

**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	21

**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	6	8	Increase	5	5	Very Good	0	0	Likely	1	1
Hickory	0			Medium	8	21	No Change	3	4	Good	3	3	Infill	9	10
Maple	1	Abundant	0	Low	18	3	Decrease	5	4	Fair	3	3	Migrate	6	6
Oak	1	Common	3	FIA	1		New	14	14	Poor	6	7		<b>16</b>	<b>17</b>
Pine	0	Rare	11				Unknown	6	6	Very Poor	1	0			
Other	11	Absent	18					<b>33</b>	<b>33</b>	FIA Only	0	0			
	<b>14</b>		<b>32</b>		<b>33</b>	<b>32</b>				Unknown	5	5			
											<b>18</b>	<b>18</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	55.5	57.4	59.3	59.8	
	CCSM85	55.5	57.9	60.0	62.8	
	GFDL45	55.5	61.7	60.5	61.7	
	GFDL85	55.5	58.3	61.3	65.5	
	HAD45	55.5	58.0	60.9	61.9	
HAD85	55.5	58.4	63.2	66.1		
Growing Season (May—Sep)	CCSM45	73.5	75.9	77.8	78.5	
	CCSM85	73.5	76.5	78.7	81.9	
	GFDL45	73.5	81.9	79.7	81.9	
	GFDL85	73.5	77.3	80.7	86.1	
	HAD45	73.5	75.5	77.8	78.7	
HAD85	73.5	76.3	81.4	83.7		
Coldest Month Average	CCSM45	28.4	30.3	31.5	32.3	
	CCSM85	28.4	30.7	31.4	33.1	
	GFDL45	28.4	32.1	32.4	32.6	
	GFDL85	28.4	30.3	31.6	32.6	
	HAD45	28.4	30.3	32.7	32.6	
HAD85	28.4	32.2	34.7	36.4		
Warmest Month Average	CCSM45	80.6	83.1	84.5	85.1	
	CCSM85	80.6	84.1	85.4	87.3	
	GFDL45	80.6	84.7	86.0	87.6	
	GFDL85	80.6	85.1	86.4	90.6	
	HAD45	80.6	82.5	84.1	84.6	
HAD85	80.6	84.5	86.9	88.3		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	31.5	30.8	31.5	30.3	
	CCSM85	31.5	32.1	31.7	33.3	
	GFDL45	31.5	34.3	36.7	35.1	
	GFDL85	31.5	35.0	40.1	37.3	
	HAD45	31.5	34.8	34.0	35.1	
HAD85	31.5	32.7	30.5	34.5		
Growing Season (May—Sep)	CCSM45	19.4	17.7	18.2	17.3	
	CCSM85	19.4	18.9	18.2	19.4	
	GFDL45	19.4	21.3	22.1	21.1	
	GFDL85	19.4	21.9	24.8	22.7	
	HAD45	19.4	20.7	21.6	21.2	
HAD85	19.4	19.3	17.6	18.7		

**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
Osage-orange	Maclura pomifera	NDH	Medium	27	116.1	33.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
green ash	Fraxinus pennsylvanica	WSH	Low	29.4	73.1	13.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	2
red mulberry	Morus rubra	NSL	Low	30.7	69.9	14.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	3
honeylocust	Gleditsia triacanthos	NSH	Low	21.2	44.7	16.8	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	4
American elm	Ulmus americana	WDH	Medium	24.1	38.0	10.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	5
hackberry	Celtis occidentalis	WDH	Medium	23.5	37.2	12.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	6
Siberian elm	Ulmus pumila	NDH	FIA	8.7	34.6	38.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	7
eastern redcedar	Juniperus virginiana	WDH	Medium	15.8	24.2	11.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	8
eastern cottonwood	Populus deltoides	NSH	Low	4.7	19.9	12.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	9
black walnut	Juglans nigra	WDH	Low	9.9	16.1	11.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	10
bur oak	Quercus macrocarpa	NDH	Medium	6.5	8.7	12.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	11
boxelder	Acer negundo	WSH	Low	11.3	4.6	5.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	12
black willow	Salix nigra	NSH	Low	4	2.4	2.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	13
eastern redbud	Cercis canadensis	NSL	Low	2.9	1.1	3.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	14
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	15
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	16
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	17
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	18
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	19
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	20
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	21
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	22
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	23
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	24
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	25
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	26
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	27
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	28
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	29
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	30
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	31
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	32
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	33