrum	NSH	Low	1	1.3	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 66
sourwood	Oxydendrum arboreum	NDL	High	1	0.9	0.9	No change	Sm. inc.	High	Rare	Fair	Good				0 67
overcup oak	Quercus lyrata	NSL	Medium	1	0.9	0.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2 68
Ohio buckeye	Aesculus glabra	NSL	Low	2	0.8	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 69
swamp chestnut oak	Quercus michauxii	NSL	Low	1	0.4	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 70
Scots pine	Pinus sylvestris	NSH	FIA	4.1	0.2	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 71
willow oak	Quercus phellos	NSL	Low	4.1	0.1	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 72
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 73
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		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
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 77
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 78
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 79
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 80
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 81
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 82
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 83
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 84
water elm	Planera aquatica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 85
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 86
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 87
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 88
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 89
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 90
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++			3 91
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 92
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 93