

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	7,321.0	2,826.6	497

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	19	19	Increase	17	15	Very Good	4	4	Likely	1	1
Hickory	0			Medium	24	31	No Change	4	5	Good	13	11	Infill	4	5
Maple	5	Abundant	6	Low	19	13	Decrease	10	11	Fair	7	8	Migrate	11	14
Oak	2	Common	16	FIA	2		New	29	31	Poor	4	5		16	20
Pine	4	Rare	11				Unknown	4	2	Very Poor	2	2			
Other	19	Absent	31					64	64	FIA Only	1	1			
	33		64		64	63				Unknown	2	0			
											33	31			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	40.3	41.9	45.0	45.0	
	CCSM85	40.3	42.7	45.9	49.5	
	GFDL45	40.3	43.4	46.5	48.0	
	GFDL85	40.3	43.9	47.6	53.1	
	HAD45	40.3	43.7	47.0	49.0	
	HAD85	40.3	44.0	48.1	54.1	
Growing Season (May—Sep)	CCSM45	59.7	61.3	63.9	64.0	
	CCSM85	59.7	62.0	64.8	68.8	
	GFDL45	59.7	63.8	67.8	70.0	
	GFDL85	59.7	64.5	69.0	75.4	
	HAD45	59.7	63.0	65.4	67.9	
	HAD85	59.7	62.9	66.9	72.9	
Coldest Month Average	CCSM45	10.3	11.4	14.0	13.8	
	CCSM85	10.3	11.8	14.1	16.6	
	GFDL45	10.3	13.0	15.1	15.6	
	GFDL85	10.3	14.0	15.7	18.8	
	HAD45	10.3	12.4	16.5	16.4	
	HAD85	10.3	15.5	18.3	22.7	
Warmest Month Average	CCSM45	65.9	67.7	69.3	69.6	
	CCSM85	65.9	68.6	70.4	72.8	
	GFDL45	65.9	70.4	72.1	73.7	
	GFDL85	65.9	71.0	73.5	76.5	
	HAD45	65.9	69.5	70.5	72.3	
	HAD85	65.9	69.6	71.7	75.7	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	32.3	33.8	33.5	33.4	
	CCSM85	32.3	31.9	32.9	33.4	
	GFDL45	32.3	35.1	36.5	35.6	
	GFDL85	32.3	34.7	38.1	37.9	
	HAD45	32.3	33.7	34.6	34.5	
	HAD85	32.3	33.9	35.7	36.9	
Growing Season (May—Sep)	CCSM45	17.3	18.0	16.7	17.2	
	CCSM85	17.3	16.9	17.0	15.9	
	GFDL45	17.3	18.8	18.8	18.4	
	GFDL85	17.3	18.7	19.9	18.5	
	HAD45	17.3	17.1	16.6	16.1	
	HAD85	17.3	17.1	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
sugar maple	Acer saccharum	WDH	High	93.3	2518.8	18.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
quaking aspen	Populus tremuloides	WDH	High	91.1	1540.6	12.2	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	2
red maple	Acer rubrum	WDH	High	98.2	1466.3	9.9	No change	No change	High	Abundant	Very Good	Very Good			1	3
balsam fir	Abies balsamea	NDH	High	95.4	1069.9	7.6	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
eastern hemlock	Tsuga canadensis	NSH	High	71.3	589.2	5.4	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	5
yellow birch	Betula alleghaniensis	NDL	High	75.9	505.0	4.2	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
northern white-cedar	Thuja occidentalis	WSH	High	62.2	478.4	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
white spruce	Picea glauca	NSL	Medium	82.7	455.8	3.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
eastern white pine	Pinus strobus	WDH	High	51.7	422.9	5.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
red pine	Pinus resinosa	NSH	Medium	33.5	394.4	7.5	Sm. inc.	No change	Low	Common	Fair	Poor			1	10
paper birch	Betula papyrifera	WDH	High	63.7	373.3	3.1	Sm. inc.	No change	Medium	Common	Good	Fair			1	11
black spruce	Picea mariana	NSH	High	61.3	335.8	3.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
American basswood	Tilia americana	WSL	Medium	64.5	322.0	3.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
black ash	Fraxinus nigra	WSH	Medium	69.5	281.5	3.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	14
tamarack (native)	Larix laricina	NSH	High	38.5	238.8	3.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
northern red oak	Quercus rubra	WDH	Medium	38.5	228.6	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
bigtooth aspen	Populus grandidentata	NSL	Medium	44.8	192.3	2.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	17
white ash	Fraxinus americana	WDL	Medium	43.6	177.7	2.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	18
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	60.4	120.1	1.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
black cherry	Prunus serotina	WDL	Medium	66.1	118.3	1.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	20
jack pine	Pinus banksiana	NSH	Medium	14.1	116.6	4.6	No change	No change	High	Common	Good	Good			1	21
American elm	Ulmus americana	WDH	Medium	39.5	54.7	1.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
northern pin oak	Quercus ellipsoidalis	NSH	Medium	12.7	36.7	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	23
green ash	Fraxinus pennsylvanica	WSH	Low	12.4	27.6	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	24
chokecherry	Prunus virginiana	NSLX	FIA	6.3	17.8	2.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	25
silver maple	Acer saccharinum	NSH	Low	2.7	17.6	6.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	26
serviceberry	Amelanchier spp.	NSL	Low	14.9	10.5	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	5.5	7.3	1.3	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	28
balsam poplar	Populus balsamifera	NSH	Medium	7.2	7.1	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
pin cherry	Prunus pensylvanica	NSL	Low	9.6	5.6	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	30
boxelder	Acer negundo	WSH	Low	3.1	4.2	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	31
mountain maple	Acer spicatum	NSL	Low	8.4	3.8	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	32
Scots pine	Pinus sylvestris	NSH	FIA	2	3.4	1.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	34
red spruce	Picea rubens	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	35
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	36
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	37
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	38
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	39
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	40
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	41
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	42
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	43
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	45
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	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
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	48
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
eastern cottonwood	<i>Populus deltoides</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
white oak	<i>Quercus alba</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	51
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	52
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	53
bur oak	<i>Quercus macrocarpa</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	55
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	56
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	57
black oak	<i>Quercus velutina</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	58
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	59
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	60
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	61
sassafras	<i>Sassafras albidum</i>	WDL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	62
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	63
slippery elm	<i>Ulmus rubra</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64