

**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    10,574    4,082.7    343

**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									
Hickory	4									
Maple	2	Abundant 6	High 15	21	Increase 19	20	Very Good 7	8	Likely 1	1
Oak	14	Common 17	Medium 34	53	No Change 22	23	Good 15	15	Infill 13	15
Pine	7	Rare 39	Low 33	10	Decrease 17	15	Fair 7	9	Migrate 2	4
Other	32	Absent 20	FIA 4		New 9	11	Poor 16	14		
	<b>62</b>	<b>82</b>	<b>86</b>	<b>84</b>	Unknown 19	17	Very Poor 12	12	<b>16</b>	<b>20</b>
					<b>86</b>	<b>86</b>	FIA Only 4	4		
							Unknown 15	13		
							<b>76</b>	<b>75</b>		

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	67.6	69.2	71.0	71.0	
	CCSM85	67.6	69.4	71.7	74.1	
	GFDL45	67.6	70.2	72.2	72.9	
	GFDL85	67.6	70.1	73.2	76.7	
	HAD45	67.6	69.7	72.3	73.7	
	HAD85	67.6	70.2	73.5	77.3	
Growing Season May—Sep	CCSM45	78.7	80.0	81.4	81.9	
	CCSM85	78.7	80.1	82.5	85.3	
	GFDL45	78.7	81.2	83.1	84.2	
	GFDL85	78.7	81.4	84.3	88.3	
	HAD45	78.7	81.8	84.0	85.6	
	HAD85	78.7	81.9	86.5	90.0	
Coldest Month Average	CCSM45	50.3	52.7	53.6	53.1	
	CCSM85	50.3	52.3	53.4	54.7	
	GFDL45	50.3	53.2	53.5	54.0	
	GFDL85	50.3	52.6	53.7	54.5	
	HAD45	50.3	50.2	51.5	52.4	
	HAD85	50.3	51.1	52.1	53.9	
Warmest Month Average	CCSM45	81.7	83.1	83.9	84.3	
	CCSM85	81.7	83.2	84.5	86.2	
	GFDL45	81.7	84.1	84.8	85.5	
	GFDL85	81.7	84.2	85.6	87.7	
	HAD45	81.7	85.3	86.5	87.2	
	HAD85	81.7	85.4	88.1	89.7	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	52.5	56.8	58.5	59.9	
	CCSM85	52.5	55.7	59.5	61.1	
	GFDL45	52.5	58.4	60.6	63.2	
	GFDL85	52.5	56.8	62.6	60.0	
	HAD45	52.5	49.9	52.0	54.8	
	HAD85	52.5	51.6	48.6	50.6	
Growing Season May—Sep	CCSM45	26.0	29.1	29.5	29.6	
	CCSM85	26.0	27.2	30.6	31.1	
	GFDL45	26.0	31.2	32.2	32.9	
	GFDL85	26.0	30.5	34.7	33.6	
	HAD45	26.0	25.0	25.2	25.1	
	HAD85	26.0	24.6	21.4	21.7	

**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.

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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
slash pine	Pinus elliottii	NDH	High	80.4	3618.2	30.8	No change	No change	Medium	Abundant	Good	Good			1	1
loblolly pine	Pinus taeda	WDH	High	60.3	1529.1	18.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
water oak	Quercus nigra	WDH	High	77.3	848.8	7.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
laurel oak	Quercus laurifolia	NDH	Medium	64.9	826.5	9.4	No change	No change	Medium	Abundant	Good	Good			1	4
swamp tupelo	Nyssa biflora	NDH	Medium	54.9	614.9	7.9	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	5
live oak	Quercus virginiana	NDH	High	56	587.8	7.1	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
red maple	Acer rubrum	WDH	High	58.7	437.2	5.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
sweetgum	Liquidambar styraciflua	WDH	High	61	413.5	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
longleaf pine	Pinus palustris	NSH	Medium	21.5	403.1	15.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
pond cypress	Taxodium ascendens	NSH	Medium	34.1	331.0	6.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
sweetbay	Magnolia virginiana	NSL	Medium	39.6	293.7	5.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
black cherry	Prunus serotina	WDL	Medium	37.8	178.2	2.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	12
redbay	Persea borbonia	NSL	Low	34.4	143.2	3.2	No change	No change	High	Common	Good	Good			1	13
loblolly-bay	Gordonia lasianthus	NSH	Medium	17.3	123.6	5.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
blackgum	Nyssa sylvatica	WDL	Medium	28.5	82.8	2.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
cabbage palmetto	Sabal palmetto	NDH	Medium	5.3	82.0	7.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			0	16
yellow-poplar	Liriodendron tulipifera	WDH	High	6.8	79.4	6.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	17
shortleaf pine	Pinus echinata	WDH	High	8.4	79.1	5.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	18
sand pine	Pinus clausa	NDH	High	2.1	77.1	19.0	No change	No change	Low	Common	Poor	Poor	Infill +		2	19
bald cypress	Taxodium distichum	NSH	Medium	9.5	73.1	4.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	20
southern red oak	Quercus falcata	WDL	Medium	12.9	72.0	4.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
mockernut hickory	Carya alba	WDL	Medium	11.4	60.7	3.9	No change	No change	High	Common	Good	Good			1	22
pignut hickory	Carya glabra	WDL	Medium	15.9	53.2	2.5	Sm. dec.	No change	Medium	Common	Poor	Fair			1	23
post oak	Quercus stellata	WDH	High	13.1	49.7	3.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
pond pine	Pinus serotina	NSH	Medium	7.3	47.6	6.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	25
green ash	Fraxinus pennsylvanica	WSH	Low	6.7	40.1	2.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	26
white oak	Quercus alba	WDH	Medium	5.5	34.9	2.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	27
turkey oak	Quercus laevis	NSH	Medium	7.8	32.9	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	28
pecan	Carya illinoensis	NSH	Low	5	32.5	4.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	29
eastern redcedar	Juniperus virginiana	WDH	Medium	5.5	31.8	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	30
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	8.2	30.8	2.4	No change	No change	Medium	Rare	Poor	Poor			1	31
southern magnolia	Magnolia grandiflora	NSL	Low	11.7	30.1	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
American elm	Ulmus americana	WDH	Medium	12.6	27.5	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	33
scarlet oak	Quercus coccinea	WDL	Medium	0.7	23.6	17.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
common persimmon	Diospyros virginiana	NSL	Low	14.1	23.6	1.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	35
spruce pine	Pinus glabra	NSL	Low	6.8	22.4	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
black willow	Salix nigra	NSH	Low	5.9	21.4	3.0	No change	No change	Low	Rare	Very Poor	Very Poor			0	37
bluejack oak	Quercus incana	NSL	Low	3.1	17.3	4.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
American holly	Ilex opaca	NSL	Medium	9.4	15.7	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
river birch	Betula nigra	NSL	Low	3.1	14.1	3.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	40
swamp chestnut oak	Quercus michauxii	NSL	Low	3.7	13.1	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
ogeechee tupelo	Nyssa ogechee	NSLX	FIA	0.9	12.6	13.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	42
flowering dogwood	Cornus florida	WDL	Medium	6.5	11.0	1.0	No change	No change	Medium	Rare	Poor	Poor			1	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	2.7	7.2	1.4	No change	No change	High	Rare	Fair	Fair		Infill +	1	44
florida maple	Acer barbatum	NSL	Low	1.9	5.5	2.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	45
willow oak	Quercus phellos	NSL	Low	1.9	5.3	2.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	46
pumpkin ash	Fraxinus profunda	NSH	FIA	0.9	4.9	5.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	47

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

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
hackberry	Celtis occidentalis	WDH	Medium	4.3	4.8	0.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	48
American beech	Fagus grandifolia	WDH	High	3.8	4.4	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	49
red mulberry	Morus rubra	NSL	Low	2	3.4	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
water tupelo	Nyssa aquatica	NSH	Medium	3	3.1	0.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	51
wild plum	Prunus americana	NSLX	FIA	2.8	3.1	1.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
American basswood	Tilia americana	WSL	Medium	0.9	2.7	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
sassafras	Sassafras albidum	WSL	Low	2.6	2.4	0.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	54
winged elm	Ulmus alata	WDL	Medium	1.2	0.9	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
Carolina ash	Fraxinus caroliniana	NSL	FIA	0.9	0.8	0.8	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	56
Shumard oak	Quercus shumardii	NSL	Low	0.2	0.7	0.1	No change	No change	High	Rare	Fair	Fair			0	57
sourwood	Oxydendrum arboreum	NDL	High	0.9	0.7	0.8	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor			0	58
slippery elm	Ulmus rubra	WSL	Low	0.9	0.7	0.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	59
nuttall oak	Quercus texana	NSH	Medium	0.9	0.4	0.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	60
bitternut hickory	Carya cordiformis	WSL	Low	0.9	0.3	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	61
black oak	Quercus velutina	WDH	High	0.9	0.1	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
Virginia pine	Pinus virginiana	NDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
boxelder	Acer negundo	WSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	64
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
silver maple	Acer saccharinum	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	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
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown			3	71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	72
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	74
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	75
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	76
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	78
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	79
sycamore	Platanus occidentalis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	81
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	82
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	83
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	84
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	86