

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
 9,130.7 3,525.4 232

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	23	19	Increase	14	16	Very Good	4	3	Likely	5	5
Hickory	3			Medium	22	40	No Change	11	7	Good	12	13	Infill	12	11
Maple	6	Abundant	6	Low	26	14	Decrease	19	21	Fair	9	9	Migrate	3	14
Oak	5	Common	20	FIA	4		New	21	23	Poor	11	10			
Pine	3	Rare	22				Unknown	10	8	Very Poor	3	0			
Other	28	Absent	26							FIA Only	2	2			
	48		74		75	73		75	75	Unknown	6	4			
											47	41			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	45.3	47.2	49.6	49.8	
	CCSM85	45.3	47.7	50.3	53.5	
	GFDL45	45.3	48.2	51.6	52.8	
	GFDL85	45.3	48.8	52.9	57.5	
	HAD45	45.3	48.4	51.7	53.5	
Growing Season (May—Sep)	CCSM45	62.2	64.3	66.2	66.7	
	CCSM85	62.2	64.5	67.0	71.0	
	GFDL45	62.2	65.3	69.5	71.0	
	GFDL85	62.2	66.5	71.0	76.0	
	HAD45	62.2	65.5	68.3	70.7	
Coldest Month (Average)	CCSM45	18.9	20.9	23.0	23.2	
	CCSM85	18.9	21.8	23.1	25.2	
	GFDL45	18.9	22.1	23.9	24.7	
	GFDL85	18.9	22.6	24.4	26.8	
	HAD45	18.9	20.9	24.0	24.1	
Warmest Month (Average)	CCSM45	68.0	70.4	71.6	71.8	
	CCSM85	68.0	70.8	72.5	74.7	
	GFDL45	68.0	70.9	73.3	74.4	
	GFDL85	68.0	72.3	75.0	77.9	
	HAD45	68.0	71.6	73.2	74.9	
HAD85	68.0	71.6	74.5	79.0		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.3	43.3	42.4	46.2	
	CCSM85	43.3	44.1	45.1	46.5	
	GFDL45	43.3	47.5	49.1	48.2	
	GFDL85	43.3	45.1	48.3	50.3	
	HAD45	43.3	45.1	46.5	45.3	
Growing Season (May—Sep)	CCSM45	20.3	20.5	19.6	21.3	
	CCSM85	20.3	20.5	20.9	20.0	
	GFDL45	20.3	21.1	20.5	20.6	
	GFDL85	20.3	20.2	20.1	19.9	
	HAD45	20.3	21.3	19.8	20.1	
HAD85	20.3	20.3	19.6	21.0		

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
red maple	Acer rubrum	WDH	High	79.1	2033.9	18.9	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
white ash	Fraxinus americana	WDL	Medium	82.6	1495.4	12.0	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	2
sugar maple	Acer saccharum	WDL	High	77.9	1402.0	11.9	No change	No change	High	Abundant	Very Good	Very Good			1	3
eastern hemlock	Tsuga canadensis	NSH	High	56.5	865.9	11.3	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
black cherry	Prunus serotina	WDL	Medium	72.8	821.6	7.5	No change	No change	Low	Abundant	Fair	Fair			0	5
American beech	Fagus grandifolia	WDH	High	67.8	796.4	8.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
eastern white pine	Pinus strobus	WDH	High	37.9	453.7	9.9	No change	No change	Low	Common	Poor	Poor			0	7
quaking aspen	Populus tremuloides	WDH	High	38.4	453.6	7.9	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	8
Norway spruce	Picea abies	NSH	FIA	19.8	344.4	12.7	Unknown	Unknown	NA	Common	NNIS	NNIS			0	9
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	48.6	253.2	2.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	10
northern red oak	Quercus rubra	WDH	Medium	34.1	204.9	5.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
American elm	Ulmus americana	WDH	Medium	28.1	197.2	4.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
yellow birch	Betula alleghaniensis	NDL	High	38.1	179.0	3.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	13
sweet birch	Betula lenta	NDH	High	31.8	144.5	3.1	Lg. inc.	Sm. inc.	Low	Common	Good	Fair			1	14
American basswood	Tilia americana	WSL	Medium	23.6	106.9	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
red pine	Pinus resinosa	NSH	Medium	9.6	97.4	8.6	Very Lg. dec.	Very Lg. dec.	Low	Common	Lost	Lost			0	16
Scots pine	Pinus sylvestris	NSH	FIA	7	92.1	5.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	17
silver maple	Acer saccharinum	NSH	Low	0.8	88.4	7.8	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	2	18
white spruce	Picea glauca	NSL	Medium	7.7	86.4	11.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
serviceberry	Amelanchier spp.	NSL	Low	30.6	83.6	1.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
boxelder	Acer negundo	WSH	Low	2	64.4	3.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	21
black willow	Salix nigra	NSH	Low	2.6	60.1	13.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	22
green ash	Fraxinus pennsylvanica	WSH	Low	5.4	54.6	7.5	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	23
striped maple	Acer pensylvanicum	NSL	Medium	17.1	52.2	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
northern white-cedar	Thuja occidentalis	WSH	High	2.9	51.2	14.2	Very Lg. dec.	Very Lg. dec.	Medium	Common	Lost	Lost			0	25
bitternut hickory	Carya cordiformis	WSL	Low	7.4	50.6	5.3	No change	No change	High	Common	Good	Good			1	26
eastern cottonwood	Populus deltoides	NSH	Low	0.6	48.2	22.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	27
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	22.2	45.3	1.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	28
black oak	Quercus velutina	WDL	High	6.3	31.4	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	29
shagbark hickory	Carya ovata	WSL	Medium	6.6	26.0	4.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	30
balsam fir	Abies balsamea	NDH	High	4.4	25.1	5.7	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	31
white oak	Quercus alba	WDH	Medium	2.2	20.6	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	32
black locust	Robinia pseudoacacia	NDH	Low	4.5	18.6	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
bigtooth aspen	Populus grandidentata	NSL	Medium	9.8	17.4	1.0	Lg. inc.	Sm. inc.	Medium	Rare	Good	Fair			1	34
pin cherry	Prunus pensylvanica	NSL	Low	5.5	16.4	3.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	35
slippery elm	Ulmus rubra	WSL	Low	2.1	11.8	5.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	36
black walnut	Juglans nigra	WDH	Low	0.2	11.0	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
chestnut oak	Quercus prinus	NDH	High	3.1	9.7	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	38
tamarack (native)	Larix laricina	NSH	High	1.4	7.6	2.3	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	39
pignut hickory	Carya glabra	WDL	Medium	3.1	7.3	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	40
butternut	Juglans cinerea	NSLX	FIA	1.4	6.1	2.4	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	41
scarlet oak	Quercus coccinea	WDL	Medium	1.1	5.4	4.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
red spruce	Picea rubens	NDH	High	1.1	3.2	2.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	43
mountain maple	Acer spicatum	NSL	Low	0.5	2.4	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	44
chokecherry	Prunus virginiana	NSLX	FIA	1.1	1.9	1.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
paper birch	Betula papyrifera	WDH	High	2.1	1.7	0.7	No change	Very Lg. dec.	Medium	Rare	Poor	Lost	Infill +		2	46
gray birch	Betula populifolia	NSL	Low	0.6	1.0	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	47

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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
black ash	Fraxinus nigra	WSH	Medium	1.1	0.7	0.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0 48
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 49
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 50
pitch pine	Pinus rigida	NSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 51
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 52
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 53
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 54
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 55
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 56
sugaberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0 57
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 58
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 59
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 60
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 61
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 62
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 63
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 64
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 65
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 66
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 67
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 68
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 69
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 70
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +		3 71
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 72
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 73
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 74
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 75