

	sq. km	sq. mi	FIA Plots
Area of Region	8,400.0	3,243.3	96

**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	2			High	8	15	Increase	9	10	Very Good	0	0	Likely	3	4
Hickory	3			Medium	17	22	No Change	10	9	Good	7	9	Infill	3	3
Maple	1	Abundant	0	Low	17	6	Decrease	17	17	Fair	6	4	Migrate	2	2
Oak	10	Common	3	FIA	2		New	5	6	Poor	11	11		8	9
Pine	0	Rare	35				Unknown	3	2	Very Poor	12	11			
Other	22	Absent	6							FIA Only	1	1			
	<b>38</b>		<b>44</b>		<b>44</b>	<b>43</b>		<b>44</b>	<b>44</b>	Unknown	1	0			
											<b>38</b>	<b>36</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	62.0	63.6	65.2	65.9	
	CCSM85	62.0	64.3	66.3	68.9	
	GFDL45	62.0	68.0	66.6	68.0	
	GFDL85	62.0	64.9	67.8	71.7	
	HAD45	62.0	64.1	66.8	67.8	
	HAD85	62.0	64.5	68.7	72.0	
Growing Season (May—Sep)	CCSM45	77.2	78.7	80.3	81.2	
	CCSM85	77.2	79.7	81.6	84.9	
	GFDL45	77.2	85.3	82.7	85.3	
	GFDL85	77.2	81.1	84.6	89.4	
	HAD45	77.2	79.3	81.7	82.4	
	HAD85	77.2	79.8	84.7	87.5	
Coldest Month (Average)	CCSM45	39.0	41.3	42.1	42.8	
	CCSM85	39.0	41.3	42.1	43.6	
	GFDL45	39.0	42.5	42.5	42.8	
	GFDL85	39.0	39.8	41.3	41.7	
	HAD45	39.0	39.6	41.9	42.1	
	HAD85	39.0	41.9	43.7	45.5	
Warmest Month (Average)	CCSM45	83.3	84.6	85.6	86.0	
	CCSM85	83.3	85.7	86.5	88.3	
	GFDL45	83.3	88.5	89.0	91.0	
	GFDL85	83.3	88.3	90.1	94.3	
	HAD45	83.3	85.3	86.7	86.9	
	HAD85	83.3	86.4	88.9	89.8	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	39.6	40.0	41.0	39.6	
	CCSM85	39.6	38.5	40.8	40.8	
	GFDL45	39.6	40.9	45.9	40.1	
	GFDL85	39.6	41.2	45.1	43.7	
	HAD45	39.6	40.4	39.9	42.4	
	HAD85	39.6	42.0	36.7	40.3	
Growing Season (May—Sep)	CCSM45	19.2	18.9	18.7	18.5	
	CCSM85	19.2	18.8	17.9	17.7	
	GFDL45	19.2	20.2	22.6	20.0	
	GFDL85	19.2	21.0	23.0	21.2	
	HAD45	19.2	19.5	19.0	19.9	
	HAD85	19.2	20.0	15.8	17.6	

**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.

**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
post oak	Quercus stellata	WDH	High	95.2	157.8	26.5	No change	No change	High	Common	Good	Good			1	1
blackjack oak	Quercus marilandica	NSL	Medium	85.7	59.6	11.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
pecan	Carya illinoensis	NSH	Low	71.4	52.4	11.7	No change	No change	Low	Common	Poor	Poor			0	3
American elm	Ulmus americana	WDH	Medium	76.2	49.7	10.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	4
winged elm	Ulmus alata	WDL	Medium	66.7	48.6	11.7	No change	No change	Medium	Rare	Poor	Poor			1	5
eastern redcedar	Juniperus virginiana	WDH	Medium	61.9	45.0	11.6	No change	No change	Medium	Rare	Poor	Poor			1	6
ashe juniper	Juniperus ashei	NDH	High	19	21.8	18.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			0	7
green ash	Fraxinus pennsylvanica	WSH	Low	42.9	19.1	7.1	No change	No change	Medium	Rare	Poor	Poor			1	8
hackberry	Celtis occidentalis	WDH	Medium	57.1	18.9	5.3	No change	Sm. inc.	High	Rare	Fair	Good			1	9
Osage-orange	Maclura pomifera	NDH	Medium	61.9	16.0	4.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	10
sugarberry	Celtis laevigata	NDH	Medium	66.7	15.7	3.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	11
chinkapin oak	Quercus muehlenbergii	NSL	Medium	28.6	15.7	8.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	12
northern red oak	Quercus rubra	WDH	Medium	42.9	11.7	4.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		1	13
white ash	Fraxinus americana	WDL	Medium	52.4	11.5	3.5	No change	No change	Low	Rare	Very Poor	Very Poor			0	14
black hickory	Carya texana	NDL	High	47.6	8.6	2.9	No change	No change	Medium	Rare	Poor	Poor			1	15
common persimmon	Diospyros virginiana	NSL	Low	23.8	7.0	4.7	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	16
black walnut	Juglans nigra	WDH	Low	19	6.9	5.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	17
black willow	Salix nigra	NSH	Low	28.6	6.6	3.7	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	18
slippery elm	Ulmus rubra	WSL	Low	28.6	6.2	3.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	19
black oak	Quercus velutina	WDH	High	42.9	5.4	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	20
boxelder	Acer negundo	WSH	Low	19	4.7	4.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	21
Shumard oak	Quercus shumardii	NSL	Low	28.6	4.0	2.3	No change	No change	High	Rare	Fair	Fair			1	22
bur oak	Quercus macrocarpa	NDH	Medium	19	4.0	3.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	23
eastern redbud	Cercis canadensis	NSL	Low	23.8	3.3	2.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
sycamore	Platanus occidentalis	NSL	Low	19	2.9	2.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
eastern cottonwood	Populus deltoides	NSH	Low	14.3	2.9	3.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
red mulberry	Morus rubra	NSL	Low	19	2.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
bitternut hickory	Carya cordiformis	WSL	Low	14.3	2.1	2.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	28
honeylocust	Gleditsia triacanthos	NSH	Low	23.8	1.9	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	29
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	19	1.5	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	30
wild plum	Prunus americana	NSLX	FIA	9.5	1.5	2.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	31
white oak	Quercus alba	WDH	Medium	4.8	1.1	3.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	32
black locust	Robinia pseudoacacia	NDH	Low	4.8	1.0	3.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	33
southern red oak	Quercus falcata	WDL	Medium	4.8	0.6	1.9	No change	No change	High	Rare	Fair	Fair			0	34
pin oak	Quercus palustris	NSH	Low	9.5	0.6	0.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	35
black cherry	Prunus serotina	WDL	Medium	4.8	0.1	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
Siberian elm	Ulmus pumila	NDH	FIA	4.8	0.1	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
flowering dogwood	Cornus florida	WDL	Medium	4.8	0.1	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	39
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	40
mockernut hickory	Carya alba	WDL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +	3	41
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	42
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	43
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	44