

**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  
 1,829.3    706.3    37

**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	
		Abundant	Common	High	Low	Scenario	Scenario	Scenario	Scenario	SHIFT	SHIFT
				Reliability	Adaptability	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85
Ash	3										
Hickory	0										
Maple	4	3		18	15	Increase	11	10	Very Good	4	3
Oak	1	19		20	30	No Change	6	7	Good	7	8
Pine	4	10		17	11	Decrease	13	13	Fair	8	7
Other	20	25		2		New	23	24	Poor	6	5
	<b>32</b>	<b>57</b>		<b>57</b>	<b>56</b>	Unknown	4	3	Very Poor	4	5
							<b>57</b>	<b>57</b>	FIA Only	1	1
									Unknown	2	1
										<b>13</b>	<b>12</b>

**Potential Changes in Climate Variables**

**Temperature (°F)**

Scenario	2009	2039	2069	2099	
Annual	44.2	45.9	49.1	48.9	
Average	44.2	46.7	49.8	53.3	
GFDL45	44.2	47.9	50.3	51.7	
GFDL85	44.2	47.7	51.5	56.6	
HAD45	44.2	47.7	50.8	52.8	
HAD85	44.2	48.0	52.1	58.1	
Growing Season	61.3	62.8	65.1	65.4	
May—Sep	61.3	63.4	66.2	69.9	
GFDL45	61.3	66.4	69.5	71.5	
GFDL85	61.3	66.2	71.0	76.7	
HAD45	61.3	64.8	66.9	69.4	
HAD85	61.3	64.4	68.5	74.5	
Coldest Month	18.4	20.2	23.2	22.4	
Average	18.4	21.2	23.5	26.0	
GFDL45	18.4	19.6	21.7	22.2	
GFDL85	18.4	20.6	22.4	25.1	
HAD45	18.4	20.2	24.1	24.4	
HAD85	18.4	22.6	25.1	30.1	
Warmest Month	67.6	69.5	71.0	71.3	
Average	67.6	70.2	72.0	74.0	
GFDL45	67.6	72.0	73.9	75.2	
GFDL85	67.6	72.7	75.2	78.0	
HAD45	67.6	71.3	72.2	74.1	
HAD85	67.6	71.5	73.7	77.9	

**Precipitation (in)**

Scenario	2009	2039	2069	2099	
Annual	31.2	31.7	31.3	32.0	
Total	31.2	32.4	31.2	32.7	
GFDL45	31.2	33.5	35.5	35.0	
GFDL85	31.2	33.7	36.3	36.9	
HAD45	31.2	32.6	34.1	33.6	
HAD85	31.2	33.7	34.2	36.5	
Growing Season	14.9	15.6	14.8	15.2	
May—Sep	14.9	15.4	14.2	14.1	
GFDL45	14.9	15.5	16.6	16.2	
GFDL85	14.9	16.2	16.0	15.8	
HAD45	14.9	14.9	14.0	14.2	
HAD85	14.9	15.3	13.2	14.0	

**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
sugar maple	Acer saccharum	WDH	High	60.6	3835.5	27.3	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
northern white-cedar	Thuja occidentalis	WSH	High	34.5	1563.4	16.4	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	2
white ash	Fraxinus americana	WDL	Medium	48.9	588.9	8.7	No change	No change	Low	Abundant	Fair	Fair			0	3
red pine	Pinus resinosa	NSH	Medium	18	466.5	6.2	Sm. inc.	No change	Low	Common	Fair	Poor			1	4
Scots pine	Pinus sylvestris	NSH	FIA	9.8	444.3	8.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	5
American beech	Fagus grandifolia	WDH	High	43.8	437.3	3.3	No change	No change	Medium	Common	Fair	Fair			1	6
black ash	Fraxinus nigra	WSH	Medium	36.5	355.9	6.3	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	7
quaking aspen	Populus tremuloides	WDH	High	11.5	337.5	6.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
balsam fir	Abies balsamea	NDH	High	22.8	295.5	4.2	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	9
red maple	Acer rubrum	WDH	High	20.9	292.8	3.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
eastern hemlock	Tsuga canadensis	NSH	High	22.6	285.2	6.5	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	11
balsam poplar	Populus balsamifera	NSH	Medium	13.9	257.2	3.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
paper birch	Betula papyrifera	WDH	High	19.4	243.8	4.5	No change	No change	Medium	Common	Fair	Fair			1	13
yellow birch	Betula alleghaniensis	NDL	High	21.2	200.8	3.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	14
American basswood	Tilia americana	WSL	Medium	26.8	183.5	4.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	15
black locust	Robinia pseudoacacia	NDH	Low	5.5	161.1	29.5	No change	No change	Medium	Common	Fair	Fair			1	16
bigtooth aspen	Populus grandidentata	NSL	Medium	19.6	148.6	3.9	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	17
eastern white pine	Pinus strobus	WDH	High	12.2	135.4	3.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	18
green ash	Fraxinus pennsylvanica	WSH	Low	22.6	88.3	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	28.7	85.1	2.4	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	20
black cherry	Prunus serotina	WDL	Medium	15.4	81.3	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	21
jack pine	Pinus banksiana	NSH	Medium	5.5	63.8	11.7	No change	No change	High	Common	Good	Good			1	22
American elm	Ulmus americana	WDH	Medium	27	49.7	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	23
striped maple	Acer pensylvanicum	NSL	Medium	1.4	39.9	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
white spruce	Picea glauca	NSL	Medium	17.7	31.2	0.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	25
northern red oak	Quercus rubra	WDH	Medium	3.9	30.8	4.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	26
peachleaf willow	Salix amygdaloides	NSLX	FIA	3.1	25.6	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
black spruce	Picea mariana	NSH	High	4.4	20.6	0.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	28
pin cherry	Prunus pensylvanica	NSL	Low	9.8	15.9	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	29
serviceberry	Amelanchier spp.	NSL	Low	3.3	14.5	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	5.5	9.8	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
mountain maple	Acer spicatum	NSL	Low	5.5	4.4	0.8	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			1	32
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	33
tamarack (native)	Larix laricina	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	34
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	35
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	36
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	37
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	38
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	39
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	41
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	42
black walnut	Juglans nigra	WDL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	43
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	44
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	45
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	46
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	47

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USDA Forest Service  
Northern Research Station  
Landscape Change Research Group  
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	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
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++		3	50
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	51
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	52
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	53
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	56
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	57