

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 8,875.8 3,427.0 198

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	21	20	Increase	17	16	Very Good	3	2
Hickory	3			Medium	26	43	No Change	9	9	Good	15	14
Maple	6	Abundant	4	Low	26	13	Decrease	20	21	Fair	7	9
Oak	6	Common	21	FIA	6		New	22	23	Poor	10	10
Pine	4	Rare	27				Unknown	11	10	Very Poor	8	5
Other	30	Absent	25							FIA Only	3	3
	52		77		79	76		79	79	Unknown	5	4
											51	47

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	45.5	47.5	50.1	50.2	
Average	CCSM85	45.5	47.9	50.6	53.9	
	GFDL45	45.5	48.8	51.7	52.9	
	GFDL85	45.5	49.0	52.9	57.5	
	HAD45	45.5	48.8	52.1	53.9	
	HAD85	45.5	48.8	53.2	58.6	
Growing Season	CCSM45	62.1	64.0	66.3	66.6	
	CCSM85	62.1	64.3	67.0	70.9	
May—Sep	GFDL45	62.1	65.8	69.6	71.2	
	GFDL85	62.1	66.7	71.0	76.1	
	HAD45	62.1	65.7	68.4	70.9	
	HAD85	62.1	65.2	70.2	76.2	
Coldest Month	CCSM45	19.9	22.1	24.4	24.4	
	CCSM85	19.9	23.0	24.4	26.5	
Average	GFDL45	19.9	22.6	24.2	24.9	
	GFDL85	19.9	23.4	24.9	27.2	
	HAD45	19.9	21.7	25.0	25.0	
	HAD85	19.9	23.0	25.5	28.9	
Warmest Month	CCSM45	67.9	70.2	71.6	71.9	
	CCSM85	67.9	70.7	72.4	74.6	
Average	GFDL45	67.9	70.8	73.3	74.4	
	GFDL85	67.9	72.4	75.0	77.9	
	HAD45	67.9	72.0	73.6	75.4	
	HAD85	67.9	72.1	75.4	79.9	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	42.2	42.6	41.4	44.0	
Total	CCSM85	42.2	43.6	43.7	44.2	
	GFDL45	42.2	46.2	47.7	47.0	
	GFDL85	42.2	43.5	47.0	48.1	
	HAD45	42.2	42.4	43.6	43.4	
	HAD85	42.2	43.7	41.9	45.5	
Growing Season	CCSM45	20.0	20.1	18.9	20.2	
	CCSM85	20.0	19.6	19.5	18.9	
May—Sep	GFDL45	20.0	21.0	20.5	19.9	
	GFDL85	20.0	19.7	19.8	19.2	
	HAD45	20.0	19.6	18.2	19.0	
	HAD85	20.0	19.7	17.0	17.8	

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	71.8	1526.5	16.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	69.4	1374.8	15.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
white ash	Fraxinus americana	WDL	Medium	70.2	958.3	11.3	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	3
black cherry	Prunus serotina	WDL	Medium	67.9	607.7	8.1	Sm. inc.	No change	Low	Abundant	Good	Fair			1	4
quaking aspen	Populus tremuloides	WDH	High	42.2	449.9	8.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	5
American beech	Fagus grandifolia	WDH	High	53.3	436.3	6.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
eastern hemlock	Tsuga canadensis	NSH	High	34	382.1	8.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	7
green ash	Fraxinus pennsylvanica	WSH	Low	21.5	343.2	16.1	Sm. dec.	No change	Medium	Common	Poor	Fair			1	8
northern red oak	Quercus rubra	WDH	Medium	25	229.0	4.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
American elm	Ulmus americana	WDH	Medium	46.9	201.3	4.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
eastern white pine	Pinus strobus	WDH	High	22	182.0	6.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
bitternut hickory	Carya cordiformis	WSL	Low	24.6	179.8	4.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
American basswood	Tilia americana	WSL	Medium	28.6	179.4	4.5	No change	No change	Medium	Common	Fair	Fair			1	13
Scots pine	Pinus sylvestris	NSH	FIA	14.5	178.5	15.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	14
black willow	Salix nigra	NSH	Low	7.2	149.1	16.4	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	15
yellow birch	Betula alleghaniensis	NDL	High	28	128.3	2.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	38.4	111.0	2.2	No change	No change	High	Common	Good	Good			1	17
Norway spruce	Picea abies	NSH	FIA	19.2	105.7	6.9	Unknown	Unknown	NA	Common	NNIS	NNIS			0	18
bigtooth aspen	Populus grandidentata	NSL	Medium	10.5	104.3	8.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
white spruce	Picea glauca	NSL	Medium	2.5	98.2	26.1	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	20
silver maple	Acer saccharinum	NSH	Low	6.2	88.7	8.4	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	21
white oak	Quercus alba	WDH	Medium	13.2	84.7	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
red pine	Pinus resinosa	NSH	Medium	10.1	84.6	8.3	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	23
black locust	Robinia pseudoacacia	NDH	Low	2.4	70.4	18.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
sweet birch	Betula lenta	NDH	High	14.7	63.6	1.9	Lg. inc.	Sm. inc.	Low	Common	Good	Fair	Infill ++	Infill +	1	25
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	28.1	48.9	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	26
eastern cottonwood	Populus deltoides	NSH	Low	9.5	48.8	8.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	27
pin cherry	Prunus pensylvanica	NSL	Low	5.7	47.6	7.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	28
serviceberry	Amelanchier spp.	NSL	Low	22.7	44.4	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
shagbark hickory	Carya ovata	WSL	Medium	9.3	32.3	2.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	30
striped maple	Acer pensylvanicum	NSL	Medium	9.6	30.9	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
boxelder	Acer negundo	WSH	Low	3.6	26.0	5.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	32
black oak	Quercus velutina	WDH	High	2.6	24.5	3.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	33
black walnut	Juglans nigra	WDH	Low	2.5	22.8	6.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	34
chokecherry	Prunus virginiana	NSL	FIA	5.5	20.5	3.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
pignut hickory	Carya glabra	WDL	Medium	4	16.0	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
yellow-poplar	Liriodendron tulipifera	WDH	High	3.7	15.7	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	37
cucumbertree	Magnolia acuminata	NSL	Low	7.4	14.7	0.7	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		1	38
black ash	Fraxinus nigra	WSH	Medium	6	9.6	1.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	39
chestnut oak	Quercus prinus	NDH	High	2.5	7.2	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	40
jack pine	Pinus banksiana	NSH	Medium	1.1	7.0	6.2	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	41
butternut	Juglans cinerea	NSLX	FIA	2.3	5.1	2.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	42
eastern redcedar	Juniperus virginiana	WDH	Medium	0.3	3.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
gray birch	Betula populifolia	NSL	Low	1.1	2.7	2.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	44
swamp white oak	Quercus bicolor	NSL	Low	2.8	2.5	1.2	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	45
American chestnut	Castanea dentata	NSLX	FIA	2.5	2.4	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	46
pin oak	Quercus palustris	NSH	Low	1.7	1.7	2.2	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	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
sassafras	Sassafras albidum	WSL	Low	3.4	1.5	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
Norway maple	Acer platanoides	NSL	FIA	1.1	1.2	1.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
slippery elm	Ulmus rubra	WSL	Low	1.3	1.2	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	50
northern white-cedar	Thuja occidentalis	WSH	High	1.1	1.1	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
American mountain-ash	Sorbus americana	NSL	Low	1.1	0.3	0.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	52
balsam fir	Abies balsamea	NDH	High	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	53
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	54
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	55
paper birch	Betula papyrifera	WDH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	56
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	57
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	58
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	59
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	60
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	61
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	62
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	63
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	65
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	66
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	67
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	68
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	69
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	71
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	74
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	76
water oak	Quercus nigra	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	77
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	78
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79