

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
 3,845.7 1,484.8 40

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	13	18	Increase	13	15	Very Good	1	1
Hickory	3			Medium	19	26	No Change	8	5	Good	9	10
Maple	5	Abundant	2	Low	19	9	Decrease	12	13	Fair	9	10
Oak	5	Common	11	FIA	4		New	17	17	Poor	7	3
Pine	2	Rare	24				Unknown	5	5	Very Poor	5	7
Other	19	Absent	17							FIA Only	2	2
	37		54		55	53		55	55	Unknown	1	1
											34	34

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	46.6	48.4	51.4	51.3	
Average	CCSM85	46.6	49.1	52.0	55.4	
	GFDL45	46.6	51.7	52.5	53.6	
	GFDL85	46.6	49.9	53.6	58.2	
	HAD45	46.6	49.9	53.2	55.1	
	HAD85	46.6	50.0	54.3	59.9	
Growing Season	CCSM45	64.0	65.6	68.0	68.2	
	CCSM85	64.0	66.2	68.8	72.7	
May—Sep	GFDL45	64.0	70.3	71.2	72.8	
	GFDL85	64.0	68.2	72.6	77.8	
	HAD45	64.0	67.4	69.8	72.3	
	HAD85	64.0	66.9	71.4	77.2	
Coldest Month	CCSM45	20.1	21.7	24.5	24.4	
	CCSM85	20.1	22.8	24.9	27.2	
Average	GFDL45	20.1	22.6	24.2	24.8	
	GFDL85	20.1	23.2	24.8	27.1	
	HAD45	20.1	21.8	25.6	25.7	
	HAD85	20.1	23.9	26.8	30.7	
Warmest Month	CCSM45	70.1	72.3	73.7	73.9	
	CCSM85	70.1	73.2	74.8	76.9	
Average	GFDL45	70.1	73.3	75.2	76.2	
	GFDL85	70.1	74.2	76.5	79.4	
	HAD45	70.1	73.9	75.4	77.2	
	HAD85	70.1	74.2	76.9	81.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	32.4	32.5	31.5	33.2	
Total	CCSM85	32.4	33.2	32.6	32.7	
	GFDL45	32.4	34.6	38.2	37.4	
	GFDL85	32.4	34.5	37.9	39.1	
	HAD45	32.4	33.5	35.1	34.6	
	HAD85	32.4	35.2	33.1	36.8	
Growing Season	CCSM45	16.5	16.8	15.7	16.1	
	CCSM85	16.5	16.7	16.0	15.2	
May—Sep	GFDL45	16.5	16.9	18.4	18.1	
	GFDL85	16.5	17.2	17.3	17.4	
	HAD45	16.5	16.3	15.0	15.7	
	HAD85	16.5	16.8	13.5	14.7	

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
green ash	Fraxinus pennsylvanica	WSH	Low	77.8	1141.0	19.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
quaking aspen	Populus tremuloides	WDH	High	39.9	825.2	20.7	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	2
American elm	Ulmus americana	WDH	Medium	74.9	497.8	10.6	No change	No change	Medium	Common	Fair	Fair			1	3
red maple	Acer rubrum	WDH	High	51.8	373.8	8.5	No change	No change	High	Common	Good	Good			1	4
eastern cottonwood	Populus deltoides	NSH	Low	26.1	328.1	11.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	5
white ash	Fraxinus americana	WDL	Medium	37.4	193.6	7.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	6
eastern white pine	Pinus strobus	WDH	High	23.4	189.6	16.9	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor	Infill +		0	7
American basswood	Tilia americana	WSL	Medium	20.3	173.7	7.8	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	8
black cherry	Prunus serotina	WDL	Medium	51.7	169.8	7.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
paper birch	Betula papyrifera	WDH	High	21.8	159.1	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	10
sugar maple	Acer saccharum	WDH	High	19.3	89.9	7.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
bur oak	Quercus macrocarpa	NDH	Medium	8.7	83.2	10.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	12
peachleaf willow	Salix amygdaloides	NSLX	FIA	13	53.4	12.1	Unknown	Unknown	Medium	Common	FIA Only	FIA Only			0	13
boxelder	Acer negundo	WSH	Low	30.1	49.7	4.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	14
Scots pine	Pinus sylvestris	NSH	FIA	19.1	39.4	5.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	15
black walnut	Juglans nigra	WDH	Low	6.3	39.4	11.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	16
silver maple	Acer saccharinum	NSH	Low	14.2	38.6	4.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	17
northern red oak	Quercus rubra	WDH	Medium	13.7	26.5	3.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	18
black willow	Salix nigra	NSH	Low	11.5	25.8	2.6	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	2	19
mockernut hickory	Carya alba	WDL	Medium	2.6	22.4	8.6	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	20
white oak	Quercus alba	WDH	Medium	1.5	19.5	4.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	21
black oak	Quercus velutina	WDH	High	1.1	19.4	3.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	22
American beech	Fagus grandifolia	WDH	High	11.5	17.0	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	23
swamp white oak	Quercus bicolor	NSL	Low	5.2	15.7	1.6	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	24
northern white-cedar	Thuja occidentalis	WSH	High	8.2	10.7	1.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	25
serviceberry	Amelanchier spp.	NSL	Low	6.8	7.3	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	26
bigtooth aspen	Populus grandidentata	NSL	Medium	4.7	6.6	1.0	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	27
balsam poplar	Populus balsamifera	NSH	Medium	4.7	4.7	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
black ash	Fraxinus nigra	WSH	Medium	9.9	4.4	1.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	29
blackgum	Nyssa sylvatica	WDL	Medium	1.1	4.3	0.7	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	30
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	12.2	2.9	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
chokecherry	Prunus virginiana	NSLX	FIA	5.7	2.9	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
American mountain-ash	Sorbus americana	NSL	Low	4.7	2.7	1.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	33
shagbark hickory	Carya ovata	WSL	Medium	1.5	2.1	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	34
Norway maple	Acer platanoides	NSL	FIA	8.1	1.9	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	35
bitternut hickory	Carya cordiformis	WSL	Low	4.2	1.1	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	36
eastern hemlock	Tsuga canadensis	NSH	High	2.7	0.4	0.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	38
tamarack (native)	Larix laricina	NSH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	39
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	40
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	41
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	42
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	43
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	44
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	45
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	47

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Climate Change Atlas Tree Species

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
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	50
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	52
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	53
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	54
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	55