

**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  
 10,306    3,979.1    220

**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	23	Increase	RCP45	RCP85	Very Good	13	14	Likely	1	1	
Ash	2			Medium	32	49	No Change	8	10	Good	15	19	Infill	25	25
Hickory	7			Low	34	10	Decrease	19	14	Fair	11	8	Migrate	6	6
Maple	3	Abundant	3	FIA	2		New	13	14	Poor	9	9			
Oak	14	Common	23				Unknown	9	8	Very Poor	11	9			
Pine	2	Rare	36							FIA Only	2	2			
Other	34	Absent	18							Unknown	7	6			
	<b>62</b>		<b>80</b>		<b>82</b>	<b>82</b>		<b>82</b>	<b>82</b>		<b>68</b>	<b>67</b>		<b>32</b>	<b>32</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	63.3	65.0	66.9	67.2	
Average	CCSM85	63.3	65.4	67.9	70.5	
	GFDL45	63.3	67.0	67.8	68.8	
	GFDL85	63.3	66.1	69.1	72.6	
	HAD45	63.3	65.8	68.8	69.9	
	HAD85	63.3	66.1	70.5	74.3	
Growing Season	CCSM45	77.7	79.3	80.7	81.3	
	CCSM85	77.7	79.8	82.1	85.5	
May—Sep	GFDL45	77.7	82.2	82.8	84.7	
	GFDL85	77.7	81.2	84.5	88.9	
	HAD45	77.7	81.1	83.9	84.7	
	HAD85	77.7	81.3	87.5	90.8	
Coldest Month	CCSM45	41.6	43.9	45.0	45.2	
	CCSM85	41.6	44.3	45.5	46.9	
Average	GFDL45	41.6	45.3	45.4	45.5	
	GFDL85	41.6	43.0	44.1	44.7	
	HAD45	41.6	42.6	44.4	45.0	
	HAD85	41.6	43.7	45.3	47.0	
Warmest Month	CCSM45	82.6	83.9	84.7	84.8	
	CCSM85	82.6	84.6	85.5	87.2	
Average	GFDL45	82.6	87.0	87.1	88.5	
	GFDL85	82.6	86.4	88.0	90.9	
	HAD45	82.6	87.0	88.7	88.8	
	HAD85	82.6	87.7	91.4	92.4	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	53.4	55.4	60.8	58.6	
Total	CCSM85	53.4	56.3	59.0	61.9	
	GFDL45	53.4	58.6	65.1	62.1	
	GFDL85	53.4	57.5	61.3	63.2	
	HAD45	53.4	51.4	55.2	58.7	
	HAD85	53.4	55.6	49.0	54.5	
Growing Season	CCSM45	18.4	18.3	18.9	18.6	
	CCSM85	18.4	17.4	16.8	17.5	
May—Sep	GFDL45	18.4	20.1	23.2	21.7	
	GFDL85	18.4	21.0	22.6	22.7	
	HAD45	18.4	17.0	17.5	16.8	
	HAD85	18.4	18.2	13.6	13.8	

**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-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
loblolly pine	Pinus taeda	WDH	High	50.6	2892.6	46.9	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
sugarberry	Celtis laevigata	NDH	Medium	41.6	649.4	19.7	No change	No change	Medium	Abundant	Good	Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	62.3	574.0	7.6	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
green ash	Fraxinus pennsylvanica	WSH	Low	57.3	287.4	5.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	4
water oak	Quercus nigra	WDH	High	48.2	242.5	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	5
winged elm	Ulmus alata	WDL	Medium	54.1	235.4	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
black willow	Salix nigra	NSH	Low	20.3	209.9	14.8	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	7
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	40.1	170.0	3.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
bald cypress	Taxodium distichum	NSH	Medium	18.6	169.3	16.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
southern red oak	Quercus falcata	WDL	Medium	36.8	150.8	3.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
American elm	Ulmus americana	WDH	Medium	35.7	142.5	4.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
willow oak	Quercus phellos	NSL	Low	33.8	138.0	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
pecan	Carya illinoensis	NSH	Low	24.2	127.5	7.5	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	1	13
red maple	Acer rubrum	WDH	High	39.7	117.9	2.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	14
boxelder	Acer negundo	WSH	Low	18.9	113.5	6.0	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	2	15
eastern cottonwood	Populus deltoides	NSH	Low	9.6	109.5	13.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	16
overcup oak	Quercus lyrata	NSL	Medium	16.6	94.9	4.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
white oak	Quercus alba	WDH	Medium	25.5	93.0	2.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
common persimmon	Diospyros virginiana	NSL	Low	27.7	87.7	3.2	No change	Sm. inc.	High	Common	Good	Very Good			1	19
post oak	Quercus stellata	WDH	High	20.7	87.1	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
water hickory	Carya aquatica	NSL	Medium	29.3	80.7	5.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
American hornbeam; musclev	Carpinus caroliniana	WDL	Low	16	77.5	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
blackgum	Nyssa sylvatica	WDL	Medium	22.2	74.7	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
sycamore	Platanus occidentalis	NSL	Low	20.4	67.9	4.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	24
nuttall oak	Quercus texana	NSH	Medium	13	55.3	5.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			0	25
shortleaf pine	Pinus echinata	WDH	High	11.6	53.6	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
mockernut hickory	Carya alba	WDL	Medium	19.5	49.4	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	27
sassafras	Sassafras albidum	WSL	Low	14.5	47.8	2.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	28
slippery elm	Ulmus rubra	WSL	Low	26.7	47.3	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
water elm	Planera aquatica	NSL	Low	8.7	45.7	8.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
shagbark hickory	Carya ovata	WSL	Medium	5	39.5	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	31
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.4	36.9	2.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	32
black cherry	Prunus serotina	WDL	Medium	20	34.7	1.4	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	33
honeylocust	Gleditsia triacanthos	NSH	Low	20.5	31.3	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	34
black oak	Quercus velutina	WDH	High	8.2	28.3	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	35
hackberry	Celtis occidentalis	WDH	Medium	6.4	26.5	6.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	36
black hickory	Carya texana	NDL	High	12.5	24.1	1.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	37
pignut hickory	Carya glabra	WDL	Medium	4.4	22.0	2.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	38
American holly	Ilex opaca	NSL	Medium	10.1	19.3	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	39
flowering dogwood	Cornus florida	WDL	Medium	15.6	17.6	0.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	40
bitternut hickory	Carya cordiformis	WSL	Low	1.9	15.8	8.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +		2	41
cedar elm	Ulmus crassifolia	NDH	Medium	9.3	14.9	5.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	42
swamp chestnut oak	Quercus michauxii	NSL	Low	4	14.5	2.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	43
blackjack oak	Quercus marilandica	NSL	Medium	3.1	14.2	1.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	44
white ash	Fraxinus americana	WDL	Medium	3.9	14.2	3.7	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	45
silver maple	Acer saccharinum	NSH	Low	5.6	12.6	5.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	46
Shumard oak	Quercus shumardii	NSL	Low	5.6	9.3	2.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	47

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Climate Change Atlas Tree Species

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
red mulberry	Morus rubra	NSL	Low	9	9.1	1.1	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
black locust	Robinia pseudoacacia	NDH	Low	6.6	8.6	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
water tupelo	Nyssa aquatica	NSH	Medium	1	8.3	8.5	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	50
waterlocust	Gleditsia aquatica	NSLX	FIA	5.8	7.8	2.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	51
eastern redbud	Cercis canadensis	NSL	Low	3.1	6.8	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	52
pawpaw	Asimina triloba	NSL	Low	0.6	5.0	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
swamp tupelo	Nyssa biflora	NDH	Medium	0.6	3.8	2.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	54
American basswood	Tilia americana	WSL	Medium	3.6	3.7	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	55
yellow-poplar	Liriodendron tulipifera	WDH	High	0.6	3.7	2.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	56
northern red oak	Quercus rubra	WDH	Medium	2.5	3.0	0.8	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	57
Osage-orange	Maclura pomifera	NDH	Medium	0.8	2.7	2.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	58
sourwood	Oxydendrum arboreum	NDL	High	0.6	2.1	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	59
laurel oak	Quercus laurifolia	NDH	Medium	1	1.8	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	60
eastern redcedar	Juniperus virginiana	WDH	Medium	1.1	1.5	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
wild plum	Prunus americana	NSLX	FIA	1	0.9	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	63
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	64
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	65
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
florida maple	Acer barbatum	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	67
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	68
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	73
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	75
black walnut	Juglans nigra	WDH	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	76
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	78
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	80
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82