

**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	9,813.8	3,789.1	363

**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	21	26	Increase	23	30	Very Good	8	12	Likely	1	1
Hickory	5			Medium	28	46	No Change	11	8	Good	19	21	Infill	6	8
Maple	6	Abundant	6	Low	35	14	Decrease	35	31	Fair	13	9	Migrate	2	6
Oak	14	Common	29	FIA	6		New	11	12	Poor	10	11			
Pine	5	Rare	40				Unknown	10	9	Very Poor	18	15			
Other	42	Absent	15							FIA Only	2	2			
	<b>75</b>		<b>90</b>		<b>90</b>	<b>86</b>		<b>90</b>	<b>90</b>	Unknown	4	3			
											<b>74</b>	<b>73</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.1	57.0	59.3	59.5	
	CCSM85	55.1	57.4	59.9	63.0	
	GFDL45	55.1	57.8	60.6	61.4	
	GFDL85	55.1	58.2	61.6	65.3	
	HAD45	55.1	57.6	60.9	62.3	
Growing Season (May—Sep)	CCSM45	70.1	71.9	74.1	74.7	
	CCSM85	70.1	72.4	75.0	79.0	
	GFDL45	70.1	73.3	76.8	78.0	
	GFDL85	70.1	73.9	78.2	82.3	
	HAD45	70.1	73.3	76.6	78.3	
Coldest Month (Average)	CCSM45	31.9	33.6	34.9	35.3	
	CCSM85	31.9	34.6	35.4	36.9	
	GFDL45	31.9	35.8	35.8	36.4	
	GFDL85	31.9	34.0	35.1	35.9	
	HAD45	31.9	32.3	34.5	34.9	
Warmest Month (Average)	CCSM45	75.3	77.3	78.6	78.9	
	CCSM85	75.3	77.7	79.4	81.2	
	GFDL45	75.3	78.9	81.0	81.8	
	GFDL85	75.3	79.6	82.5	84.7	
	HAD45	75.3	79.3	81.9	82.9	
HAD85	75.3	80.8	85.2	87.4		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	46.5	48.9	52.6	52.5	
	CCSM85	46.5	52.4	53.8	57.4	
	GFDL45	46.5	51.4	52.6	56.5	
	GFDL85	46.5	50.1	54.2	57.0	
	HAD45	46.5	46.4	48.6	48.7	
Growing Season (May—Sep)	CCSM45	21.2	21.9	23.2	22.8	
	CCSM85	21.2	23.2	22.1	23.5	
	GFDL45	21.2	23.7	22.7	23.9	
	GFDL85	21.2	22.4	23.0	23.7	
	HAD45	21.2	21.4	19.7	20.2	
HAD85	21.2	21.0	17.7	18.5		

**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
yellow-poplar	Liriodendron tulipifera	WDH	High	93.3	1498.0	10.6	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	96.8	1218.9	8.4	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
white oak	Quercus alba	WDH	Medium	91.8	1215.6	9.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	3
chestnut oak	Quercus prinus	NDH	High	77.1	818.9	7.0	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
American beech	Fagus grandifolia	WDH	High	83.8	732.4	5.7	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	5
sugar maple	Acer saccharum	WDH	High	84.8	509.1	4.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	6
Virginia pine	Pinus virginiana	NDH	High	55.5	499.1	6.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
scarlet oak	Quercus coccinea	WDL	Medium	74.9	450.4	4.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	8
pignut hickory	Carya glabra	WDL	Medium	83.1	403.3	3.4	No change	Sm. dec.	Medium	Common	Fair	Poor			1	9
sourwood	Oxydendrum arboreum	NDL	High	91.2	381.2	2.9	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	10
black oak	Quercus velutina	WDH	High	74.7	369.4	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
blackgum	Nyssa sylvatica	WDL	Medium	88.4	308.8	2.6	No change	Sm. inc.	High	Common	Good	Very Good			1	12
mockernut hickory	Carya alba	WDL	Medium	69.1	283.9	3.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
northern red oak	Quercus rubra	WDH	Medium	56.2	223.5	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
eastern white pine	Pinus strobus	WDH	High	24.4	194.9	6.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	15
sassafras	Sassafras albidum	WSL	Low	62.8	174.0	1.9	No change	No change	Medium	Common	Fair	Fair			1	16
sycamore	Platanus occidentalis	NSL	Low	24.4	172.0	3.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
eastern hemlock	Tsuga canadensis	NSH	High	29.2	168.4	4.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	18
black locust	Robinia pseudoacacia	NDH	Low	47.5	161.1	2.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	19
shagbark hickory	Carya ovata	WSL	Medium	48.6	155.1	2.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
flowering dogwood	Cornus florida	WDL	Medium	76.6	145.9	1.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	21
pitch pine	Pinus rigida	NSH	High	33.1	143.5	3.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	22
American basswood	Tilia americana	WSL	Medium	37.8	135.4	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	23
shortleaf pine	Pinus echinata	WDH	High	35.1	135.1	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
white ash	Fraxinus americana	WDL	Medium	46.7	132.6	2.0	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	25
sweet birch	Betula lenta	NDH	High	48.6	124.4	1.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	26
eastern redbud	Cercis canadensis	NSL	Low	50.6	93.4	1.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	27
black cherry	Prunus serotina	WDL	Medium	24.1	90.3	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	28
green ash	Fraxinus pennsylvanica	WSH	Low	28.2	85.5	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	35.1	70.6	1.3	No change	Sm. inc.	Medium	Common	Fair	Good			1	30
cucumbertree	Magnolia acuminata	NSL	Low	30.4	68.7	1.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	31
black walnut	Juglans nigra	WDH	Low	29.9	68.2	1.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	32
sweetgum	Liquidambar styraciflua	WDH	High	18.5	68.1	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	33
slippery elm	Ulmus rubra	WSL	Low	35.3	59.6	1.1	No change	Lg. inc.	Medium	Common	Fair	Very Good			1	34
southern red oak	Quercus falcata	WDL	Medium	21	56.7	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	35
bitternut hickory	Carya cordiformis	WSL	Low	28.3	48.6	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	36
yellow buckeye	Aesculus flava	NSL	Low	17.4	41.1	1.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	37
post oak	Quercus stellata	WDH	High	16.6	40.6	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	38
river birch	Betula nigra	NSL	Low	7.7	37.7	2.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	39
American elm	Ulmus americana	WDH	Medium	20.3	37.6	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	40
eastern redcedar	Juniperus virginiana	WDH	Medium	12.4	37.6	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	41
chinkapin oak	Quercus muehlenbergii	NSL	Medium	11.9	35.5	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	42
serviceberry	Amelanchier spp.	NSL	Low	25.2	35.1	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
red mulberry	Morus rubra	NSL	Low	20.1	27.8	0.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	44
paulownia	Paulownia tomentosa	NSL	FIA	4.2	25.3	4.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	45
bigleaf magnolia	Magnolia macrophylla	NSL	Low	10.4	24.0	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
loblolly pine	Pinus taeda	WDH	High	0.4	20.4	7.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	47



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eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.6	19.9	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	48
boxelder	Acer negundo	WSH	Low	5.3	16.4	2.4	No change	No change	High	Rare	Fair	Fair			1	49
shellbark hickory	Carya laciniosa	NSL	Low	13.2	16.3	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	50
hackberry	Celtis occidentalis	WDH	Medium	3.3	15.4	2.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	51
butternut	Juglans cinerea	NSLX	FIA	6.6	12.2	1.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	52
ailanthus	Ailanthus altissima	NSL	FIA	3.1	8.8	1.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	53
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	6.6	8.6	0.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	54
Shumard oak	Quercus shumardii	NSL	Low	2	7.8	3.8	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	55
winged elm	Ulmus alata	WDL	Medium	8.6	6.6	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	56
American holly	Ilex opaca	NSL	Medium	5.1	6.2	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
pawpaw	Asimina triloba	NSL	Low	7.6	5.9	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	58
silver maple	Acer saccharinum	NSH	Low	2	5.6	2.7	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	59
bur oak	Quercus macrocarpa	NDH	Medium	1	5.0	4.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	60
black maple	Acer nigrum	NSH	Low	0.1	4.7	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	61
pin oak	Quercus palustris	NSH	Low	2	4.0	2.0	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	62
bigtooth aspen	Populus grandidentata	NSL	Medium	3.5	3.9	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
shingle oak	Quercus imbricaria	NDH	Medium	0.4	3.8	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	64
Ohio buckeye	Aesculus glabra	NSL	Low	0.6	3.7	0.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
black willow	Salix nigra	NSH	Low	2.1	3.4	0.6	Lg. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	66
American chestnut	Castanea dentata	NSLX	FIA	3.2	3.2	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	67
Osage-orange	Maclura pomifera	NDH	Medium	0.3	2.9	0.3	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	68
common persimmon	Diospyros virginiana	NSL	Low	2	1.9	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	69
Siberian elm	Ulmus pumila	NDH	FIA	1	1.4	1.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	70
blackjack oak	Quercus marilandica	NSL	Medium	0.5	0.8	0.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	71
water oak	Quercus nigra	WDH	High	1	0.7	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	72
white mulberry	Morus alba	NSL	FIA	1	0.7	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	73
striped maple	Acer pensylvanicum	NSL	Medium	1	0.6	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	74
black ash	Fraxinus nigra	WSH	Medium	0.3	0.5	0.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	75
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	76
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	78
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	79
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	80
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	81
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	83
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	84
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	86
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	87
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	88
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	89
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	90