

**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	9,412.7	3,634.3	25

**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	1			High	2	12	Increase	4	6	Very Good	1	1	Likely	4	3
Hickory	1			Medium	13	18	No Change	4	5	Good	3	3	Infill	11	14
Maple	2	Abundant	0	Low	18	4	Decrease	12	9	Fair	3	6	Migrate	3	6
Oak	3	Common	5	FIA	2		New	11	10	Poor	6	5		<b>18</b>	<b>23</b>
Pine	0	Rare	17				Unknown	4	5	Very Poor	7	5			
Other	15	Absent	13					<b>35</b>	<b>35</b>	FIA Only	1	1			
	<b>22</b>		<b>35</b>		<b>35</b>	<b>34</b>				Unknown	2	3			
											<b>23</b>	<b>24</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	51.7	53.5	55.5	56.3	
	CCSM85	51.7	54.1	56.6	59.4	
	GFDL45	51.7	57.9	56.5	57.9	
	GFDL85	51.7	54.5	57.6	61.9	
	HAD45	51.7	54.2	57.4	58.5	
	HAD85	51.7	54.8	59.5	63.0	
Growing Season (May—Sep)	CCSM45	70.4	72.6	74.7	75.6	
	CCSM85	70.4	73.4	75.9	79.1	
	GFDL45	70.4	78.6	76.5	78.6	
	GFDL85	70.4	74.2	77.7	83.2	
	HAD45	70.4	72.6	75.0	76.2	
	HAD85	70.4	73.3	78.2	81.3	
Coldest Month Average	CCSM45	22.5	24.6	25.8	26.7	
	CCSM85	22.5	24.9	26.0	27.8	
	GFDL45	22.5	25.8	26.4	26.6	
	GFDL85	22.5	24.9	26.4	27.7	
	HAD45	22.5	24.8	27.9	27.7	
	HAD85	22.5	27.5	30.7	32.9	
Warmest Month Average	CCSM45	77.1	79.4	81.2	81.8	
	CCSM85	77.1	81.1	82.7	84.6	
	GFDL45	77.1	80.8	82.1	83.6	
	GFDL85	77.1	81.4	82.8	86.8	
	HAD45	77.1	79.0	80.9	81.5	
	HAD85	77.1	80.9	83.6	85.5	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	31.5	32.2	32.3	31.0	
	CCSM85	31.5	31.8	31.7	32.9	
	GFDL45	31.5	35.6	37.9	36.3	
	GFDL85	31.5	35.5	39.4	37.6	
	HAD45	31.5	35.5	35.8	36.0	
	HAD85	31.5	33.9	32.9	36.1	
Growing Season (May—Sep)	CCSM45	20.1	19.9	19.4	18.7	
	CCSM85	20.1	19.0	18.4	19.2	
	GFDL45	20.1	22.9	23.6	21.9	
	GFDL85	20.1	22.5	24.4	22.5	
	HAD45	20.1	21.3	22.0	21.9	
	HAD85	20.1	20.7	19.1	19.1	

**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
American elm	Ulmus americana	WDH	Medium	38.8	96.9	14.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	1
eastern redcedar	Juniperus virginiana	WDH	Medium	20.2	73.0	20.4	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	2	2
bur oak	Quercus macrocarpa	NDH	Medium	27.6	72.8	19.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	3
hackberry	Celtis occidentalis	WDH	Medium	31.1	53.7	11.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	4
red mulberry	Morus rubra	NSL	Low	34.5	51.1	8.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	5
green ash	Fraxinus pennsylvanica	WSH	Low	31.3	48.9	12.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	6
honeylocust	Gleditsia triacanthos	NSH	Low	23.8	37.1	10.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	7
eastern cottonwood	Populus deltoides	NSH	Low	12.7	30.7	38.5	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	8
black willow	Salix nigra	NSH	Low	10.1	29.7	32.3	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	9
black locust	Robinia pseudoacacia	NDH	Low	4.2	26.6	100.0	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	10
Siberian elm	Ulmus pumila	NDH	FIA	6.5	23.2	35.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	11
Osage-orange	Maclura pomifera	NDH	Medium	15	23.0	10.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	12
black walnut	Juglans nigra	WDH	Low	14.2	14.7	3.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	13
slippery elm	Ulmus rubra	WSL	Low	12.5	10.4	6.0	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	14
American basswood	Tilia americana	WSL	Medium	6.4	9.3	13.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	15
chinkapin oak	Quercus muehlenbergii	NSL	Medium	7.1	8.9	11.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	16
boxelder	Acer negundo	WSH	Low	3.3	4.4	12.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	17
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	3.6	3.6	3.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	18
silver maple	Acer saccharinum	NSH	Low	1.9	2.7	4.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	19
bitternut hickory	Carya cordiformis	WSL	Low	11.1	2.5	2.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	20
black oak	Quercus velutina	WDH	High	2.9	2.1	5.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	21
black cherry	Prunus serotina	WDL	Medium	2.2	1.2	2.3	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	22
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	23
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	24
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	25
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	26
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	27
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	28
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	New Habitat	Unknown	High	Absent	New Habitat	Unknown	Likely +		3	29
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	30
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	31
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	32
northern red oak	Quercus rubra	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	33
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	34
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	35