

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

Area of Region sq. km sq. mi FIA Plots
 8,400.0 3,243.3 16

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	1			High	6	10	Increase	4	4	Very Good	0	0	Likely	3	3
Hickory	0			Medium	11	21	No Change	3	3	Good	3	3	Infill	7	8
Maple	1	Abundant	0	Low	15	4	Decrease	6	6	Fair	5	4	Migrate	5	10
Oak	1	Common	4	FIA	3		New	17	17	Poor	2	4		15	21
Pine	0	Rare	12				Unknown	5	5	Very Poor	3	2			
Other	13	Absent	19							FIA Only	3	3			
	16		35		35	35		35	35	Unknown	2	2			
											18	18			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	56.7	58.6	60.4	60.9	
	CCSM85	56.7	59.1	61.2	64.0	
	GFDL45	56.7	62.9	61.7	62.9	
	GFDL85	56.7	59.6	62.5	66.7	
	HAD45	56.7	59.1	62.0	62.8	
HAD85	56.7	59.5	64.3	67.1		
Growing Season (May—Sep)	CCSM45	74.3	76.7	78.5	79.1	
	CCSM85	74.3	77.3	79.4	82.7	
	GFDL45	74.3	82.8	80.6	82.8	
	GFDL85	74.3	78.1	81.6	86.8	
	HAD45	74.3	76.3	78.6	79.3	
HAD85	74.3	77.1	82.2	84.6		
Coldest Month (Average)	CCSM45	30.1	32.2	33.3	34.0	
	CCSM85	30.1	32.3	33.0	34.7	
	GFDL45	30.1	33.9	34.2	34.3	
	GFDL85	30.1	31.7	33.0	33.8	
	HAD45	30.1	31.5	33.8	33.8	
HAD85	30.1	33.5	35.8	37.5		
Warmest Month (Average)	CCSM45	81.1	83.5	84.9	85.4	
	CCSM85	81.1	84.4	85.6	87.5	
	GFDL45	81.1	85.5	86.7	88.3	
	GFDL85	81.1	85.6	87.1	91.3	
	HAD45	81.1	82.9	84.5	84.9	
HAD85	81.1	84.9	87.2	88.6		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	34.2	32.8	33.9	32.9	
	CCSM85	34.2	34.1	34.5	35.4	
	GFDL45	34.2	36.5	39.2	37.7	
	GFDL85	34.2	37.4	42.5	39.8	
	HAD45	34.2	37.6	35.9	37.4	
HAD85	34.2	35.1	32.3	36.0		
Growing Season (May—Sep)	CCSM45	20.3	18.1	18.8	18.3	
	CCSM85	20.3	19.4	19.1	19.8	
	GFDL45	20.3	21.8	22.7	22.1	
	GFDL85	20.3	22.7	25.7	23.5	
	HAD45	20.3	21.8	22.0	21.9	
HAD85	20.3	20.0	17.9	19.2		

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.

Cite as: Iverson, L.R.; Prasad, A.M.; Peters, M.P.; Matthews, S.N. 2019. Facilitating Adaptive Forest Management under Climate Change: A Spatially Specific Synthesis of 125 Species for Habitat Changes and Assisted Migration over the Eastern United States. *Forests*. 10(11): 989. <https://doi.org/10.3390/f10110989>.

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
Osage-orange	Maclura pomifera	NDH	Medium	23.8	157.2	55.3	Lg. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
hackberry	Celtis occidentalis	WDH	Medium	33.3	143.3	36.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	2
American elm	Ulmus americana	WDH	Medium	19	55.5	24.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			2	3
eastern cottonwood	Populus deltoides	NSH	Low	9.5	54.3	47.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	4
red mulberry	Morus rubra	NSL	Low	23.8	46.2	16.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	5
peachleaf willow	Salix amygdaloides	NSLX	FIA	4.8	29.7	52.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	6
green ash	Fraxinus pennsylvanica	WSH	Low	14.3	27.1	15.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	7
northern catalpa	Catalpa speciosa	NSHX	FIA	4.8	22.5	39.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	8
black walnut	Juglans nigra	WDH	Low	9.5	21.5	18.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	9
eastern redbud	Cercis canadensis	NSL	Low	4.8	19.8	34.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	10
eastern redcedar	Juniperus virginiana	WDH	Medium	19	16.4	7.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	11
bur oak	Quercus macrocarpa	NDH	Medium	4.8	12.7	22.4	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	12
slippery elm	Ulmus rubra	WSL	Low	9.5	8.4	7.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	13
boxelder	Acer negundo	WSH	Low	9.5	5.6	4.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	14
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	9.5	4.3	3.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	15
honeylocust	Gleditsia triacanthos	NSH	Low	4.8	0.6	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	16
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	17
sugar maple	Acer saccharum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	18
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	19
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	20
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	21
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	22
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	23
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	24
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	25
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	26
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	27
northern red oak	Quercus rubra	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	28
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	29
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	30
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	31
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	32
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	33
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	34
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	35