

Climate Change Atlas Tree Species  
Current and Potential Future Habitat, Capability, and Migration

Area of Region    sq. km    sq. mi    FIA Plots  
120,500    46,525    2,499

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	Scenario	Scenario	Scenario	SHIFT	SHIFT			
				High	30	RCP45	RCP85	Very Good	7	8	RCP45	RCP85		
Ash	5			Medium	40	Increase	33	38	Good	24	26	Likely	0	0
Hickory	8			Low	43	No Change	30	28	Fair	12	15	Infill	38	38
Maple	6	Abundant	2	FIA	5	Decrease	26	23	Poor	27	22	Migrate	1	0
Oak	21	Common	26			New	3	3	Very Poor	19	18			
Pine	6	Rare	66			Unknown	12	12	FIA Only	4	4			
Other	48	Absent	8						Unknown	7	7			
	<b>94</b>		<b>102</b>				<b>104</b>	<b>104</b>		<b>100</b>	<b>100</b>		<b>39</b>	<b>38</b>

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	66.6	68.2	69.9	70.1	
Average	66.6	68.5	70.8	73.1	
GFDL45	66.6	70.1	70.7	71.7	
GFDL85	66.6	69.1	72.1	75.3	
HAD45	66.6	68.9	71.6	72.6	
HAD85	66.6	69.1	72.7	76.3	
Growing Season	79.1	80.5	81.7	82.1	
May—Sep	79.1	80.7	82.9	85.6	
GFDL45	79.1	83.0	83.4	85.3	
GFDL85	79.1	82.0	85.1	89.1	
HAD45	79.1	81.9	84.4	85.0	
HAD85	79.1	82.1	86.7	89.7	
Coldest Month	47.7	50.0	51.0	51.0	
Average	47.7	50.3	51.5	52.8	
GFDL45	47.7	51.1	51.2	51.2	
GFDL85	47.7	48.9	49.9	50.6	
HAD45	47.7	48.4	50.1	50.9	
HAD85	47.7	49.7	51.1	52.9	
Warmest Month	82.8	83.9	84.3	84.5	
Average	82.8	84.2	85.0	86.5	
GFDL45	82.8	86.4	86.4	87.7	
GFDL85	82.8	86.0	87.4	89.8	
HAD45	82.8	86.2	87.5	87.5	
HAD85	82.8	86.6	89.2	90.1	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	59.2	61.0	66.9	64.7	
Total	59.2	61.7	64.6	66.0	
GFDL45	59.2	64.0	72.0	65.3	
GFDL85	59.2	62.9	64.9	65.2	
HAD45	59.2	57.4	58.9	63.0	
HAD85	59.2	62.1	55.2	59.1	
Growing Season	24.6	25.4	26.8	26.0	
May—Sep	24.6	24.2	25.0	24.3	
GFDL45	24.6	27.9	33.1	28.1	
GFDL85	24.6	27.8	29.7	30.6	
HAD45	24.6	23.9	24.1	25.0	
HAD85	24.6	24.4	20.3	20.8	

**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-DGP30 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
loblolly pine	Pinus taeda	WDH	High	51	2035.6	38.4	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	64.8	617.9	9.9	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	56.6	370.9	7.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	3
bald cypress	Taxodium distichum	NSH	Medium	23.2	269.7	15.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	4
slash pine	Pinus elliottii	NDH	High	9.6	248.9	23.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	5
sugarberry	Celtis laevigata	NDH	Medium	26.3	224.0	11.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	6
red maple	Acer rubrum	WDH	High	50.9	208.7	4.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	39.1	185.5	6.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
southern red oak	Quercus falcata	WDL	Medium	33.8	151.1	4.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
willow oak	Quercus phellos	NSL	Low	21.5	148.4	7.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
longleaf pine	Pinus palustris	NSH	Medium	10.7	136.6	13.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
water tupelo	Nyssa aquatica	NSH	Medium	11.9	134.6	14.6	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	12
blackgum	Nyssa sylvatica	WDL	Medium	38.1	126.5	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
black willow	Salix nigra	NSH	Low	12.6	124.0	12.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	14
white oak	Quercus alba	WDH	Medium	26.6	118.1	4.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	15
shortleaf pine	Pinus echinata	WDH	High	19.2	113.8	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	16
American elm	Ulmus americana	WDH	Medium	30.5	104.9	4.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
overcup oak	Quercus lyrata	NSL	Medium	18.9	96.5	6.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	18
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	24.5	89.2	3.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
water hickory	Carya aquatica	NSL	Medium	18.2	86.9	6.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	20
post oak	Quercus stellata	WDH	High	24.2	86.5	3.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
winged elm	Ulmus alata	WDL	Medium	35.1	84.1	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	25	77.0	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	23
Nuttall oak	Quercus texana	NSH	Medium	14.6	65.4	6.5	No change	No change	High	Common	Good	Good			0	24
American beech	Fagus grandifolia	WDH	High	14.4	58.8	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	25
boxelder	Acer negundo	WSH	Low	10.6	57.8	5.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	26
pecan	Carya illinoensis	NSH	Low	8.8	57.8	7.6	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	27
laurel oak	Quercus laurifolia	NDH	Medium	14.6	56.0	4.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	28
sycamore	Platanus occidentalis	NSL	Low	7.7	45.9	5.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
mockernut hickory	Carya alba	WDL	Medium	18.2	37.3	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	30
honeylocust	Gleditsia triacanthos	NSH	Low	10.9	34.4	4.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	31
flowering dogwood	Cornus florida	WDL	Medium	22.3	32.9	1.4	No change	No change	Medium	Rare	Poor	Poor			1	32
swamp tupelo	Nyssa biflora	NDH	Medium	5.7	30.9	5.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	33
sweetbay	Magnolia virginiana	NSL	Medium	9.5	30.0	2.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.3	28.5	1.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	35
swamp chestnut oak	Quercus michauxii	NSL	Low	11.2	27.1	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
black cherry	Prunus serotina	WDL	Medium	20	27.0	1.3	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	37
common persimmon	Diospyros virginiana	NSL	Low	14.5	26.7	1.8	No change	Sm. inc.	High	Rare	Fair	Good			1	38
eastern cottonwood	Populus deltoides	NSH	Low	4.5	26.0	6.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
yellow-poplar	Liriodendron tulipifera	WDH	High	4.2	24.4	4.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	40
American holly	Ilex opaca	NSL	Medium	14.2	22.5	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
slippery elm	Ulmus rubra	WSL	Low	10.8	19.9	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	42
southern magnolia	Magnolia grandiflora	NSL	Low	7.3	17.8	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
spruce pine	Pinus glabra	NSL	Low	2.2	15.7	6.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	44
cedar elm	Ulmus crassifolia	NDH	Medium	5.5	14.4	3.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	45
sassafras	Sassafras albidum	WSL	Low	11	14.4	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	46
water elm	Planera aquatica	NSL	Low	3.4	14.3	4.0	No change	No change	Medium	Rare	Poor	Poor	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
pignut hickory	Carya glabra	WDL	Medium	7.2	12.5	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	48
white ash	Fraxinus americana	WDL	Medium	7.8	10.9	1.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	49
blackjack oak	Quercus marilandica	NSL	Medium	5.8	10.8	1.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	50
live oak	Quercus virginiana	NDH	High	4.2	10.6	5.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	51
Shumard oak	Quercus shumardii	NSL	Low	2.7	8.9	3.0	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	52
bitternut hickory	Carya cordiformis	WSL	Low	3.2	8.3	2.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	53
eastern redcedar	Juniperus virginiana	WDH	Medium	4.1	8.1	1.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	54
Osage-orange	Maclura pomifera	NDH	Medium	0.8	7.3	11.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	55
black oak	Quercus velutina	WDH	High	5.6	6.0	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	56
redbay	Persea borbonia	NSL	Low	4	5.8	1.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	57
waterlocust	Gleditsia aquatica	NSLX	FIA	2	5.6	3.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	58
river birch	Betula nigra	NSL	Low	1.4	4.6	2.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	59
florida maple	Acer barbatum	NSL	Low	2.7	4.3	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	60
red mulberry	Morus rubra	NSL	Low	4.6	4.1	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	61
sourwood	Oxydendrum arboreum	NDL	High	2.7	4.0	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	62
pond cypress	Taxodium ascendens	NSH	Medium	0.9	3.6	5.9	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			2	63
eastern redbud	Cercis canadensis	NSL	Low	1.1	3.5	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
black locust	Robinia pseudoacacia	NDH	Low	1	3.3	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
shagbark hickory	Carya ovata	WSL	Medium	2.1	3.2	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	66
swamp white oak	Quercus bicolor	NSL	Low	0.8	1.9	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	67
black hickory	Carya texana	NDL	High	0.4	1.7	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	68
pin cherry	Prunus pensylvanica	NSL	Low	1.8	1.2	0.8	No change	No change	Medium	Rare	Poor	Poor			0	69
northern red oak	Quercus rubra	WDH	Medium	0.6	1.0	1.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	70
wild plum	Prunus americana	NSLX	FIA	0.4	0.7	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	71
American basswood	Tilia americana	WSL	Medium	1.1	0.7	0.8	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	72
black walnut	Juglans nigra	WDH	Low	0.3	0.6	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	73
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0.4	0.6	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	74
chestnut oak	Quercus prinus	NDH	High	0.2	0.5	3.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	75
shellbark hickory	Carya laciniosa	NSL	Low	0.4	0.5	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	76
silverbell	Halesia spp.	NSL	Low	0.5	0.5	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	77
sugar maple	Acer saccharum	WDH	High	0.3	0.4	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	78
ogeechee tupelo	Nyssa ogeche	NSLX	FIA	0.4	0.4	1.0	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	79
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0.5	0.4	0.7	No change	No change	Medium	Rare	Poor	Poor			0	80
hackberry	Celtis occidentalis	WDH	Medium	0.9	0.4	1.1	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	81
bluejack oak	Quercus incana	NSL	Low	0.4	0.4	0.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	82
white mulberry	Morus alba	NSL	FIA	0.5	0.3	1.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	83
black ash	Fraxinus nigra	WSH	Medium	0.2	0.3	1.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	84
silver maple	Acer saccharinum	NSH	Low	0.5	0.2	1.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	85
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.2	0.2	0.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	86
serviceberry	Amelanchier spp.	NSL	Low	0.2	0.1	0.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			0	87
pawpaw	Asimina triloba	NSL	Low	0.4	0.1	0.3	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	88
pond pine	Pinus serotina	NSH	Medium	0.1	0.1	1.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	89
blue ash	Fraxinus quadrangulata	NSL	Low	0.1	0.1	1.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	90
scarlet oak	Quercus coccinea	WDL	Medium	0.2	0.1	0.4	No change	No change	Medium	Rare	Poor	Poor			0	91
striped maple	Acer pensylvanicum	NSL	Medium	0.2	0.1	0.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			0	92
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.1	0.0	0.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	93
bur oak	Quercus macrocarpa	NDH	Medium	0.1	0.0	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	94

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Atlantic white-cedar	<i>Chamaecyparis thyoides</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +		3	95
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	96
Table Mountain pine	<i>Pinus pungens</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	97
black maple	<i>Acer nigrum</i>	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	98
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	99
loblolly-bay	<i>Gordonia lasianthus</i>	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	100
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	101
turkey oak	<i>Quercus laevis</i>	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	102
cabbage palmetto	<i>Sabal palmetto</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	103
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	104