

**U.S. Census Bureau Urban Areas  
Climate Change Atlas Tree Species  
Current and Potential Future Habitat, Capability, and Migration**

	sq. km	sq. mi	FIA Plots
Area of Region	8,264.1	3,190.8	81

**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					
		Abundant	Common	High	Medium	Reliability	Adaptability	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT		
								RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	3						Increase	19	20	Very Good	2	2	Likely	3	3
Hickory	4						No Change	9	6	Good	15	17	Infill	12	12
Maple	5	Abundant	0				Decrease	18	20	Fair	7	5	Migrate	5	8
Oak	7	Common	16				New	18	18	Poor	12	11			
Pine	3	Rare	33				Unknown	6	6	Very Poor	7	6			
Other	27	Absent	19							FIA Only	1	1			
	<b>49</b>		<b>68</b>					<b>70</b>	<b>70</b>	Unknown	3	3			
											<b>47</b>	<b>45</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	50.0	51.8	54.4	54.5	
Average	CCSM85	50.0	52.4	55.0	58.2	
	GFDL45	50.0	55.8	55.8	56.8	
	GFDL85	50.0	53.2	56.8	61.1	
	HAD45	50.0	53.0	56.6	58.2	
	HAD85	50.0	53.3	57.9	62.9	
Growing Season	CCSM45	66.9	68.7	70.9	71.4	
	CCSM85	66.9	69.2	71.8	75.7	
May—Sep	GFDL45	66.9	74.1	73.9	75.3	
	GFDL85	66.9	70.9	75.1	80.1	
	HAD45	66.9	70.4	73.4	75.7	
	HAD85	66.9	70.2	75.8	81.2	
Coldest Month	CCSM45	23.7	25.5	27.4	27.5	
Average	CCSM85	23.7	26.5	27.7	29.7	
	GFDL45	23.7	26.8	27.8	28.5	
	GFDL85	23.7	27.1	28.3	29.9	
	HAD45	23.7	25.0	28.2	28.4	
	HAD85	23.7	26.5	29.1	31.9	
Warmest Month	CCSM45	72.7	74.6	76.0	76.5	
Average	CCSM85	72.7	75.5	77.1	79.4	
	GFDL45	72.7	75.7	77.8	78.7	
	GFDL85	72.7	76.7	78.9	81.8	
	HAD45	72.7	76.5	78.7	80.3	
	HAD85	72.7	77.4	81.4	85.2	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	37.6	38.6	38.5	40.1	
Total	CCSM85	37.6	39.2	39.7	40.6	
	GFDL45	37.6	41.3	44.4	45.5	
	GFDL85	37.6	39.7	45.1	47.3	
	HAD45	37.6	38.2	39.1	39.2	
	HAD85	37.6	39.5	36.6	40.1	
Growing Season	CCSM45	18.2	18.5	18.1	18.5	
Season	CCSM85	18.2	17.9	18.2	17.4	
May—Sep	GFDL45	18.2	20.0	20.7	21.5	
	GFDL85	18.2	19.2	20.6	20.9	
	HAD45	18.2	18.5	16.8	17.7	
	HAD85	18.2	18.1	14.7	15.6	

**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
red maple	Acer rubrum	WDH	High	68.2	380.5	14.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	1
white ash	Fraxinus americana	WDL	Medium	59.1	184.4	10.9	No change	No change	Low	Common	Poor	Poor			0	2
American elm	Ulmus americana	WDH	Medium	69.6	148.4	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	26.6	144.9	11.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
black cherry	Prunus serotina	WDL	Medium	77.7	139.7	10.1	No change	Sm. dec.	Low	Common	Poor	Poor			0	5
sugar maple	Acer saccharum	WDH	High	52.1	136.7	10.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	6
American beech	Fagus grandifolia	WDH	High	42.1	128.6	8.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
northern red oak	Quercus rubra	WDH	Medium	53	124.2	6.1	No change	Sm. dec.	High	Common	Good	Fair			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	62.3	107.2	8.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
eastern cottonwood	Populus deltoides	NSH	Low	36.1	90.8	9.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
American basswood	Tilia americana	WSL	Medium	57.2	78.5	7.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
pin oak	Quercus palustris	NSH	Low	43.1	78.0	8.7	No change	No change	Low	Common	Poor	Poor			0	12
silver maple	Acer saccharinum	NSH	Low	24.5	71.6	7.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
shagbark hickory	Carya ovata	WSL	Medium	47.1	60.8	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
eastern white pine	Pinus strobus	WDH	High	13.3	57.0	9.0	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	15
swamp white oak	Quercus bicolor	NSL	Low	14.5	53.0	8.8	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	16
sycamore	Platanus occidentalis	NSL	Low	15.1	47.7	10.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	17
Osage-orange	Maclura pomifera	NDH	Medium	3.6	41.6	10.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	18
bitternut hickory	Carya cordiformis	WSL	Low	52.3	37.9	5.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	19
slippery elm	Ulmus rubra	WSL	Low	33	31.7	4.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	20
black oak	Quercus velutina	WDH	High	6.1	30.0	17.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
black locust	Robinia pseudoacacia	NDH	Low	15	27.7	7.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	22
black willow	Salix nigra	NSH	Low	13.5	23.7	7.6	Lg. dec.	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	23
sassafras	Sassafras albidum	WSL	Low	17.3	22.0	5.4	Sm. inc.	No change	Medium	Rare	Fair	Poor			1	24
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	35.1	21.0	2.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	25
boxelder	Acer negundo	WSH	Low	21.8	15.9	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	26
black walnut	Juglans nigra	WDH	Low	33	15.9	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	27
white oak	Quercus alba	WDH	Medium	10.6	14.4	3.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
blackgum	Nyssa sylvatica	WDL	Medium	10.5	13.8	1.9	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	29
eastern redcedar	Juniperus virginiana	WDH	Medium	0.8	13.1	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	8.8	10.5	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
pignut hickory	Carya glabra	WDL	Medium	17.5	8.3	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
Norway spruce	Picea abies	NSH	FIA	5.3	5.8	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
cucumbertree	Magnolia acuminata	NSL	Low	8.5	5.4	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
chokecherry	Prunus virginiana	NSLX	FIA	8.2	4.6	6.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
flowering dogwood	Cornus florida	WDL	Medium	13.2	3.3	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
black maple	Acer nigrum	NSH	Low	8.2	3.3	3.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	37
white mulberry	Morus alba	NSL	FIA	3.4	3.1	6.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
black ash	Fraxinus nigra	WSH	Medium	13.6	1.9	1.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	39
red pine	Pinus resinosa	NSH	Medium	4.8	1.7	5.0	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	40
bur oak	Quercus macrocarpa	NDH	Medium	9.7	1.4	2.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	41
mockernut hickory	Carya alba	WDL	Medium	7.5	1.4	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	42
sweetgum	Liquidambar styraciflua	WDH	High	5.3	1.1	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
pin cherry	Prunus pensylvanica	NSL	Low	1.2	1.0	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
bigtooth aspen	Populus grandidentata	NSL	Medium	8.9	0.9	1.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
scarlet oak	Quercus coccinea	WDL	Medium	7.5	0.7	0.7	No change	Lg. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	46
hackberry	Celtis occidentalis	WDH	Medium	9.7	0.6	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	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
sweet birch	Betula lenta	NDH	High	4.8	0.2	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	48
Virginia pine	Pinus virginiana	NDH	High	4.8	0.2	0.6	No change	Lg. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	49
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	50
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	52
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	53
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	54
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	55
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	56
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	57
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	58
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	59
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	60
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	61
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	62
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	63
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	65
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	66
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	67
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	69
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	70