

**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	9,683.1	3,738.7	84

**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	11	23	Increase	20	22	Very Good	0	0
Hickory	6			Medium	27	39	No Change	12	12	Good	18	22
Maple	5	Abundant	0	Low	32	9	Decrease	24	22	Fair	17	14
Oak	13	Common	20	FIA	2		New	9	9	Poor	12	12
Pine	3	Rare	38				Unknown	7	7	Very Poor	7	6
Other	29	Absent	14							FIA Only	1	1
	<b>58</b>		<b>72</b>		<b>72</b>	<b>71</b>		<b>72</b>	<b>72</b>	Unknown	5	5
											<b>60</b>	<b>60</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.0	56.9	58.9	59.2	
	CCSM85	55.0	57.3	59.8	62.7	
	GFDL45	55.0	60.6	60.3	61.1	
	GFDL85	55.0	58.0	61.2	65.1	
	HAD45	55.0	57.8	61.1	62.7	
HAD85	55.0	58.2	62.9	67.0		
Growing Season (May—Sep)	CCSM45	71.9	73.9	75.4	76.2	
	CCSM85	71.9	74.4	76.9	80.4	
	GFDL45	71.9	78.7	78.0	79.4	
	GFDL85	71.9	75.4	79.3	84.1	
	HAD45	71.9	75.2	78.3	80.2	
HAD85	71.9	75.6	81.7	85.8		
Coldest Month Average	CCSM45	28.4	29.9	31.4	31.7	
	CCSM85	28.4	31.3	32.3	33.8	
	GFDL45	28.4	33.1	33.3	33.9	
	GFDL85	28.4	31.3	32.5	33.3	
	HAD45	28.4	30.1	32.6	32.7	
HAD85	28.4	31.2	33.6	35.4		
Warmest Month Average	CCSM45	77.7	79.6	80.6	81.3	
	CCSM85	77.7	80.5	82.2	84.0	
	GFDL45	77.7	80.9	82.3	83.3	
	GFDL85	77.7	81.4	83.5	86.3	
	HAD45	77.7	81.5	83.8	84.7	
HAD85	77.7	83.2	87.2	89.3		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.5	41.9	46.9	45.7	
	CCSM85	43.5	45.4	46.2	48.4	
	GFDL45	43.5	50.4	52.9	54.5	
	GFDL85	43.5	49.3	55.4	57.2	
	HAD45	43.5	43.9	46.9	46.8	
HAD85	43.5	45.2	43.6	47.3		
Growing Season (May—Sep)	CCSM45	18.8	17.5	18.9	17.9	
	CCSM85	18.8	18.4	17.8	18.4	
	GFDL45	18.8	21.8	21.9	22.6	
	GFDL85	18.8	21.2	22.4	22.8	
	HAD45	18.8	17.9	17.1	17.0	
HAD85	18.8	18.1	15.0	15.1		

**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
shagbark hickory	Carya ovata	WSL	Medium	68.8	146.4	7.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	1
hackberry	Celtis occidentalis	WDH	Medium	69	145.4	7.5	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	2
white ash	Fraxinus americana	WDL	Medium	40.8	143.6	6.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	3
red maple	Acer rubrum	WDH	High	46.2	140.4	8.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	4
white oak	Quercus alba	WDH	Medium	42.2	132.4	8.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	5
green ash	Fraxinus pennsylvanica	WSH	Low	82.4	130.1	7.0	No change	No change	Medium	Common	Fair	Fair			1	6
sugar maple	Acer saccharum	WDH	High	30.3	124.6	7.4	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	7
American elm	Ulmus americana	WDH	Medium	86.1	108.8	5.0	No change	Sm. inc.	Medium	Common	Fair	Good			1	8
shingle oak	Quercus imbricaria	NDH	Medium	62.1	98.2	5.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	9
silver maple	Acer saccharinum	NSH	Low	42.4	97.6	14.3	No change	No change	High	Common	Good	Good			1	10
pin oak	Quercus palustris	NSH	Low	45.3	94.0	7.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	11
pignut hickory	Carya glabra	WDL	Medium	42	85.1	5.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
sassafras	Sassafras albidum	WSL	Low	49.4	81.1	4.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
sycamore	Platanus occidentalis	NSL	Low	35.4	73.4	6.1	No change	No change	Medium	Common	Fair	Fair			1	14
black cherry	Prunus serotina	WDL	Medium	60.8	62.1	4.4	No change	No change	Low	Common	Poor	Poor			0	15
honeylocust	Gleditsia triacanthos	NSH	Low	37.3	54.8	9.5	Sm. dec.	No change	High	Common	Fair	Good			1	16
black walnut	Juglans nigra	WDH	Low	38.4	54.0	5.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
winged elm	Ulmus alata	WDL	Medium	5.2	53.3	28.2	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	18
black oak	Quercus velutina	WDH	High	53.6	51.1	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
eastern cottonwood	Populus deltoides	NSH	Low	20.5	50.4	8.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	20
river birch	Betula nigra	NSL	Low	32	49.7	7.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	21
boxelder	Acer negundo	WSL	Low	27.8	40.2	3.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	22
bitternut hickory	Carya cordiformis	WSL	Low	34.2	32.9	4.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	23
mockernut hickory	Carya alba	WDL	Medium	39.4	29.6	3.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	24
eastern redcedar	Juniperus virginiana	WDH	Medium	26.9	16.9	3.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	25
common persimmon	Diospyros virginiana	NSL	Low	35.5	15.8	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	26
sweetgum	Liquidambar styraciflua	WDH	High	18.4	15.4	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
red mulberry	Morus rubra	NSL	Low	22.7	13.9	1.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
eastern redbud	Cercis canadensis	NSL	Low	16.7	13.9	1.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	29
flowering dogwood	Cornus florida	WDL	Medium	10.2	13.3	2.2	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	30
Osage-orange	Maclura pomifera	NDH	Medium	7.7	11.7	7.9	No change	No change	High	Rare	Fair	Fair		Infill +	2	31
slippery elm	Ulmus rubra	WSL	Low	31.1	11.6	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
Shumard oak	Quercus shumardii	NSL	Low	6	10.4	3.1	No change	No change	High	Rare	Fair	Fair		Infill +	2	33
northern red oak	Quercus rubra	WDH	Medium	11	9.6	2.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	3.6	9.1	3.8	No change	No change	High	Rare	Fair	Fair		Infill +	2	35
blackjack oak	Quercus marilandica	NSL	Medium	1	8.8	8.5	No change	Sm. inc.	High	Rare	Fair	Good			2	36
white mulberry	Morus alba	NSL	FIA	5.2	8.4	2.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
black willow	Salix nigra	NSH	Low	1	8.3	0.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	38
post oak	Quercus stellata	WDH	High	13.8	7.6	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	39
bur oak	Quercus macrocarpa	NDH	Medium	13.2	6.5	1.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	40
blackgum	Nyssa sylvatica	WDL	Medium	7.4	5.8	2.7	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	41
shellbark hickory	Carya laciniosa	NSL	Low	16.2	5.8	5.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	42
southern red oak	Quercus falcata	WDL	Medium	1	5.7	5.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	43
swamp white oak	Quercus bicolor	NSL	Low	13.4	5.4	3.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	14.7	2.5	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	45
chinkapin oak	Quercus muehlenbergii	NSL	Medium	5.2	1.9	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
shortleaf pine	Pinus echinata	WDH	High	4.1	1.8	6.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	47



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sugarberry	Celtis laevigata	NDH	Medium	6.7	1.5	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	48	
loblolly pine	Pinus taeda	WDH	High	1.6	1.5	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	49	
pawpaw	Asimina triloba	NSL	Low	5.7	1.1	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	50	
American basswood	Tilia americana	WSL	Medium	4.1	1.1	4.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0	51	
red pine	Pinus resinosa	NSH	Medium	0.1	1.0	0.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor					0	52
pecan	Carya illinoensis	NSH	Low	8.3	0.9	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +		2	53	
northern catalpa	Catalpa speciosa	NSHX	FIA	1.6	0.4	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only					0	54
yellow-poplar	Liriodendron tulipifera	WDH	High	1	0.3	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good					2	55
black locust	Robinia pseudoacacia	NDH	Low	1.6	0.3	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good					2	56
black maple	Acer nigrum	NSH	Low	0.4	0.1	0.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor					0	57
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	3.8	0.1	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good					2	58
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	59
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	60
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +			3	61
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +			3	62
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++			3	63
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	64
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown					0	65
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown					0	66
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	67
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	68
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +			3	69
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++			3	70
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++			3	71
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat					3	72