

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	8,818.1	3,404.7	252

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	15	18	Increase	11	12	Very Good	6	7	Likely	3	3
Hickory	2			Medium	23	35	No Change	14	11	Good	10	9	Infill	14	16
Maple	4	Abundant	5	Low	24	13	Decrease	17	19	Fair	10	8	Migrate	3	10
Oak	6	Common	26	FIA	7		New	17	17	Poor	5	9		20	29
Pine	4	Rare	18				Unknown	10	10	Very Poor	10	8			
Other	30	Absent	20					69	69	FIA Only	4	4			
	49		69		69	66				Unknown	3	3			
											48	48			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.6	46.5	49.6	49.5	
	CCSM85	44.6	47.3	50.2	53.6	
	GFDL45	44.6	48.7	50.4	51.7	
	GFDL85	44.6	48.0	51.6	56.5	
	HAD45	44.6	47.8	51.2	53.0	
	HAD85	44.6	48.1	52.4	58.0	
Growing Season (May—Sep)	CCSM45	63.9	65.8	68.3	68.4	
	CCSM85	63.9	66.6	69.1	73.1	
	GFDL45	63.9	69.0	70.9	73.0	
	GFDL85	63.9	68.0	72.3	78.0	
	HAD45	63.9	67.0	69.2	71.4	
	HAD85	63.9	66.8	70.8	76.1	
Coldest Month (Average)	CCSM45	14.4	15.9	18.9	18.8	
	CCSM85	14.4	16.8	19.1	21.5	
	GFDL45	14.4	17.3	19.2	19.5	
	GFDL85	14.4	18.4	19.9	22.5	
	HAD45	14.4	15.8	19.9	20.1	
	HAD85	14.4	18.7	22.2	26.2	
Warmest Month (Average)	CCSM45	70.1	72.4	73.8	74.3	
	CCSM85	70.1	73.5	75.2	77.4	
	GFDL45	70.1	73.7	75.4	76.9	
	GFDL85	70.1	74.7	77.0	80.2	
	HAD45	70.1	73.2	74.3	75.8	
	HAD85	70.1	73.8	75.9	79.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	30.7	30.8	30.4	31.2	
	CCSM85	30.7	31.2	31.3	32.0	
	GFDL45	30.7	33.0	35.4	34.5	
	GFDL85	30.7	33.8	36.6	36.4	
	HAD45	30.7	31.1	32.7	33.1	
	HAD85	30.7	32.3	33.0	34.7	
Growing Season (May—Sep)	CCSM45	17.8	17.6	17.0	18.0	
	CCSM85	17.8	18.0	17.8	17.2	
	GFDL45	17.8	18.4	19.6	18.8	
	GFDL85	17.8	19.3	19.4	18.6	
	HAD45	17.8	17.1	16.5	17.0	
	HAD85	17.8	17.7	15.7	16.0	

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
green ash	Fraxinus pennsylvanica	WSH	Low	75.8	984.6	14.7	No change	No change	Medium	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	64.2	682.2	8.7	No change	No change	High	Abundant	Very Good	Very Good			1	2
northern white-cedar	Thuja occidentalis	WSH	High	43.3	605.2	10.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
eastern white pine	Pinus strobus	WDH	High	38.7	512.4	8.9	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
quaking aspen	Populus tremuloides	WDH	High	48.9	512.0	8.0	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	5
black ash	Fraxinus nigra	WSH	Medium	57.8	472.5	6.5	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	6
sugar maple	Acer saccharum	WDH	High	36.3	378.8	6.4	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	7
American elm	Ulmus americana	WDH	Medium	80.2	372.6	4.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
red pine	Pinus resinosa	NSH	Medium	25.6	323.1	8.8	No change	Sm. dec.	Low	Common	Poor	Poor			0	9
American basswood	Tilia americana	WSL	Medium	53	305.5	5.4	No change	Sm. dec.	Medium	Common	Fair	Poor			1	10
tamarack (native)	Larix laricina	NSH	High	21.3	305.0	9.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	11
northern red oak	Quercus rubra	WDH	Medium	38.8	263.8	5.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
white ash	Fraxinus americana	WDL	Medium	51.5	247.9	4.1	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
silver maple	Acer saccharinum	NSH	Low	23.9	246.2	11.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	14
paper birch	Betula papyrifera	WDH	High	44.9	211.3	3.4	No change	No change	Medium	Common	Fair	Fair			1	15
boxelder	Acer negundo	WSH	Low	33.6	194.3	6.7	No change	No change	High	Common	Good	Good			1	16
white spruce	Picea glauca	NSL	Medium	8.9	170.5	7.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
eastern hemlock	Tsuga canadensis	NSH	High	25.7	161.7	4.3	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	18
black cherry	Prunus serotina	WDL	Medium	47.6	160.1	2.6	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
northern pin oak	Quercus ellipsoidalis	NSH	Medium	18.6	144.2	5.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	20
black willow	Salix nigra	NSH	Low	20.9	129.9	14.8	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor		Infill +	0	21
eastern cottonwood	Populus deltoides	NSH	Low	12.2	116.0	13.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	22
balsam fir	Abies balsamea	NDH	High	18.9	99.7	2.4	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	23
bigtooth aspen	Populus grandidentata	NSL	Medium	18.2	95.0	2.5	No change	Sm. dec.	Medium	Common	Fair	Poor			1	24
white oak	Quercus alba	WDH	Medium	28.5	88.7	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
bur oak	Quercus macrocarpa	NDH	Medium	21.4	87.9	5.0	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	26
yellow birch	Betula alleghaniensis	NDL	High	23.9	83.4	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	27
bitternut hickory	Carya cordiformis	WSL	Low	22.7	81.9	2.9	Sm. dec.	No change	High	Common	Fair	Good	Infill +	Infill ++	1	28
Scots pine	Pinus sylvestris	NSH	FIA	7.4	78.7	7.7	Unknown	Unknown	NA	Common	NNIS	NNIS			0	29
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	25.9	65.5	1.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	30
jack pine	Pinus banksiana	NSH	Medium	7.1	64.8	5.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	31
American beech	Fagus grandifolia	WDH	High	19.5	46.1	2.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	32
slippery elm	Ulmus rubra	WSL	Low	14.9	39.7	2.9	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	33
swamp white oak	Quercus bicolor	NSL	Low	6.3	35.6	5.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
peachleaf willow	Salix amygdaloides	NSLX	FIA	3.4	29.1	5.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
hackberry	Celtis occidentalis	WDH	Medium	3.4	28.9	8.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
black spruce	Picea mariana	NSH	High	7.5	23.4	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
Siberian elm	Ulmus pumila	NDH	FIA	2.1	22.7	9.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
honeylocust	Gleditsia triacanthos	NSH	Low	2.1	22.5	9.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	39
shagbark hickory	Carya ovata	WSL	Medium	20.1	20.0	6.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	40
balsam poplar	Populus balsamifera	NSH	Medium	8.6	12.4	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
black oak	Quercus velutina	WDH	High	2.8	12.0	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	42
pin cherry	Prunus pennsylvanica	NSL	Low	6	10.9	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	43
chokecherry	Prunus virginiana	NSLX	FIA	12.2	7.8	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	10.5	7.7	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
rock elm	Ulmus thomasii	NSLX	FIA	6.1	5.5	1.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	46
serviceberry	Amelanchier spp.	NSL	Low	5.6	3.7	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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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
butternut	Juglans cinerea	NSLX	FIA	1.5	3.0	0.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 48
Norway spruce	Picea abies	NSH	FIA	1.1	1.6	1.4	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 49
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 50
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 51
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 52
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 53
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 54
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 55
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 56
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 57
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 58
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 59
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 60
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 61
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 62
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 63
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 64
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 65
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 66
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 67
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 68
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 69