

**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	9,941.4	3,838.4	314

**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	3			High	17	22	Increase	22	32	Very Good	6	10	Likely	1	1
Hickory	6			Medium	33	49	No Change	13	7	Good	19	23	Infill	12	12
Maple	4	Abundant	4	Low	31	10	Decrease	30	26	Fair	7	7	Migrate	2	3
Oak	15	Common	23	FIA	5		New	7	6	Poor	17	12			
Pine	4	Rare	43				Unknown	14	15	Very Poor	8	6			
Other	38	Absent	13							FIA Only	2	2			
	<b>70</b>		<b>83</b>		<b>86</b>	<b>81</b>		<b>86</b>	<b>86</b>	Unknown	9	10			
											<b>68</b>	<b>70</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.1	60.9	63.0	63.1	
	CCSM85	59.1	61.2	63.6	66.6	
	GFDL45	59.1	61.7	64.1	65.1	
	GFDL85	59.1	62.0	65.3	69.0	
	HAD45	59.1	61.1	64.1	65.4	
HAD85	59.1	61.4	65.0	69.0		
Growing Season (May—Sep)	CCSM45	73.5	75.3	77.1	77.6	
	CCSM85	73.5	75.4	78.1	81.6	
	GFDL45	73.5	76.3	79.0	80.5	
	GFDL85	73.5	76.9	80.5	84.6	
	HAD45	73.5	76.0	78.6	80.2	
HAD85	73.5	76.0	80.2	84.5		
Coldest Month (Average)	CCSM45	37.7	39.9	40.9	41.0	
	CCSM85	37.7	40.1	41.1	42.5	
	GFDL45	37.7	41.0	41.4	42.1	
	GFDL85	37.7	39.8	40.8	42.0	
	HAD45	37.7	38.6	40.4	40.8	
HAD85	37.7	38.8	40.2	41.8		
Warmest Month (Average)	CCSM45	79.1	81.1	82.1	82.1	
	CCSM85	79.1	81.2	83.1	84.5	
	GFDL45	79.1	81.9	83.0	84.2	
	GFDL85	79.1	82.7	84.4	86.8	
	HAD45	79.1	81.8	83.5	84.1	
HAD85	79.1	82.2	84.8	87.4		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.7	51.2	54.0	54.0	
	CCSM85	45.7	51.7	53.9	60.9	
	GFDL45	45.7	49.9	54.1	56.5	
	GFDL85	45.7	49.4	54.4	56.2	
	HAD45	45.7	50.7	50.6	48.5	
HAD85	45.7	52.8	48.5	48.1		
Growing Season (May—Sep)	CCSM45	21.6	26.8	28.5	28.7	
	CCSM85	21.6	25.8	27.4	31.7	
	GFDL45	21.6	23.9	26.5	28.2	
	GFDL85	21.6	23.2	27.3	28.3	
	HAD45	21.6	24.7	23.3	21.8	
HAD85	21.6	25.6	22.9	21.1		

**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.

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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	96.1	4815.5	38.5	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	97	1535.6	11.4	No change	No change	Medium	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	91.8	943.2	7.3	No change	No change	High	Abundant	Very Good	Very Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	76.7	657.8	6.7	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	72.5	389.5	4.2	No change	No change	High	Common	Good	Good			1	5
American holly	Ilex opaca	NSL	Medium	65.7	218.6	2.4	No change	No change	Medium	Common	Fair	Fair			1	6
willow oak	Quercus phellos	NSL	Low	47.7	213.0	3.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	7
water tupelo	Nyssa aquatica	NSH	Medium	14.8	201.1	10.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	8
green ash	Fraxinus pennsylvanica	WSH	Low	37.2	188.2	3.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
water oak	Quercus nigra	WDH	High	51.2	181.0	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
southern red oak	Quercus falcata	WDL	Medium	49.7	153.9	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
swamp tupelo	Nyssa biflora	NDH	Medium	28.8	128.5	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	12
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	47.5	126.6	1.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
river birch	Betula nigra	NSL	Low	32	124.4	3.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	14
American elm	Ulmus americana	WDH	Medium	38.9	118.9	2.1	No change	Lg. inc.	Medium	Common	Fair	Very Good			1	15
American beech	Fagus grandifolia	WDH	High	29	101.5	2.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	16
sourwood	Oxydendrum arboreum	NDL	High	43.1	98.3	1.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	17
black cherry	Prunus serotina	WDL	Medium	32.6	90.1	2.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	18
bald cypress	Taxodium distichum	NSH	Medium	14.2	87.0	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
scarlet oak	Quercus coccinea	WDL	Medium	33.5	84.6	2.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	20
winged elm	Ulmus alata	WDL	Medium	33.4	83.7	1.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	21
sycamore	Platanus occidentalis	NSL	Low	21	79.7	3.4	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	22
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	18.6	78.2	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
black oak	Quercus velutina	WDH	High	34.5	75.8	1.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
blackgum	Nyssa sylvatica	WDL	Medium	53.1	75.1	1.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	25
mockernut hickory	Carya alba	WDL	Medium	35.6	71.9	1.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
pignut hickory	Carya glabra	WDL	Medium	26.7	51.2	1.4	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
swamp chestnut oak	Quercus michauxii	NSL	Low	18.8	44.0	1.7	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	28
slippery elm	Ulmus rubra	WSL	Low	9.5	41.1	4.0	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
northern red oak	Quercus rubra	WDH	Medium	21.1	40.0	1.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	30
sweetbay	Magnolia virginiana	NSL	Medium	21.5	37.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
eastern redcedar	Juniperus virginiana	WDH	Medium	17.5	31.1	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
laurel oak	Quercus laurifolia	NDH	Medium	14	28.7	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
hackberry	Celtis occidentalis	WDH	Medium	6.2	26.4	1.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	34
boxelder	Acer negundo	WSL	Low	7.6	25.1	2.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	1	35
flowering dogwood	Cornus florida	WDL	Medium	28.9	23.3	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	36
eastern cottonwood	Populus deltoides	NSH	Low	4.3	20.5	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
post oak	Quercus stellata	WDH	High	17.2	20.0	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	38
sugarberry	Celtis laevigata	NDH	Medium	2.1	19.8	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	39
black willow	Salix nigra	NSH	Low	7.6	19.7	1.2	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	1	40
bitternut hickory	Carya cordiformis	WSL	Low	4	18.6	4.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	41
common persimmon	Diospyros virginiana	NSL	Low	13.3	18.3	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	42
shortleaf pine	Pinus echinata	WDH	High	9.9	17.9	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	43
overcup oak	Quercus lyrata	NSL	Medium	5.5	13.2	1.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	44
shagbark hickory	Carya ovata	WSL	Medium	4.9	12.1	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	45
white ash	Fraxinus americana	WDL	Medium	6.1	12.0	1.5	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	46
Virginia pine	Pinus virginiana	NDH	High	7.1	10.1	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	47



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eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3	9.5	3.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	48
florida maple	Acer barbatum	NSL	Low	4.8	8.6	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	49
sassafras	Sassafras albidum	WSL	Low	10.1	7.4	0.6	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			1	50
red mulberry	Morus rubra	NSL	Low	2.1	5.5	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
black walnut	Juglans nigra	WDH	Low	5	5.2	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	52
chestnut oak	Quercus prinus	NDH	High	2	3.8	1.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	53
redbay	Persea borbonia	NSL	Low	0.3	3.7	0.3	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	54
eastern redbud	Cercis canadensis	NSL	Low	3.6	3.3	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
Osage-orange	Maclura pomifera	NDH	Medium	0.7	2.9	2.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	56
pond pine	Pinus serotina	NSH	Medium	2.8	2.4	0.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +		2	57
blackjack oak	Quercus marilandica	NSL	Medium	2	2.4	1.2	Very Lg. dec.	Lg. inc.	High	Rare	Lost	Good			2	58
paulownia	Paulownia tomentosa	NSL	FIA	1	2.4	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	59
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0.2	1.5	0.3	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	60
Shumard oak	Quercus shumardii	NSL	Low	3	1.5	0.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	61
pond cypress	Taxodium ascendens	NSH	Medium	0.1	1.5	0.2	No change	Very Lg. dec.	Medium	Rare	Poor	Lost	Infill +		2	62
Carolina ash	Fraxinus caroliniana	NSL	FIA	2	1.5	0.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	63
water hickory	Carya aquatica	NSL	Medium	1	1.4	1.4	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +		2	64
sugar maple	Acer saccharum	WDH	High	0.7	1.2	0.8	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	65
ailanthus	Ailanthus altissima	NSL	FIA	2	1.2	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	66
pawpaw	Asimina triloba	NSL	Low	1.1	1.2	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	67
sand hickory	Carya pallida	NSL	FIA	1	1.1	1.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	68
honeylocust	Gleditsia triacanthos	NSH	Low	1	0.7	0.7	Very Lg. dec.	Sm. inc.	High	Rare	Lost	Good			2	69
white mulberry	Morus alba	NSL	FIA	1	0.6	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	70
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	72
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	73
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	75
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	76
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	78
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	79
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	81
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	83
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	85
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	86