

**One x One Degree**  
**Climate Change Atlas Tree Species**  
 Current and Potential Future Habitat, Capability, and Migration

Area of Region    sq. km    sq. mi    FIA Plots  
 6,437.3    2,485.5    173

**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	14	Increase	23	27	Very Good	8	9	Likely	0	0
Hickory	5		Medium	31	No Change	11	10	Good	12	14	Infill	16	20
Maple	2	Abundant	Low	30	Decrease	28	25	Fair	10	9	Migrate	0	0
Oak	16	Common	FIA	2	New	4	4	Poor	14	14		16	20
Pine	7	Rare			Unknown	11	11	Very Poor	16	14			
Other	33	Absent						FIA Only	2	2			
	<b>64</b>	<b>76</b>		<b>77</b>	<b>76</b>	<b>77</b>	<b>77</b>	Unknown	9	9			
									<b>71</b>	<b>71</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	65.8	67.2	69.1	69.1	
Average	65.8	67.5	69.7	72.1	
GFDL45	65.8	68.8	70.2	71.0	
GFDL85	65.8	68.3	71.3	74.7	
HAD45	65.8	67.6	69.9	71.2	
HAD85	65.8	67.9	70.8	74.2	
Growing Season	78.0	79.3	80.7	81.1	
May—Sep	78.0	81.1	82.4	83.6	
GFDL85	78.0	80.7	83.7	87.5	
HAD45	78.0	80.4	82.4	83.8	
HAD85	78.0	80.4	84.3	87.5	
Coldest Month	47.3	49.5	50.3	50.2	
Average	47.3	49.3	50.3	51.5	
GFDL45	47.3	50.0	50.4	50.9	
GFDL85	47.3	49.3	50.4	51.1	
HAD45	47.3	47.5	48.9	49.6	
HAD85	47.3	48.3	49.2	50.7	
Warmest Month	82.1	83.4	84.2	84.3	
Average	82.1	83.5	84.9	86.4	
GFDL45	82.1	84.0	84.8	85.7	
GFDL85	82.1	84.3	85.8	87.9	
HAD45	82.1	84.7	85.7	86.2	
HAD85	82.1	85.0	87.2	88.6	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	48.1	51.7	54.4	54.6	
Total	48.1	51.3	54.4	56.9	
GFDL45	48.1	55.0	57.4	59.6	
GFDL85	48.1	53.4	60.1	59.4	
HAD45	48.1	47.0	47.1	48.4	
HAD85	48.1	48.8	44.9	45.1	
Growing Season	24.8	28.9	30.4	29.6	
May—Sep	24.8	27.1	29.9	30.4	
GFDL85	24.8	29.8	35.3	35.5	
HAD45	24.8	24.7	24.0	23.4	
HAD85	24.8	24.8	20.9	19.7	

**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
loblolly pine	Pinus taeda	WDH	High	89.3	4398.0	36.1	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
sweetgum	Liquidambar styraciflua	WDH	High	91.5	1177.3	9.8	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	76.3	728.7	7.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	64.7	535.0	6.1	No change	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
live oak	Quercus virginiana	NDH	High	53.5	348.8	7.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	5
laurel oak	Quercus laurifolia	NDH	Medium	58	299.0	4.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
swamp tupelo	Nyssa biflora	NDH	Medium	48.2	248.9	3.5	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	7
longleaf pine	Pinus palustris	NSH	Medium	16.7	154.6	8.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	35.3	115.1	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
redbay	Persea borbonia	NSL	Low	30.7	109.4	2.5	No change	No change	High	Common	Good	Good			1	10
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	29.1	109.0	3.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
willow oak	Quercus phellos	NSL	Low	35.1	101.6	2.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	12
pond pine	Pinus serotina	NSH	Medium	14.2	98.3	4.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
water tupelo	Nyssa aquatica	NSH	Medium	6.1	95.8	11.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	14
bald cypress	Taxodium distichum	NSH	Medium	14.1	92.9	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
slash pine	Pinus elliotii	NDH	High	13	71.6	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	17.9	64.6	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
green ash	Fraxinus pennsylvanica	WSH	Low	23	63.2	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
yellow-poplar	Liriodendron tulipifera	WDH	High	13.7	59.5	2.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	19
pond cypress	Taxodium ascendens	NSH	Medium	5.5	55.7	3.8	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	2	20
black willow	Salix nigra	NSH	Low	9.3	52.1	4.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	21
swamp chestnut oak	Quercus michauxii	NSL	Low	25.6	47.0	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	22
mockernut hickory	Carya alba	WDL	Medium	21	43.1	1.8	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	23
post oak	Quercus stellata	WDH	High	17.2	42.5	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
cabbage palmetto	Sabal palmetto	NDH	Medium	13.7	41.4	8.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	25
slippery elm	Ulmus rubra	WSL	Low	15.3	38.2	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	26
black cherry	Prunus serotina	WDL	Medium	33.7	36.4	1.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	27
loblolly-bay	Gordonia lasianthus	NSH	Medium	3.4	35.4	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	28
spruce pine	Pinus glabra	NSL	Low	13.4	34.3	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
common persimmon	Diospyros virginiana	NSL	Low	11.3	33.5	1.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	30
American elm	Ulmus americana	WDH	Medium	16.3	28.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
American holly	Ilex opaca	NSL	Medium	17.4	23.1	0.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	32
southern red oak	Quercus falcata	WDL	Medium	9.2	21.7	1.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	33
pignut hickory	Carya glabra	WDL	Medium	9.6	21.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
white oak	Quercus alba	WDH	Medium	14	20.1	0.8	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	35
water hickory	Carya aquatica	NSL	Medium	4.1	19.8	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
southern magnolia	Magnolia grandiflora	NSL	Low	8.9	19.1	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	37
sweetbay	Magnolia virginiana	NSL	Medium	9.5	14.8	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	38
shortleaf pine	Pinus echinata	WDH	High	1.9	14.1	3.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	39
sugarberry	Celtis laevigata	NDH	Medium	8.5	12.8	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	40
boxelder	Acer negundo	WSH	Low	2.7	10.6	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	41
river birch	Betula nigra	NSL	Low	1.1	7.8	3.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	42
red mulberry	Morus rubra	NSL	Low	5.9	6.7	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
hackberry	Celtis occidentalis	WDH	Medium	2.7	6.7	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	44
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.5	6.3	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	45
flowering dogwood	Cornus florida	WDL	Medium	7.2	5.4	0.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
turkey oak	Quercus laevis	NSH	Medium	1.6	5.0	3.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	47

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USDA Forest Service  
Northern Research Station  
Landscape Change Research Group  
Iverson, Peters, Prasad, Matthews

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		
overcup oak	Quercus lyrata	NSL	Medium	0.8	5.0	0.4	No change	No change	Low	Rare	Very Poor	Very Poor				2	48	
sassafras	Sassafras albidum	WSL	Low	14.3	5.0	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor					0	49
pecan	Carya illinoensis	NSH	Low	4.4	4.7	1.7	No change	No change	Low	Rare	Very Poor	Very Poor					2	50
winged elm	Ulmus alata	WDL	Medium	2.7	3.8	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++			2	51
eastern redcedar	Juniperus virginiana	WDH	Medium	6.2	3.8	0.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +			2	52
Virginia pine	Pinus virginiana	NDH	High	4	3.5	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor					0	53
sycamore	Platanus occidentalis	NSL	Low	0.4	3.5	0.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +			2	54
American beech	Fagus grandifolia	WDH	High	2.7	3.0	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost					0	55
scarlet oak	Quercus coccinea	WDL	Medium	1.9	1.9	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor					0	56
sand hickory	Carya pallida	NSL	FIA	1.3	1.7	0.9	Unknown	Unknown	NA	Rare	FIA Only	FIA Only					0	57
northern red oak	Quercus rubra	WDH	Medium	1.5	1.6	1.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor					0	58
black oak	Quercus velutina	WDH	High	4.6	1.4	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost					0	59
bluejack oak	Quercus incana	NSL	Low	1.6	1.0	0.6	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +			2	60
Shumard oak	Quercus shumardii	NSL	Low	0.4	0.8	0.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor					0	61
eastern redbud	Cercis canadensis	NSL	Low	1.9	0.5	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor					0	62
wild plum	Prunus americana	NSLX	FIA	1.6	0.4	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only					0	63
black locust	Robinia pseudoacacia	NDH	Low	4.9	0.3	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor					0	64
florida maple	Acer barbatum	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown					0	65
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown					0	66
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	67
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	68
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					0	69
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	70
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	71
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown					0	72
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	73
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	74
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown					0	75
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	76
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat					0	77