

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

sq. km      sq. mi      FIA Plots  
 Area of Region    10,188    3,933.4      388

**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	22	27	Increase	29	32	Very Good	9	10	Likely	5	6
Hickory	4			Medium	33	52	No Change	13	13	Good	17	23	Infill	14	18
Maple	5	Abundant	7	Low	36	14	Decrease	23	20	Fair	13	8	Migrate	3	7
Oak	13	Common	18	FIA	3		New	16	18	Poor	13	14			
Pine	6	Rare	43				Unknown	13	11	Very Poor	13	10			
Other	38	Absent	25							FIA Only	2	2			
	<b>68</b>		<b>93</b>		<b>94</b>	<b>93</b>		<b>94</b>	<b>94</b>	Unknown	10	8		<b>22</b>	<b>31</b>
											<b>77</b>	<b>75</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.8	60.7	62.8	62.9	
	CCSM85	58.8	61.1	63.5	66.2	
	GFDL45	58.8	61.7	63.7	64.5	
	GFDL85	58.8	61.6	64.9	68.4	
	HAD45	58.8	61.1	64.0	65.4	
	HAD85	58.8	61.4	65.7	69.5	
Growing Season May—Sep	CCSM45	72.5	74.3	76.1	76.6	
	CCSM85	72.5	74.5	77.1	80.6	
	GFDL45	72.5	75.7	77.9	79.2	
	GFDL85	72.5	75.6	79.5	83.5	
	HAD45	72.5	75.6	78.3	79.8	
	HAD85	72.5	75.6	81.7	85.3	
Coldest Month Average	CCSM45	38.3	40.7	41.6	41.6	
	CCSM85	38.3	41.0	42.0	43.1	
	GFDL45	38.3	41.6	41.7	42.1	
	GFDL85	38.3	40.2	41.2	41.7	
	HAD45	38.3	38.1	40.1	40.5	
	HAD85	38.3	39.4	40.7	42.2	
Warmest Month Average	CCSM45	77.2	79.2	80.1	80.1	
	CCSM85	77.2	79.4	80.9	82.7	
	GFDL45	77.2	80.2	81.3	82.1	
	GFDL85	77.2	80.4	82.5	84.6	
	HAD45	77.2	81.2	83.1	83.7	
	HAD85	77.2	81.7	85.8	87.5	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	56.3	59.0	62.5	62.1	
	CCSM85	56.3	59.8	62.2	68.7	
	GFDL45	56.3	63.6	66.2	70.6	
	GFDL85	56.3	62.9	66.8	68.7	
	HAD45	56.3	55.1	60.3	61.8	
	HAD85	56.3	61.4	55.0	59.6	
Growing Season May—Sep	CCSM45	22.4	24.0	25.1	25.5	
	CCSM85	22.4	23.7	23.7	26.4	
	GFDL45	22.4	27.5	28.8	30.1	
	GFDL85	22.4	26.6	29.4	30.4	
	HAD45	22.4	22.0	23.0	22.9	
	HAD85	22.4	24.8	18.7	21.0	

**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>.

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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	71.3	1752.8	21.7	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
yellow-poplar	Liriodendron tulipifera	WDH	High	82	967.4	9.8	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
chestnut oak	Quercus prinus	NDH	High	54.9	745.9	11.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
Virginia pine	Pinus virginiana	NDH	High	70.9	741.3	8.7	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
red maple	Acer rubrum	WDH	High	79.4	683.4	7.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	5
white oak	Quercus alba	WDH	Medium	75.9	583.5	6.5	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	6
sourwood	Oxydendrum arboreum	NDL	High	72.9	572.0	6.9	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	7
sweetgum	Liquidambar styraciflua	WDH	High	59.8	485.8	6.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	8
scarlet oak	Quercus coccinea	WDL	Medium	66.1	351.7	4.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
southern red oak	Quercus falcata	WDL	Medium	61.7	300.5	4.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
shortleaf pine	Pinus echinata	WDH	High	62.6	290.5	3.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
eastern white pine	Pinus strobus	WDH	High	32.4	289.1	8.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	12
pignut hickory	Carya glabra	WDL	Medium	69.7	269.2	3.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
mockernut hickory	Carya alba	WDL	Medium	57	213.1	2.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
post oak	Quercus stellata	WDH	High	53.8	203.2	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
blackgum	Nyssa sylvatica	WDL	Medium	71	181.2	2.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
black cherry	Prunus serotina	WDL	Medium	57.2	173.0	2.6	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	17
flowering dogwood	Cornus florida	WDL	Medium	64.1	162.5	2.1	No change	No change	Medium	Common	Fair	Fair			1	18
black oak	Quercus velutina	WDH	High	51.9	141.0	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
northern red oak	Quercus rubra	WDH	Medium	48.2	122.3	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
green ash	Fraxinus pennsylvanica	WSH	Low	27.4	116.5	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
water oak	Quercus nigra	WDH	High	29.3	113.1	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
boxelder	Acer negundo	WSH	Low	6.5	76.1	5.7	Sm. dec.	No change	High	Common	Fair	Good			1	23
sugarberry	Celtis laevigata	NDH	Medium	2.2	71.4	23.7	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	2	24
eastern hemlock	Tsuga canadensis	NSH	High	19.4	65.4	3.3	Sm. inc.	No change	Low	Common	Fair	Poor	Infill +	Infill +	1	25
sweet birch	Betula lenta	NDH	High	21.3	45.8	2.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	26
winged elm	Ulmus alata	WDL	Medium	17.9	42.1	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	27
sycamore	Platanus occidentalis	NSL	Low	10	34.4	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	28
blackjack oak	Quercus marilandica	NSL	Medium	11.6	31.2	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	29
black locust	Robinia pseudoacacia	NDH	Low	20.3	29.0	1.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	30
black walnut	Juglans nigra	WDH	Low	5.1	26.8	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
sassafras	Sassafras albidum	WSL	Low	25.8	26.7	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	32
American beech	Fagus grandifolia	WDH	High	22.9	23.8	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	33
common persimmon	Diospyros virginiana	NSL	Low	15.4	22.5	1.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	34
slippery elm	Ulmus rubra	WSL	Low	4.9	21.4	4.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	35
American elm	Ulmus americana	WDH	Medium	3.8	21.2	4.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	36
eastern redcedar	Juniperus virginiana	WDH	Medium	10.2	19.6	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
American basswood	Tilia americana	WSL	Medium	8.1	16.5	1.4	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		1	38
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8.6	16.3	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	39
American holly	Ilex opaca	NSL	Medium	16.3	15.2	0.9	No change	Lg. inc.	Medium	Rare	Poor	Good			1	40
red mulberry	Morus rubra	NSL	Low	5.7	15.0	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	41
shagbark hickory	Carya ovata	WSL	Medium	4.1	14.1	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	42
longleaf pine	Pinus palustris	NSH	Medium	1.9	11.8	5.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
florida maple	Acer barbatum	NSL	Low	4.7	11.3	1.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	44
black willow	Salix nigra	NSH	Low	4.9	11.0	9.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	45
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	6.4	9.9	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	46
serviceberry	Amelanchier spp.	NSL	Low	14.2	9.0	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
river birch	Betula nigra	NSL	Low	6.9	8.4	2.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	48
eastern redbud	Cercis canadensis	NSL	Low	5.5	7.8	0.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	49
willow oak	Quercus phellos	NSL	Low	2	7.5	3.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	50
honeylocust	Gleditsia triacanthos	NSH	Low	3.4	6.6	1.0	No change	No change	High	Rare	Fair	Fair		Infill +	2	51
cucumbertree	Magnolia acuminata	NSL	Low	4.9	6.4	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	52
bitternut hickory	Carya cordiformis	WSL	Low	4.9	5.1	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	53
white ash	Fraxinus americana	WDL	Medium	4.2	4.5	0.7	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	54
yellow buckeye	Aesculus flava	NSL	Low	2.9	2.8	0.9	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	55
paulownia	Paulownia tomentosa	NSL	FIA	2.9	2.8	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
yellow birch	Betula alleghaniensis	NDL	High	2	2.3	1.2	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			0	57
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	2.2	1.1	0.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	58
pitch pine	Pinus rigida	NSH	High	0.9	1.0	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	59
hackberry	Celtis occidentalis	WDH	Medium	4.4	1.0	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	60
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0.3	0.9	0.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	61
black maple	Acer nigrum	NSH	Low	1	0.5	0.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	62
nuttall oak	Quercus texana	NSH	Medium	1	0.4	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	63
butternut	Juglans cinerea	NSLX	FIA	1	0.4	0.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	64
sugar maple	Acer saccharum	WDH	High	1	0.4	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	65
American chestnut	Castanea dentata	NSLX	FIA	1.9	0.3	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	66
Shumard oak	Quercus shumardii	NSL	Low	1	0.3	0.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	67
bigleaf magnolia	Magnolia macrophylla	NSL	Low	1	0.2	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	68
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	69
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	70
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	72
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Likely +	3	73
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	74
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	75
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	79
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	80
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	82
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	84
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	86
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	87
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	88
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	89
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	90
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	91
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	92
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	93
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	94

