

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 8,532.9 3,294.6 208

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	Scenario	Scenario	Scenario	SHIFT	SHIFT			
				High	Low	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2			12	15	Increase	11	10	Very Good	5	3	Likely	4	4
Hickory	0			19	29	No Change	5	7	Good	6	8	Infill	7	6
Maple	4	Abundant	4	19	10	Decrease	13	12	Fair	6	9	Migrate	6	10
Oak	3	Common	16	5		New	17	18	Poor	9	5		17	20
Pine	3	Rare	14			Unknown	9	8	Very Poor	3	3			
Other	22	Absent	19						FIA Only	4	4			
	34		53				55	55	Unknown	4	3			
										37	35			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	41.2	42.8	45.8	46.3
	CCSM85	41.2	43.7	47.1	50.7
	GFDL45	41.2	44.9	46.3	48.0
	GFDL85	41.2	44.2	47.6	52.5
	HAD45	41.2	44.1	47.9	49.7
HAD85	41.2	44.7	49.2	54.8	
Growing Season May—Sep	CCSM45	62.9	64.7	67.2	67.8
	CCSM85	62.9	65.5	68.8	72.9
	GFDL45	62.9	67.0	68.9	71.0
	GFDL85	62.9	66.4	70.1	75.7
	HAD45	62.9	65.8	68.7	70.8
HAD85	62.9	65.6	69.9	75.6	
Coldest Month Average	CCSM45	6.2	8.0	10.3	10.7
	CCSM85	6.2	7.8	10.4	12.9
	GFDL45	6.2	9.8	11.3	11.8
	GFDL85	6.2	10.3	11.9	15.0
	HAD45	6.2	8.1	12.2	11.9
HAD85	6.2	11.6	15.4	19.0	
Warmest Month Average	CCSM45	69.6	71.8	73.3	73.9
	CCSM85	69.6	73.2	75.3	77.8
	GFDL45	69.6	73.0	74.5	76.1
	GFDL85	69.6	73.5	75.5	78.8
	HAD45	69.6	72.7	74.3	76.1
HAD85	69.6	73.0	75.5	79.3	

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	25.7	26.9	27.1	26.3
	CCSM85	25.7	26.3	25.6	26.0
	GFDL45	25.7	29.0	30.7	28.4
	GFDL85	25.7	29.3	31.7	30.7
	HAD45	25.7	27.8	26.2	28.0
HAD85	25.7	28.0	26.8	28.6	
Growing Season May—Sep	CCSM45	17.2	17.3	16.9	16.8
	CCSM85	17.2	16.8	15.7	15.3
	GFDL45	17.2	19.6	20.4	18.6
	GFDL85	17.2	19.6	20.6	19.3
	HAD45	17.2	17.6	16.3	16.5
HAD85	17.2	17.8	15.4	15.1	

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
bur oak	Quercus macrocarpa	NDH	Medium	81.5	1397.5	17.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
quaking aspen	Populus tremuloides	WDH	High	62.7	1293.4	16.9	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	2
American basswood	Tilia americana	WSL	Medium	62.5	721.0	11.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
tamarack (native)	Larix laricina	NSH	High	24.2	624.5	21.2	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
black ash	Fraxinus nigra	WSH	Medium	53.8	483.0	8.1	No change	Sm. dec.	Low	Common	Poor	Poor			0	5
green ash	Fraxinus pennsylvanica	WSH	Low	67.2	464.1	8.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
sugar maple	Acer saccharum	WDH	High	37.4	441.8	10.7	No change	No change	High	Common	Good	Good			1	7
American elm	Ulmus americana	WDH	Medium	74.3	410.4	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
paper birch	Betula papyrifera	WDH	High	37.2	335.0	7.0	No change	No change	Medium	Common	Fair	Fair			1	9
northern red oak	Quercus rubra	WDH	Medium	50.5	318.4	7.1	Sm. inc.	No change	High	Common	Very Good	Good			1	10
red pine	Pinus resinosa	NSH	Medium	15.9	303.5	13.7	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	11
boxelder	Acer negundo	WSH	Low	31.4	302.4	12.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
bigtooth aspen	Populus grandidentata	NSL	Medium	29.8	267.5	6.5	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	56.8	206.0	3.6	Sm. inc.	No change	High	Common	Very Good	Good			1	14
jack pine	Pinus banksiana	NSH	Medium	11.4	167.7	8.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	15
northern pin oak	Quercus ellipsoidalis	NSH	Medium	16.8	140.9	7.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
balsam fir	Abies balsamea	NDH	High	12.7	105.2	4.6	Sm. dec.	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	17
white spruce	Picea glauca	NSL	Medium	15.4	98.6	4.7	Sm. dec.	No change	Medium	Common	Poor	Fair			1	18
balsam poplar	Populus balsamifera	NSH	Medium	24.6	89.1	3.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
red maple	Acer rubrum	WDH	High	12.8	75.9	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
black cherry	Prunus serotina	WDL	Medium	28.8	49.8	1.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	21
eastern white pine	Pinus strobus	WDH	High	6.4	38.7	5.2	Sm. inc.	No change	Low	Rare	Poor	Very Poor	Infill +		1	22
black spruce	Picea mariana	NSH	High	4.7	26.8	4.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	23
pin cherry	Prunus pensylvanica	NSL	Low	5.4	13.4	2.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	24
serviceberry	Amelanchier spp.	NSL	Low	7	12.7	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
slippery elm	Ulmus rubra	WSL	Low	11	11.2	2.7	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	26
chokecherry	Prunus virginiana	NSLX	FIA	24.3	8.6	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.4	3.6	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	28
rock elm	Ulmus thomasii	NSLX	FIA	1.2	3.4	2.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	29
hackberry	Celtis occidentalis	WDH	Medium	1.2	2.6	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	30
eastern cottonwood	Populus deltoides	NSH	Low	0.6	1.8	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	31
Siberian elm	Ulmus pumila	NDH	FIA	1.2	1.5	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	32
wild plum	Prunus americana	NSLX	FIA	5	0.8	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	33
mountain maple	Acer spicatum	NSL	Low	0.2	0.5	0.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	35
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	36
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	37
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	38
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	39
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	40
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	41
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	42
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	43
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	44
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	45
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	46
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	48
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	51
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	54
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	55