

**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      335

**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	14	21	Increase	30	35	Very Good	16	17	Likely	1	1
Hickory	6			Medium	26	43	No Change	8	9	Good	16	17	Infill	7	12
Maple	4	Abundant	6	Low	29	8	Decrease	19	13	Fair	6	9	Migrate	0	3
Oak	13	Common	23	FIA	3		New	8	9	Poor	6	5		8	16
Pine	2	Rare	31				Unknown	7	6	Very Poor	10	6			
Other	32	Absent	10							FIA Only	3	3			
	<b>60</b>		<b>70</b>		<b>72</b>	<b>72</b>		<b>72</b>	<b>72</b>	Unknown	4	3			
											<b>61</b>	<b>60</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	57.2	59.1	61.1	61.4	
Average	57.2	59.5	62.0	64.9	
GFDL45	57.2	60.1	62.3	63.3	
GFDL85	57.2	60.2	63.1	66.9	
HAD45	57.2	59.9	62.8	64.3	
HAD85	57.2	60.1	64.8	68.5	
Growing Season	72.7	74.7	76.3	77.0	
May—Sep	72.7	75.2	77.6	81.4	
GFDL45	72.7	76.0	78.8	80.6	
GFDL85	72.7	76.5	79.8	84.6	
HAD45	72.7	75.7	78.4	80.0	
HAD85	72.7	76.1	82.0	85.4	
Coldest Month	33.3	35.6	36.9	37.2	
Average	33.3	36.2	37.3	38.9	
GFDL45	33.3	37.5	37.7	37.9	
GFDL85	33.3	35.2	36.6	37.2	
HAD45	33.3	34.4	36.7	36.8	
HAD85	33.3	35.9	38.0	39.7	
Warmest Month	78.8	81.0	81.9	82.2	
Average	78.8	81.5	82.6	84.5	
GFDL45	78.8	83.4	84.6	85.8	
GFDL85	78.8	83.2	84.8	88.1	
HAD45	78.8	82.3	84.2	84.8	
HAD85	78.8	83.5	86.9	88.3	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	44.8	44.1	48.3	46.5	
Total	44.8	45.8	47.7	48.1	
GFDL45	44.8	49.1	52.0	50.3	
GFDL85	44.8	49.4	55.4	55.3	
HAD45	44.8	43.7	47.8	48.2	
HAD85	44.8	48.4	43.6	46.2	
Growing Season	18.7	17.6	18.8	18.0	
May—Sep	18.7	18.4	17.4	17.7	
GFDL45	18.7	20.5	20.1	20.7	
GFDL85	18.7	20.6	22.6	22.0	
HAD45	18.7	18.0	18.1	17.8	
HAD85	18.7	19.2	15.2	15.3	

**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
black oak	Quercus velutina	WDH	High	85.4	1620.0	13.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
eastern redcedar	Juniperus virginiana	WDH	Medium	81	1438.9	13.4	No change	No change	Medium	Abundant	Good	Good			1	2
post oak	Quercus stellata	WDH	High	86.2	1419.8	12.2	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
white oak	Quercus alba	WDH	Medium	73.5	1384.9	12.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
shortleaf pine	Pinus echinata	WDH	High	33.7	618.1	11.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
black hickory	Carya texana	NDL	High	80.2	581.9	4.9	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	6
northern red oak	Quercus rubra	WDH	Medium	61.4	489.4	6.0	No change	Sm. dec.	High	Common	Good	Fair			1	7
blackjack oak	Quercus marilandica	NSL	Medium	40.2	367.5	6.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
mockernut hickory	Carya alba	WDL	Medium	62	310.7	3.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
southern red oak	Quercus falcata	WDL	Medium	30.2	280.7	6.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
winged elm	Ulmus alata	WDL	Medium	68.1	208.6	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
chinkapin oak	Quercus muehlenbergii	NSL	Medium	40.6	206.9	3.8	No change	No change	Medium	Common	Fair	Fair			1	12
sycamore	Platanus occidentalis	NSL	Low	25.9	196.3	6.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	13
black walnut	Juglans nigra	WDH	Low	40.3	178.6	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
white ash	Fraxinus americana	WDL	Medium	50.3	177.3	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
flowering dogwood	Cornus florida	WDL	Medium	61.3	176.2	2.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	16
blackgum	Nyssa sylvatica	WDL	Medium	39.7	149.8	2.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
sassafras	Sassafras albidum	WSL	Low	42.5	128.7	1.9	Sm. dec.	No change	Medium	Common	Poor	Fair			1	18
American elm	Ulmus americana	WDH	Medium	39.9	112.8	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
bitternut hickory	Carya cordiformis	WSL	Low	25.7	99.9	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
black cherry	Prunus serotina	WDL	Medium	31.5	92.3	2.0	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
ashe juniper	Juniperus ashei	NDH	High	6.2	92.2	11.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			0	22
common persimmon	Diospyros virginiana	NSL	Low	33.6	88.9	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
slippery elm	Ulmus rubra	WSL	Low	31.2	78.1	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
hackberry	Celtis occidentalis	WDH	Medium	25.7	77.7	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	25
Shumard oak	Quercus shumardii	NSL	Low	17.6	66.1	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	26
eastern redbud	Cercis canadensis	NSL	Low	33.6	60.9	1.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
red maple	Acer rubrum	WDH	High	11.9	57.3	2.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	28
sweetgum	Liquidambar styraciflua	WDH	High	6.1	53.2	4.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	29
honeylocust	Gleditsia triacanthos	NSH	Low	15	47.4	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	30
red mulberry	Morus rubra	NSL	Low	21.9	46.0	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	31
sugar maple	Acer saccharum	WDH	High	9.6	40.3	2.8	Sm. dec.	No change	High	Rare	Poor	Fair			1	32
scarlet oak	Quercus coccinea	WDL	Medium	7.5	32.6	2.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
florida maple	Acer barbatum	NSL	Low	7.5	31.1	3.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	34
green ash	Fraxinus pennsylvanica	WSH	Low	12.2	27.5	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	2	25.3	12.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	36
boxelder	Acer negundo	WSH	Low	5	24.0	4.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	37
shagbark hickory	Carya ovata	WSL	Medium	9.2	21.3	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	38
Ohio buckeye	Aesculus glabra	NSL	Low	4.9	16.4	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	9.9	15.3	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	11	14.9	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	41
wild plum	Prunus americana	NSLX	FIA	4.3	13.7	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
serviceberry	Amelanchier spp.	NSL	Low	9.7	11.6	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
Osage-orange	Maclura pomifera	NDH	Medium	3.7	11.1	2.7	No change	Lg. inc.	High	Rare	Fair	Good		Infill ++	2	44
blue ash	Fraxinus quadrangulata	NSL	Low	5	10.0	1.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	45
sugarberry	Celtis laevigata	NDH	Medium	5.7	7.5	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	46
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	5.5	7.2	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	1	47



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pignut hickory	<i>Carya glabra</i>	WDL	Medium	5.4	7.0	0.9	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	48
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	3	5.4	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	49
loblolly pine	<i>Pinus taeda</i>	WDH	High	0.5	4.2	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	50
swamp chestnut oak	<i>Quercus michauxii</i>	NSL	Low	2.5	4.0	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
pawpaw	<i>Asimina triloba</i>	NSL	Low	3.9	4.0	1.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	52
butternut	<i>Juglans cinerea</i>	NSLX	FIA	0.3	2.3	0.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	53
American basswood	<i>Tilia americana</i>	WSL	Medium	3	2.1	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	54
water oak	<i>Quercus nigra</i>	WDH	High	0.6	1.4	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
bur oak	<i>Quercus macrocarpa</i>	NDH	Medium	0.7	1.0	0.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	56
shellbark hickory	<i>Carya laciniosa</i>	NSL	Low	0.8	0.7	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
waterlocust	<i>Gleditsia aquatica</i>	NSLX	FIA	0.5	0.7	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	58
river birch	<i>Betula nigra</i>	NSL	Low	0.6	0.7	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	59
American holly	<i>Ilex opaca</i>	NSL	Medium	1	0.6	0.6	Very Lg. dec.	No change	Medium	Rare	Lost	Poor		Infill +	2	60
longleaf pine	<i>Pinus palustris</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
yellow birch	<i>Betula alleghaniensis</i>	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	63
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	65
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	66
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	67
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	68
willow oak	<i>Quercus phellos</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	71
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	72