

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	9,273.2	3,580.4	406

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	20	18	Increase	16	18	Very Good	6	6	Likely	3	3
Hickory	4		Medium	24	39	No Change	3	3	Good	9	12	Infill	6	8
Maple	6	Abundant	Low	19	9	Decrease	24	22	Fair	7	5	Migrate	1	9
Oak	6	Common	FIA	6		New	14	15	Poor	12	10		10	20
Pine	4	Rare				Unknown	12	11	Very Poor	4	2			
Other	27	Absent					69	69	FIA Only	3	3			
	49	69		69	66				Unknown	6	5			
										47	43			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	45.6	47.5	50.0	50.1	
	CCSM85	45.6	47.9	50.5	53.7	
	GFDL45	45.6	48.4	51.7	52.9	
	GFDL85	45.6	49.1	52.9	57.3	
	HAD45	45.6	48.6	51.9	53.6	
HAD85	45.6	48.6	53.0	58.2		
Growing Season (May—Sep)	CCSM45	61.8	63.8	66.0	66.4	
	CCSM85	61.8	64.1	66.7	70.7	
	GFDL45	61.8	64.9	69.3	71.0	
	GFDL85	61.8	66.4	70.7	75.7	
	HAD45	61.8	65.2	68.1	70.5	
HAD85	61.8	64.8	70.0	75.9		
Coldest Month Average	CCSM45	20.3	22.3	24.3	24.5	
	CCSM85	20.3	23.2	24.4	26.3	
	GFDL45	20.3	23.3	24.6	25.2	
	GFDL85	20.3	23.7	25.1	27.1	
	HAD45	20.3	21.7	24.7	24.8	
HAD85	20.3	22.9	25.1	28.1		
Warmest Month Average	CCSM45	67.5	69.8	71.1	71.4	
	CCSM85	67.5	70.2	71.8	74.2	
	GFDL45	67.5	70.5	73.0	74.3	
	GFDL85	67.5	72.3	74.8	78.0	
	HAD45	67.5	71.3	73.1	74.9	
HAD85	67.5	71.7	75.1	79.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.0	45.1	44.7	47.3	
	CCSM85	44.0	45.3	46.8	48.6	
	GFDL45	44.0	48.6	49.9	49.4	
	GFDL85	44.0	45.5	49.7	50.4	
	HAD45	44.0	44.8	45.2	45.3	
HAD85	44.0	46.3	43.5	47.3		
Growing Season (May—Sep)	CCSM45	21.4	21.7	21.2	22.4	
	CCSM85	21.4	21.0	21.9	21.9	
	GFDL45	21.4	22.7	22.1	21.5	
	GFDL85	21.4	20.8	21.6	20.9	
	HAD45	21.4	21.5	19.6	20.5	
HAD85	21.4	21.6	18.6	19.5		

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	ChngCI45	ChngCI85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	98.9	2757.7	20.7	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
black cherry	Prunus serotina	WDL	Medium	85	1593.0	14.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
sugar maple	Acer saccharum	WDH	High	76.4	1260.9	12.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
American beech	Fagus grandifolia	WDH	High	77.4	809.5	8.3	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
sweet birch	Betula lenta	NDH	High	87.6	804.4	6.8	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	5
eastern hemlock	Tsuga canadensis	NSH	High	60.2	685.2	8.3	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	6
northern red oak	Quercus rubra	WDH	Medium	60.6	633.7	7.7	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	7
white oak	Quercus alba	WDH	Medium	36.3	338.0	7.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
white ash	Fraxinus americana	WDL	Medium	46.2	288.7	4.4	No change	Sm. inc.	Low	Common	Poor	Fair			1	9
chestnut oak	Quercus prinus	NDH	High	32.6	283.3	6.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
yellow birch	Betula alleghaniensis	NDL	High	59.7	258.5	3.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
pin cherry	Prunus pensylvanica	NSL	Low	26.7	178.1	5.7	Lg. dec.	Very Lg. dec.	Medium	Common	Poor	Lost			0	12
bigtooth aspen	Populus grandidentata	NSL	Medium	26.3	169.5	4.6	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
eastern white pine	Pinus strobus	WDH	High	29	157.8	3.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	14
quaking aspen	Populus tremuloides	WDH	High	18.6	141.0	4.3	Lg. dec.	Very Lg. dec.	Medium	Common	Poor	Lost			0	15
serviceberry	Amelanchier spp.	NSL	Low	52.3	126.3	2.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
sassafras	Sassafras albidum	WSL	Low	21	93.1	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
American basswood	Tilia americana	WSL	Medium	25.5	87.3	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
yellow-poplar	Liriodendron tulipifera	WDH	High	19.3	83.5	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	30	82.8	2.2	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
blackgum	Nyssa sylvatica	WDL	Medium	21.3	71.4	2.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
black locust	Robinia pseudoacacia	NDH	Low	5.1	63.3	3.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
red pine	Pinus resinosa	NSH	Medium	8	49.6	5.5	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	23
striped maple	Acer pensylvanicum	NSL	Medium	29.9	48.8	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32.4	48.3	1.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			1	25
cucumbertree	Magnolia acuminata	NSL	Low	25.9	45.0	1.4	Sm. inc.	No change	Medium	Rare	Fair	Poor			1	26
black oak	Quercus velutina	WDH	High	17.3	44.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	27
white spruce	Picea glauca	NSL	Medium	4.6	39.5	5.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	28
Norway spruce	Picea abies	NSH	FIA	6	28.5	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
Scots pine	Pinus sylvestris	NSH	FIA	9.2	27.9	2.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
scarlet oak	Quercus coccinea	WDL	Medium	6.4	25.7	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
pignut hickory	Carya glabra	WDL	Medium	11.7	25.4	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	32
bitternut hickory	Carya cordiformis	WSL	Low	5.2	19.5	3.4	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	33
Norway maple	Acer platanoides	NSL	FIA	0.2	18.0	3.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
paper birch	Betula papyrifera	WDH	High	2.9	12.7	3.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	35
pitch pine	Pinus rigida	NSH	High	4.2	11.5	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
silver maple	Acer saccharinum	NSH	Low	1.1	7.4	6.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	37
shagbark hickory	Carya ovata	WSL	Medium	6.1	6.9	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	38
American elm	Ulmus americana	WDH	Medium	6.5	6.4	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	39
mockernut hickory	Carya alba	WDL	Medium	1.8	5.2	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
black ash	Fraxinus nigra	WSH	Medium	1.1	3.9	3.6	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	41
black willow	Salix nigra	NSH	Low	1.1	2.8	2.6	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	42
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.1	2.3	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
gray birch	Betula populifolia	NSL	Low	1.1	1.5	1.4	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
American chestnut	Castanea dentata	NSLX	FIA	1.7	0.9	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
flowering dogwood	Cornus florida	WDL	Medium	1.1	0.7	0.6	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++	2	46
slippery elm	Ulmus rubra	WSL	Low	0.9	0.6	0.5	No change	Lg. inc.	Medium	Rare	Poor	Good			2	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
chokecherry	Prunus virginiana	NSLX	FIA	1.1	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 48
mountain maple	Acer spicatum	NSL	Low	1.1	0.2	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 49
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 50
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 51
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 52
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 53
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 54
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 55
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 56
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0 57
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 58
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 59
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 60
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 61
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 62
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 63
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 64
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 65
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 66
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 67
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 68
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 69