

**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	52

**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	16	26	Increase	35	40	Very Good	2	2	Likely	1	1
Hickory	8			Medium	35	53	No Change	12	7	Good	25	28	Infill	44	46
Maple	4	Abundant	0	Low	36	10	Decrease	17	17	Fair	11	11	Migrate	7	9
Oak	17	Common	14	FIA	5		New	17	18	Poor	17	15			
Pine	1	Rare	55				Unknown	11	10	Very Poor	9	8			
Other	37	Absent	21							FIA Only	2	2			
	<b>69</b>		<b>90</b>		<b>92</b>	<b>89</b>		<b>92</b>	<b>92</b>	Unknown	6	5			
											<b>72</b>	<b>71</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	58.7	60.5	62.6	62.9	
	CCSM85	58.7	60.9	63.8	66.7	
	GFDL45	58.7	64.2	63.7	64.6	
	GFDL85	58.7	61.5	64.6	68.2	
	HAD45	58.7	61.4	64.5	65.9	
	HAD85	58.7	61.7	66.4	70.2	
Growing Season (May—Sep)	CCSM45	74.8	76.6	78.2	78.9	
	CCSM85	74.8	77.1	80.2	83.9	
	GFDL45	74.8	81.6	80.6	82.1	
	GFDL85	74.8	78.3	81.9	86.3	
	HAD45	74.8	78.2	81.2	82.8	
	HAD85	74.8	78.7	85.1	88.6	
Coldest Month (Average)	CCSM45	33.7	35.7	37.2	37.5	
	CCSM85	33.7	36.6	37.8	39.4	
	GFDL45	33.7	37.8	37.9	38.2	
	GFDL85	33.7	35.6	36.8	37.4	
	HAD45	33.7	35.0	37.2	37.4	
	HAD85	33.7	36.1	38.1	39.9	
Warmest Month (Average)	CCSM45	80.5	82.1	83.2	83.6	
	CCSM85	80.5	83.1	84.5	86.4	
	GFDL45	80.5	84.3	85.2	86.2	
	GFDL85	80.5	84.2	85.9	88.5	
	HAD45	80.5	84.7	86.9	87.6	
	HAD85	80.5	86.3	90.4	91.9	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	48.8	48.2	55.0	52.0	
	CCSM85	48.8	52.1	52.8	55.3	
	GFDL45	48.8	55.6	59.5	60.6	
	GFDL85	48.8	56.2	61.6	64.3	
	HAD45	48.8	47.5	52.0	52.3	
	HAD85	48.8	50.0	46.4	51.2	
Growing Season (May—Sep)	CCSM45	18.7	17.4	18.9	17.6	
	CCSM85	18.7	18.9	16.7	17.8	
	GFDL45	18.7	21.5	22.2	23.2	
	GFDL85	18.7	22.3	23.4	24.4	
	HAD45	18.7	17.0	17.0	16.1	
	HAD85	18.7	17.5	13.4	13.6	

**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
sweetgum	Liquidambar styraciflua	WDH	High	42.7	194.9	10.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	1
boxelder	Acer negundo	WSH	Low	44	152.8	9.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	2
black willow	Salix nigra	NSH	Low	39.2	138.4	15.0	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	21	107.1	8.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	4
sugar maple	Acer saccharum	WDH	High	18.7	101.6	7.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	5
eastern cottonwood	Populus deltoides	NSH	Low	26.8	87.4	10.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	6
green ash	Fraxinus pennsylvanica	WSH	Low	43.6	81.4	4.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	7
American elm	Ulmus americana	WDH	Medium	32.6	77.5	3.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	8
bald cypress	Taxodium distichum	NSH	Medium	10.9	77.0	10.8	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	9
winged elm	Ulmus alata	WDL	Medium	21.6	76.2	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
sassafras	Sassafras albidum	WSL	Low	21	73.5	6.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	11
black locust	Robinia pseudoacacia	NDH	Low	4	71.6	23.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
sugarberry	Celtis laevigata	NDH	Medium	22	56.6	6.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	13
silver maple	Acer saccharinum	NSH	Low	27.7	50.3	10.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	14
sycamore	Platanus occidentalis	NSL	Low	28.6	50.0	6.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	15
water tupelo	Nyssa aquatica	NSH	Medium	1.6	39.9	8.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	16
pin oak	Quercus palustris	NSH	Low	0.3	38.4	10.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	17
white oak	Quercus alba	WDH	Medium	14.4	35.7	5.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	18
hackberry	Celtis occidentalis	WDH	Medium	21.7	35.2	5.4	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	19
red maple	Acer rubrum	WDH	High	26.3	31.9	5.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	20
slippery elm	Ulmus rubra	WSL	Low	29.7	28.1	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
chinkapin oak	Quercus muehlenbergii	NSL	Medium	12.2	25.3	3.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	22
willow oak	Quercus phellos	NSL	Low	9.3	25.1	7.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	23
black oak	Quercus velutina	WDH	High	16.5	23.2	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	24
American beech	Fagus grandifolia	WDH	High	10	22.6	4.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	11.3	20.2	2.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	26
pignut hickory	Carya glabra	WDL	Medium	13.7	19.1	2.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	27
mockernut hickory	Carya alba	WDL	Medium	10.4	18.8	2.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	28
honeylocust	Gleditsia triacanthos	NSH	Low	20.5	18.2	6.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	29
black cherry	Prunus serotina	WDL	Medium	13.8	13.0	2.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	30
paulownia	Paulownia tomentosa	NSL	FIA	4.8	11.2	2.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	31
overcup oak	Quercus lyrata	NSL	Medium	3.6	10.2	1.0	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	32
shagbark hickory	Carya ovata	WSL	Medium	7.4	8.9	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
swamp chestnut oak	Quercus michauxii	NSL	Low	2.4	8.9	0.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	13	8.6	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	35
common persimmon	Diospyros virginiana	NSL	Low	12.6	7.9	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	36
black walnut	Juglans nigra	WDH	Low	5.4	7.5	2.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	37
pecan	Carya illinoensis	NSH	Low	4.1	7.0	0.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	38
red mulberry	Morus rubra	NSL	Low	14.4	6.9	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	39
bitternut hickory	Carya cordiformis	WSL	Low	11.1	6.8	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
nuttall oak	Quercus texana	NSH	Medium	1	6.6	6.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good			0	41
northern red oak	Quercus rubra	WDH	Medium	14.1	5.8	2.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	42
shellbark hickory	Carya laciniosa	NSL	Low	6	5.6	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	43
white ash	Fraxinus americana	WDL	Medium	5.6	5.5	1.2	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	44
water elm	Planera aquatica	NSL	Low	2.1	4.9	1.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	45
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	4.6	4.7	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	46
blackgum	Nyssa sylvatica	WDL	Medium	8.9	4.6	1.2	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	47



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river birch	Betula nigra	NSL	Low	5.1	4.5	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	48
shingle oak	Quercus imbricaria	NDH	Medium	1	4.4	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
loblolly pine	Pinus taeda	WDH	High	0.9	3.8	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	50
post oak	Quercus stellata	WDH	High	1.4	3.3	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	51
pawpaw	Asimina triloba	NSL	Low	6	2.8	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	52
scarlet oak	Quercus coccinea	WDL	Medium	1.2	2.7	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
ailanthus	Ailanthus altissima	NSL	FIA	1	2.2	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
black hickory	Carya texana	NDL	High	5.7	1.6	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
swamp white oak	Quercus bicolor	NSL	Low	1	1.4	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
water hickory	Carya aquatica	NSL	Medium	0.1	1.2	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
flowering dogwood	Cornus florida	WDL	Medium	4.2	1.1	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	58
eastern redcedar	Juniperus virginiana	WDH	Medium	5.7	1.1	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
southern red oak	Quercus falcata	WDL	Medium	5.1	1.0	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	60
butternut	Juglans cinerea	NSLX	FIA	4	1.0	3.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	61
white mulberry	Morus alba	NSL	FIA	1.6	0.8	0.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	62
waterlocust	Gleditsia aquatica	NSLX	FIA	0.9	0.6	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
water oak	Quercus nigra	WDH	High	0.1	0.6	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	64
eastern redbud	Cercis canadensis	NSL	Low	6.5	0.5	0.4	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++	2	65
swamp tupelo	Nyssa biflora	NDH	Medium	0.1	0.3	0.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	66
chestnut oak	Quercus prinus	NDH	High	0.1	0.2	0.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	67
cucumbertree	Magnolia acuminata	NSL	Low	1.5	0.2	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	68
Ohio buckeye	Aesculus glabra	NSL	Low	1.5	0.1	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	69
ash juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	70
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	72
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	73
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +		3	74
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	77
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	78
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	79
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	80
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	81
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	82
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	83
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	84
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	85
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	86
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	87
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	88
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	89
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	90
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	91
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	92

