

**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    5,653.7    2,182.9      217

**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	14	Increase	13	13	Very Good	3	3	Likely	0	0
Hickory	0			Medium	21	28	No Change	7	6	Good	12	11	Infill	6	6
Maple	5	Abundant	8	Low	15	10	Decrease	11	12	Fair	9	10	Migrate	5	12
Oak	1	Common	13	FIA	3		New	19	19	Poor	3	2		<b>11</b>	<b>18</b>
Pine	4	Rare	13				Unknown	3	3	Very Poor	4	2			
Other	21	Absent	19							FIA Only	2	2			
	<b>34</b>		<b>53</b>		<b>53</b>	<b>52</b>		<b>53</b>	<b>53</b>	Unknown	0	0			
											<b>33</b>	<b>30</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	41.3	42.9	46.2	46.0	
	CCSM85	41.3	43.9	47.0	50.6	
	GFDL45	41.3	44.6	47.8	49.3	
	GFDL85	41.3	45.1	49.0	54.4	
	HAD45	41.3	44.8	48.1	50.0	
HAD85	41.3	45.1	49.2	55.4		
Growing Season May—Sep	CCSM45	59.1	60.5	62.8	62.9	
	CCSM85	59.1	61.1	63.8	67.5	
	GFDL45	59.1	63.6	67.9	70.2	
	GFDL85	59.1	64.4	69.3	75.5	
	HAD45	59.1	62.2	64.4	66.8	
HAD85	59.1	62.1	65.8	71.6		
Coldest Month Average	CCSM45	14.3	16.0	18.9	18.2	
	CCSM85	14.3	16.7	18.9	21.7	
	GFDL45	14.3	16.1	18.3	18.9	
	GFDL85	14.3	17.1	18.9	21.9	
	HAD45	14.3	16.4	20.6	21.0	
HAD85	14.3	19.1	21.7	26.9		
Warmest Month Average	CCSM45	65.4	67.2	68.8	69.0	
	CCSM85	65.4	68.0	69.7	71.6	
	GFDL45	65.4	70.5	72.5	74.0	
	GFDL85	65.4	71.2	73.8	76.6	
	HAD45	65.4	68.7	69.5	71.4	
HAD85	65.4	68.8	70.8	74.7		

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	32.1	33.2	33.5	33.4	
	CCSM85	32.1	32.7	32.6	34.0	
	GFDL45	32.1	34.2	36.2	35.9	
	GFDL85	32.1	34.0	37.3	37.9	
	HAD45	32.1	33.8	35.4	34.8	
HAD85	32.1	34.7	36.1	37.8		
Growing Season May—Sep	CCSM45	15.6	16.2	15.6	15.5	
	CCSM85	15.6	15.4	14.8	14.5	
	GFDL45	15.6	16.0	17.1	16.9	
	GFDL85	15.6	16.5	17.0	16.5	
	HAD45	15.6	15.9	15.0	15.0	
HAD85	15.6	16.3	14.4	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-DGP30 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
northern white-cedar	Thuja occidentalis	WSH	High	76.6	1632.5	17.4	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
sugar maple	Acer saccharum	WDH	High	69.8	1579.4	17.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	96.2	1558.7	11.9	No change	No change	High	Abundant	Very Good	Very Good			1	3
jack pine	Pinus banksiana	NSH	Medium	32.4	874.5	17.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
balsam fir	Abies balsamea	NDH	High	93.7	782.1	6.4	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	5
red pine	Pinus resinosa	NSH	Medium	38.4	673.9	10.4	Sm. inc.	No change	Low	Abundant	Good	Fair			1	6
black spruce	Picea mariana	NSH	High	71.9	613.6	6.4	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
eastern white pine	Pinus strobus	WDH	High	56.3	567.2	6.9	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	8
American beech	Fagus grandifolia	WDH	High	61	478.1	5.6	No change	No change	Medium	Common	Fair	Fair			1	9
quaking aspen	Populus tremuloides	WDH	High	49.1	436.5	6.4	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	10
eastern hemlock	Tsuga canadensis	NSH	High	45.8	423.2	7.9	No change	Sm. dec.	Low	Common	Poor	Poor			0	11
paper birch	Betula papyrifera	WDH	High	72.5	392.1	4.1	No change	No change	Medium	Common	Fair	Fair			1	12
tamarack (native)	Larix laricina	NSH	High	36.6	277.1	5.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
white spruce	Picea glauca	NSL	Medium	56.1	232.2	3.2	No change	No change	Medium	Common	Fair	Fair			1	14
yellow birch	Betula alleghaniensis	NDL	High	54.3	209.8	2.9	No change	No change	Medium	Common	Fair	Fair			1	15
bigtooth aspen	Populus grandidentata	NSL	Medium	18.3	176.0	5.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
black cherry	Prunus serotina	WDL	Medium	36.7	170.9	3.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
balsam poplar	Populus balsamifera	NSH	Medium	25.7	162.7	4.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
black ash	Fraxinus nigra	WSH	Medium	35.3	89.9	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
silver maple	Acer saccharinum	NSH	Low	1.8	88.4	50.0	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	20
northern red oak	Quercus rubra	WDH	Medium	6.4	50.9	6.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
peachleaf willow	Salix amygdaloides	NSLX	FIA	9.3	36.7	3.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	22
pin cherry	Prunus pennsylvanica	NSL	Low	10.6	33.0	2.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	23
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.3	31.9	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	24
striped maple	Acer pensylvanicum	NSL	Medium	5.7	19.0	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
serviceberry	Amelanchier spp.	NSL	Low	12.8	12.7	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	26
American basswood	Tilia americana	WSL	Medium	8.4	12.6	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
white ash	Fraxinus americana	WDL	Medium	3.5	12.3	3.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	28
Scots pine	Pinus sylvestris	NSH	FIA	1.8	11.5	6.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
American elm	Ulmus americana	WDH	Medium	9.7	11.4	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	30
green ash	Fraxinus pennsylvanica	WSH	Low	3.5	10.7	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	31
chokecherry	Prunus virginiana	NSLX	FIA	7.1	5.8	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
mountain maple	Acer spicatum	NSL	Low	5.1	2.1	0.4	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			1	33
American mountain-ash	Sorbus americana	NSL	Low	4.1	1.9	0.2	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	34
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	35
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	36
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	37
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	38
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	39
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	40
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	41
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	42
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	43
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	44
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	45
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	46
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	47

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USDA Forest Service  
Northern Research Station  
Landscape Change Research Group  
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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	49
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	50
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	51
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	52
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53