

**One x One Degree**  
**Climate Change Atlas Tree Species**  
 Current and Potential Future Habitat, Capability, and Migration

Area of Region    sq. km    sq. mi    FIA Plots  
 8,376.7    3,234.3    452

**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	13	14	Increase	20	20	Very Good	8	8	Likely	0	0
Hickory	0			Medium	19	31	No Change	3	6	Good	10	11	Infill	3	3
Maple	5	Abundant	8	Low	18	8	Decrease	11	8	Fair	10	9	Migrate	5	10
Oak	4	Common	14	FIA	3		New	14	15	Poor	3	4		8	13
Pine	3	Rare	15				Unknown	5	4	Very Poor	1	0			
Other	23	Absent	16							FIA Only	3	3			
	<b>37</b>		<b>53</b>		<b>53</b>	<b>53</b>		<b>53</b>	<b>53</b>	Unknown	2	1			
											<b>37</b>	<b>36</b>			

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	39.6	41.1	44.0	44.5	
Average	CCSM85	39.6	41.9	45.3	49.0	
	GFDL45	39.6	42.5	45.1	46.8	
	GFDL85	39.6	42.8	46.4	51.6	
	HAD45	39.6	42.7	46.4	48.4	
	HAD85	39.6	43.2	47.5	53.5	
Growing Season	CCSM45	61.1	62.8	65.3	65.7	
	CCSM85	61.1	63.8	66.8	70.7	
May—Sep	GFDL45	61.1	64.3	67.6	69.7	
	GFDL85	61.1	64.8	68.8	74.5	
	HAD45	61.1	64.2	67.2	69.5	
	HAD85	61.1	64.1	68.2	74.4	
Coldest Month	CCSM45	4.6	6.4	8.6	8.9	
	CCSM85	4.6	5.7	8.5	10.9	
Average	GFDL45	4.6	8.2	10.1	10.8	
	GFDL85	4.6	9.1	10.8	14.2	
	HAD45	4.6	6.5	10.7	10.5	
	HAD85	4.6	10.1	13.4	17.6	
Warmest Month	CCSM45	67.9	69.8	71.4	71.9	
	CCSM85	67.9	71.2	73.3	75.8	
Average	GFDL45	67.9	71.6	73.0	74.7	
	GFDL85	67.9	72.0	74.2	77.3	
	HAD45	67.9	71.2	72.7	74.6	
	HAD85	67.9	71.3	73.6	77.6	

**Precipitation (in)**

Scenario	2009	2039	2069	2099		
Annual	CCSM45	26.1	26.7	26.8	26.0	
Total	CCSM85	26.1	26.0	26.4	26.0	
	GFDL45	26.1	29.1	30.7	28.9	
	GFDL85	26.1	29.9	31.8	31.3	
	HAD45	26.1	27.5	25.7	27.5	
	HAD85	26.1	27.6	27.0	28.6	
Growing Season	CCSM45	17.4	17.4	16.9	16.8	
	CCSM85	17.4	16.7	16.3	15.5	
May—Sep	GFDL45	17.4	19.7	20.2	19.1	
	GFDL85	17.4	20.1	20.8	19.7	
	HAD45	17.4	17.7	15.7	16.4	
	HAD85	17.4	17.4	15.5	15.2	

**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
quaking aspen	Populus tremuloides	WDH	High	94.2	2933.2	22.6	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
red pine	Pinus resinosa	NSH	Medium	46.8	840.9	13.9	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
black ash	Fraxinus nigra	WSH	Medium	73.4	753.1	8.0	No change	No change	Low	Abundant	Fair	Fair			0	3
paper birch	Betula papyrifera	WDH	High	90.2	687.1	5.5	No change	No change	Medium	Abundant	Good	Good			1	4
northern white-cedar	Thuja occidentalis	WSH	High	43.1	665.4	10.2	Sm. dec.	No change	Medium	Abundant	Fair	Good			1	5
tamarack (native)	Larix laricina	NSH	High	45.9	629.0	8.9	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	6
balsam fir	Abies balsamea	NDH	High	72.7	619.1	6.1	Sm. dec.	No change	Low	Abundant	Fair	Fair			0	7
bur oak	Quercus macrocarpa	NDH	Medium	73.9	512.5	4.7	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	8
American basswood	Tilia americana	WSL	Medium	57.5	484.3	6.8	Sm. inc.	No change	Medium	Common	Good	Fair			1	9
balsam poplar	Populus balsamifera	NSH	Medium	61.1	415.5	5.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
black spruce	Picea mariana	NSH	High	38.4	364.6	6.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
jack pine	Pinus banksiana	NSH	Medium	36.1	346.4	6.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
sugar maple	Acer saccharum	WDH	High	47	320.6	5.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
red maple	Acer rubrum	WDH	High	65.2	289.5	3.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
northern red oak	Quercus rubra	WDH	Medium	39.7	279.8	5.3	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
green ash	Fraxinus pennsylvanica	WSH	Low	66	230.0	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
eastern white pine	Pinus strobus	WDH	High	28.8	200.7	5.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	17
American elm	Ulmus americana	WDH	Medium	64.6	193.2	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
white spruce	Picea glauca	NSL	Medium	46.5	149.1	1.9	No change	Sm. inc.	Medium	Common	Fair	Good			1	19
bigtooth aspen	Populus grandidentata	NSL	Medium	29.8	147.2	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
boxelder	Acer negundo	WSH	Low	10.2	71.0	5.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
northern pin oak	Quercus ellipsoidalis	NSH	Medium	17.4	54.9	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	30.6	48.1	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	23
mountain maple	Acer spicatum	NSL	Low	30.8	33.6	0.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	24
pin cherry	Prunus pensylvanica	NSL	Low	15.6	20.9	1.1	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	25
chokecherry	Prunus virginiana	NSLX	FIA	28.5	17.6	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	26
yellow birch	Betula alleghaniensis	NDL	High	8.9	10.7	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	27
black cherry	Prunus serotina	WDL	Medium	13	10.5	0.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	28
serviceberry	Amelanchier spp.	NSL	Low	13	6.0	0.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	29
peachleaf willow	Salix amygdaloides	NSLX	FIA	2.8	3.7	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	30
eastern cottonwood	Populus deltoides	NSH	Low	1.2	3.2	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	31
silver maple	Acer saccharinum	NSH	Low	1.2	3.1	2.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	32
white oak	Quercus alba	WDH	Medium	2.4	2.3	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	33
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	2.4	1.2	0.5	Very Lg. dec.	No change	Medium	Rare	Lost	Poor			0	34
slippery elm	Ulmus rubra	WSL	Low	1.2	0.7	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	35
hackberry	Celtis occidentalis	WDH	Medium	0.4	0.3	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	36
wild plum	Prunus americana	NSLX	FIA	0.2	0.2	0.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	38
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	39
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	41
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	42
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	43
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	45
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	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
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	48
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	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
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	53