

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
 8,985.5 3,469.3 322

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	22	19	Increase	19	18	Very Good	5	6
Hickory	3			Medium	23	39	No Change	5	5	Good	9	10
Maple	4	Abundant	7	Low	27	16	Decrease	14	15	Fair	12	9
Oak	3	Common	13	FIA	4		New	26	30	Poor	4	4
Pine	3	Rare	22				Unknown	12	8	Very Poor	7	8
Other	27	Absent	34							FIA Only	2	2
	42		76		76	74		76	76	Unknown	8	4
											47	43

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	41.8	43.7	46.2	46.2	
Average	CCSM85	41.8	44.2	46.9	50.2	
	GFDL45	41.8	44.9	48.4	49.8	
	GFDL85	41.8	45.5	49.8	54.8	
	HAD45	41.8	44.9	48.2	50.0	
	HAD85	41.8	45.0	49.2	54.9	
Growing Season	CCSM45	59.5	61.6	63.5	64.0	
	CCSM85	59.5	61.9	64.4	68.3	
May—Sep	GFDL45	59.5	62.8	67.0	68.6	
	GFDL85	59.5	63.8	68.5	73.9	
	HAD45	59.5	62.7	65.4	67.9	
	HAD85	59.5	62.4	66.9	73.2	
Coldest Month	CCSM45	13.8	15.6	18.0	18.1	
	CCSM85	13.8	16.9	18.2	20.6	
Average	GFDL45	13.8	17.1	19.4	20.4	
	GFDL85	13.8	18.1	20.1	23.0	
	HAD45	13.8	16.2	19.4	19.7	
	HAD85	13.8	17.4	20.1	23.8	
Warmest Month	CCSM45	65.3	67.6	68.8	69.0	
	CCSM85	65.3	68.2	69.9	72.1	
Average	GFDL45	65.3	68.4	70.7	72.0	
	GFDL85	65.3	69.8	72.6	75.5	
	HAD45	65.3	68.7	70.2	71.9	
	HAD85	65.3	68.7	71.4	76.0	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	49.9	49.0	47.5	52.3	
Total	CCSM85	49.9	50.4	51.2	52.5	
	GFDL45	49.9	54.6	56.4	55.1	
	GFDL85	49.9	52.0	55.4	57.5	
	HAD45	49.9	52.2	54.2	53.4	
	HAD85	49.9	53.4	52.8	57.3	
Growing Season	CCSM45	22.2	21.8	20.3	22.2	
Season	CCSM85	22.2	22.0	22.3	20.7	
May—Sep	GFDL45	22.2	23.1	22.0	21.9	
	GFDL85	22.2	22.2	21.8	20.8	
	HAD45	22.2	23.0	21.9	22.6	
	HAD85	22.2	22.4	21.5	23.0	

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
American beech	Fagus grandifolia	WDH	High	94.6	2395.9	18.6	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
sugar maple	Acer saccharum	WDH	High	88.9	1695.9	13.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	95.7	1522.3	11.7	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	3
yellow birch	Betula alleghaniensis	NDL	High	97.1	1323.7	10.1	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
red spruce	Picea rubens	NDH	High	81.9	1161.4	10.9	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	5
eastern hemlock	Tsuga canadensis	NSH	High	63.2	727.2	8.3	Sm. inc.	No change	Low	Abundant	Good	Fair			1	6
balsam fir	Abies balsamea	NDH	High	67.8	572.9	6.2	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	7
eastern white pine	Pinus strobus	WDH	High	34.5	317.9	7.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	8
white ash	Fraxinus americana	WDL	Medium	52	266.1	3.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
black cherry	Prunus serotina	WDL	Medium	54.2	233.0	2.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	10
striped maple	Acer pensylvanicum	NSL	Medium	66.7	172.4	2.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
quaking aspen	Populus tremuloides	WDH	High	22.6	136.1	5.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
tamarack (native)	Larix laricina	NSH	High	11.8	127.3	6.3	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	13
northern red oak	Quercus rubra	WDH	Medium	15.2	102.4	3.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
paper birch	Betula papyrifera	WDH	High	22.8	99.2	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
American elm	Ulmus americana	WDH	Medium	15.3	91.1	3.4	No change	No change	Medium	Common	Fair	Fair			1	16
American basswood	Tilia americana	WSL	Medium	19.2	65.8	1.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
boxelder	Acer negundo	WSH	Low	2.1	59.4	26.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	18
Scots pine	Pinus sylvestris	NSH	FIA	3.5	56.6	10.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	24.3	54.2	1.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
Norway spruce	Picea abies	NSH	FIA	3.1	44.3	12.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	21
northern white-cedar	Thuja occidentalis	WSH	High	4.1	37.7	4.7	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	22
bigtooth aspen	Populus grandidentata	NSL	Medium	13.8	31.7	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	23
serviceberry	Amelanchier spp.	NSL	Low	15.5	29.6	1.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	24
black ash	Fraxinus nigra	WSH	Medium	5.6	27.5	3.6	No change	No change	Low	Rare	Very Poor	Very Poor			0	25
red pine	Pinus resinosa	NSH	Medium	2.9	24.2	6.3	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	26
gray birch	Betula populifolia	NSL	Low	4.5	15.9	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
shagbark hickory	Carya ovata	WSL	Medium	0.8	15.6	9.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	28
bitternut hickory	Carya cordiformis	WSL	Low	3.5	15.2	1.1	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	29
pignut hickory	Carya glabra	WDL	Medium	1.6	13.5	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	30
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	4.5	12.3	1.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	31
sweet birch	Betula lenta	NDH	High	1.5	9.6	0.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	32
pin cherry	Prunus pensylvanica	NSL	Low	8.6	8.3	0.9	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			1	33
black spruce	Picea mariana	NSH	High	1.5	7.2	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	34
white spruce	Picea glauca	NSL	Medium	1	3.0	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	35
American mountain-ash	Sorbus americana	NSL	Low	3.1	2.6	0.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
black willow	Salix nigra	NSH	Low	1.2	2.3	0.5	Lg. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	37
chokecherry	Prunus virginiana	NSLX	FIA	2.7	1.8	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	38
white oak	Quercus alba	WDH	Medium	1.1	1.5	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	39
butternut	Juglans cinerea	NSLX	FIA	0.2	1.0	0.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	40
swamp white oak	Quercus bicolor	NSL	Low	0.8	0.7	0.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	41
black locust	Robinia pseudoacacia	NDH	Low	1.1	0.7	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	43
pitch pine	Pinus rigida	NSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	44
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	45
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	46
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	47

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Climate Change Atlas Tree Species

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

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
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	48
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	50
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	51
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	52
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	54
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	55
green ash	<i>Fraxinus pennsylvanica</i>	WSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	56
black walnut	<i>Juglans nigra</i>	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	57
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	59
southern magnolia	<i>Magnolia grandiflora</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	60
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	61
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			0	62
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	63
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	64
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	65
eastern cottonwood	<i>Populus deltoides</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	67
southern red oak	<i>Quercus falcata</i>	WDL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	68
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	70
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	71
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	72
black oak	<i>Quercus velutina</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	73
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	74
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	75
slippery elm	<i>Ulmus rubra</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76