

**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	8,800.0	3,397.7	60

**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 RCP45	Scenario RCP85	Scenario RCP45	Scenario RCP85	SHIFT RCP45	SHIFT RCP85	
Ash	2													
Hickory	3													
Maple	2	0		5	14	Increase	7	7	Very Good	0	0	Likely	2	2
Oak	4	9		15	24	No Change	7	10	Good	5	6	Infill	19	21
Pine	0	22		23	6	Decrease	14	11	Fair	7	8	Migrate	5	7
Other	20	15		3		New	12	12	Poor	10	9			
	<b>31</b>	<b>46</b>		<b>46</b>	<b>44</b>	Unknown	6	6	Very Poor	5	4		<b>26</b>	<b>30</b>
							<b>46</b>	<b>46</b>	FIA Only	1	1			
									Unknown	3	3			
										<b>31</b>	<b>31</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	54.6	56.5	58.5	58.9	
	CCSM85	54.6	57.1	59.5	62.0	
	GFDL45	54.6	60.5	59.7	60.8	
	GFDL85	54.6	57.5	60.5	64.6	
	HAD45	54.6	57.0	60.0	61.3	
	HAD85	54.6	57.4	62.2	65.6	
Growing Season (May—Sep)	CCSM45	72.3	74.6	76.5	77.2	
	CCSM85	72.3	75.4	77.8	80.7	
	GFDL45	72.3	80.1	78.5	80.6	
	GFDL85	72.3	76.0	79.4	84.8	
	HAD45	72.3	74.5	76.8	78.3	
	HAD85	72.3	75.1	80.4	83.5	
Coldest Month (Average)	CCSM45	26.8	28.4	29.8	30.4	
	CCSM85	26.8	29.2	30.2	31.8	
	GFDL45	26.8	30.7	31.2	31.3	
	GFDL85	26.8	29.2	30.5	31.7	
	HAD45	26.8	28.4	31.3	31.1	
	HAD85	26.8	30.4	33.2	35.2	
Warmest Month (Average)	CCSM45	79.1	81.7	82.9	83.6	
	CCSM85	79.1	83.1	84.4	86.0	
	GFDL45	79.1	83.1	84.4	86.0	
	GFDL85	79.1	83.5	84.8	89.0	
	HAD45	79.1	81.3	83.0	83.7	
	HAD85	79.1	83.1	85.9	87.5	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	37.5	36.7	38.2	36.2	
	CCSM85	37.5	37.7	37.7	38.4	
	GFDL45	37.5	41.4	42.8	41.3	
	GFDL85	37.5	41.7	47.5	45.1	
	HAD45	37.5	41.0	40.5	40.4	
	HAD85	37.5	39.2	37.0	40.5	
Growing Season (May—Sep)	CCSM45	22.7	21.5	22.5	20.7	
	CCSM85	22.7	22.2	21.8	21.9	
	GFDL45	22.7	25.4	24.8	24.1	
	GFDL85	22.7	25.5	28.4	26.1	
	HAD45	22.7	23.5	23.9	23.9	
	HAD85	22.7	22.9	20.5	21.2	

**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
American elm	Ulmus americana	WDH	Medium	85.2	210.8	18.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	1
Osage-orange	Maclura pomifera	NDH	Medium	63.6	180.0	17.2	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	2
black walnut	Juglans nigra	WDH	Low	68.2	171.3	13.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	3
hackberry	Celtis occidentalis	WDH	Medium	67	142.0	10.6	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	4
honeylocust	Gleditsia triacanthos	NSH	Low	72.7	137.3	15.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	5
chinkapin oak	Quercus muehlenbergii	NSL	Medium	37.5	107.8	11.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	6
eastern redcedar	Juniperus virginiana	WDH	Medium	42	73.4	7.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	7
silver maple	Acer saccharinum	NSH	Low	6.8	58.5	23.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	8
shagbark hickory	Carya ovata	WSL	Medium	17	57.8	8.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
red mulberry	Morus rubra	NSL	Low	44.3	49.4	8.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	10
eastern redbud	Cercis canadensis	NSL	Low	30.7	47.3	9.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	11
eastern cottonwood	Populus deltoides	NSH	Low	14.8	43.5	20.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	12
northern red oak	Quercus rubra	WDH	Medium	17	42.6	9.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	13
bitternut hickory	Carya cordiformis	WSL	Low	17	34.1	7.3	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	14
bur oak	Quercus macrocarpa	NDH	Medium	21.6	33.0	10.7	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	15
black willow	Salix nigra	NSH	Low	1.1	25.8	20.6	No change	No change	Low	Rare	Very Poor	Very Poor			2	16
sycamore	Platanus occidentalis	NSL	Low	15.9	25.6	7.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	17
green ash	Fraxinus pennsylvanica	WSH	Low	25	25.3	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	18
boxelder	Acer negundo	WSH	Low	19.3	13.9	5.9	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	19
pecan	Carya illinoensis	NSH	Low	9.1	12.5	20.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	20
black locust	Robinia pseudoacacia	NDH	Low	1.1	11.4	9.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	21
slippery elm	Ulmus rubra	WSL	Low	26.1	9.7	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	22
black oak	Quercus velutina	WDH	High	1.1	8.4	6.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	23
white mulberry	Morus alba	NSL	FIA	1.1	7.1	5.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	24
white ash	Fraxinus americana	WDL	Medium	14.8	5.8	4.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	25
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	13.6	3.7	4.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	26
American basswood	Tilia americana	WSL	Medium	1.1	2.3	1.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	27
black cherry	Prunus serotina	WDL	Medium	18.2	1.8	1.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +	2	28
Siberian elm	Ulmus pumila	NDH	FIA	4.5	1.3	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.5	0.4	1.1	Lg. dec.	No change	High	Rare	Poor	Fair			0	30
Ohio buckeye	Aesculus glabra	NSL	Low	4.5	0.3	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	32
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	33
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	34
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	35
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	36
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	37
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	38
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	39
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	41
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	42
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	43
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	44
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	45
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	46