

**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    2,145.3    828.3      86

**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	20	14	Increase	9	7	Very Good	8	7	Likely	1	1
Hickory	0			Medium	22	30	No Change	5	5	Good	4	4	Infill	2	2
Maple	3	Abundant	10	Low	12	10	Decrease	19	21	Fair	7	8	Migrate	6	9
Oak	5	Common	14	FIA	1		New	18	19	Poor	7	7		9	12
Pine	4	Rare	10				Unknown	4	3	Very Poor	5	5			
Other	19	Absent	21					55	55	FIA Only	0	0			
	<b>34</b>		<b>55</b>		<b>55</b>	<b>54</b>				Unknown	3	2			
											<b>34</b>	<b>33</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	46.1	48.0	51.0	50.9	
	CCSM85	46.1	48.6	51.7	55.1	
	GFDL45	46.1	49.2	51.9	53.2	
	GFDL85	46.1	49.5	53.1	57.8	
	HAD45	46.1	49.5	52.7	54.6	
	HAD85	46.1	49.7	54.1	59.8	
Growing Season May—Sep	CCSM45	63.0	64.6	67.0	67.2	
	CCSM85	63.0	65.2	67.8	71.6	
	GFDL45	63.0	67.0	70.6	72.5	
	GFDL85	63.0	67.5	72.1	77.5	
	HAD45	63.0	66.7	68.9	71.4	
	HAD85	63.0	66.2	70.8	76.9	
Coldest Month Average	CCSM45	21.2	23.0	25.9	25.5	
	CCSM85	21.2	24.1	26.5	28.6	
	GFDL45	21.2	23.2	24.9	25.3	
	GFDL85	21.2	24.0	25.4	27.8	
	HAD45	21.2	22.9	26.6	26.8	
	HAD85	21.2	25.1	27.8	32.0	
Warmest Month Average	CCSM45	69.0	70.9	72.3	72.7	
	CCSM85	69.0	71.9	73.6	75.5	
	GFDL45	69.0	72.9	74.7	76.0	
	GFDL85	69.0	73.7	76.0	78.8	
	HAD45	69.0	73.2	74.2	76.1	
	HAD85	69.0	73.3	75.8	80.2	

**Precipitation (in)**

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	34.3	34.4	33.2	34.4	
	CCSM85	34.3	35.2	34.3	35.4	
	GFDL45	34.3	36.7	39.3	38.7	
	GFDL85	34.3	37.9	40.5	41.2	
	HAD45	34.3	35.4	37.0	36.9	
	HAD85	34.3	37.0	36.7	39.2	
Growing Season May—Sep	CCSM45	16.7	17.2	15.9	16.8	
	CCSM85	16.7	17.4	16.5	15.9	
	GFDL45	16.7	17.4	19.0	18.7	
	GFDL85	16.7	18.8	18.5	18.8	
	HAD45	16.7	16.4	15.5	16.1	
	HAD85	16.7	17.1	14.6	15.4	

**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
red maple	Acer rubrum	WDH	High	77.1	1690.5	9.7	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
eastern white pine	Pinus strobus	WDH	High	61.1	1435.7	9.2	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	2
red pine	Pinus resinosa	NSH	Medium	48	1323.2	11.7	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	3
sugar maple	Acer saccharum	WDH	High	45.1	1266.6	10.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
quaking aspen	Populus tremuloides	WDH	High	45.6	966.1	8.4	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	5
white oak	Quercus alba	WDH	Medium	42.8	854.7	10.4	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	6
northern red oak	Quercus rubra	WDH	Medium	49.7	721.8	5.9	No change	No change	High	Abundant	Very Good	Very Good			1	7
bigtooth aspen	Populus grandidentata	NSL	Medium	57	715.4	5.1	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	8
black cherry	Prunus serotina	WDL	Medium	63.1	708.1	5.4	Sm. inc.	No change	Low	Abundant	Good	Fair			1	9
black oak	Quercus velutina	WDH	High	44.5	580.9	6.0	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	10
American beech	Fagus grandifolia	WDH	High	51.7	483.1	3.6	No change	No change	Medium	Common	Fair	Fair			1	11
white ash	Fraxinus americana	WDL	Medium	30.1	482.4	3.8	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	12
green ash	Fraxinus pennsylvanica	WSH	Low	31.9	408.6	8.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
northern white-cedar	Thuja occidentalis	WSH	High	22.2	301.6	4.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
northern pin oak	Quercus ellipsoidalis	NSH	Medium	27.1	266.4	5.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	15
jack pine	Pinus banksiana	NSH	Medium	27.6	210.2	5.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
silver maple	Acer saccharinum	NSH	Low	22.1	198.5	6.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
paper birch	Betula papyrifera	WDH	High	32.4	183.2	1.4	No change	No change	Medium	Common	Fair	Fair			1	18
eastern hemlock	Tsuga canadensis	NSH	High	30.8	164.0	2.1	No change	Sm. dec.	Low	Common	Poor	Poor			0	19
American basswood	Tilia americana	WSL	Medium	23.4	100.1	1.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	25.1	95.6	1.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	21
tamarack (native)	Larix laricina	NSH	High	9.1	93.9	3.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	22
yellow birch	Betula alleghaniensis	NDL	High	26.3	84.7	1.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	23
American elm	Ulmus americana	WDH	Medium	31	78.7	1.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
Scots pine	Pinus sylvestris	NSH	FIA	4.3	34.5	1.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	25
black ash	Fraxinus nigra	WSH	Medium	14	31.6	1.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	26
black spruce	Picea mariana	NSH	High	2.3	26.2	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
white spruce	Picea glauca	NSL	Medium	2.6	11.6	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
serviceberry	Amelanchier spp.	NSL	Low	3.8	11.3	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
sassafras	Sassafras albidum	WSL	Low	4.1	10.9	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	30
slippery elm	Ulmus rubra	WSL	Low	4.7	6.3	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	31
balsam fir	Abies balsamea	NDH	High	1.7	4.2	0.3	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	32
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	1.5	2.0	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
bur oak	Quercus macrocarpa	NDH	Medium	4.7	1.5	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	35
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	36
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	37
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	38
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	39
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	41
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	42
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	43
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	44
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	45
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
blackgum	Nyssa sylvatica	WDL	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
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	49
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	51
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	52
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	53
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	54
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	55