

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 5,292.3 2,043.4 220

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	16	17	Increase	11	12	Very Good	6	6	Likely	3	3
Hickory	0			Medium	21	31	No Change	4	2	Good	8	7	Infill	2	3
Maple	2	Abundant	9	Low	20	11	Decrease	18	19	Fair	7	6	Migrate	10	15
Oak	6	Common	18	FIA	4		New	20	21	Poor	6	9		15	21
Pine	4	Rare	10				Unknown	8	7	Very Poor	5	4			
Other	22	Absent	23							FIA Only	2	2			
	37		60		61	59		61	61	Unknown	4	3			
											38	37			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.2	46.0	49.1	48.9	
	CCSM85	44.2	46.7	49.8	53.2	
	GFDL45	44.2	47.2	50.2	51.5	
	GFDL85	44.2	47.6	51.5	56.4	
	HAD45	44.2	47.6	50.8	52.8	
Growing Season (May—Sep)	CCSM45	61.9	63.5	65.8	66.0	
	CCSM85	61.9	64.0	66.7	70.6	
	GFDL45	61.9	65.7	69.6	71.4	
	GFDL85	61.9	66.4	71.1	76.6	
	HAD45	61.9	65.4	67.6	70.1	
Coldest Month Average	CCSM45	17.4	19.0	22.0	21.7	
	CCSM85	17.4	20.2	22.6	24.9	
	GFDL45	17.4	19.4	21.4	22.0	
	GFDL85	17.4	20.4	22.1	24.7	
	HAD45	17.4	19.1	23.0	23.3	
Warmest Month Average	CCSM45	68.2	70.3	71.7	72.1	
	CCSM85	68.2	71.1	72.8	74.8	
	GFDL45	68.2	72.1	73.9	75.2	
	GFDL85	68.2	72.8	75.2	78.2	
	HAD45	68.2	71.9	73.0	74.8	
HAD85	68.2	72.3	74.6	78.8		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	29.9	29.6	28.9	30.4	
	CCSM85	29.9	30.3	29.6	30.5	
	GFDL45	29.9	31.9	34.5	33.6	
	GFDL85	29.9	32.2	34.6	35.1	
	HAD45	29.9	31.5	32.7	32.5	
Growing Season (May—Sep)	CCSM45	15.7	16.1	15.1	15.7	
	CCSM85	15.7	16.1	15.1	14.7	
	GFDL45	15.7	16.0	17.2	16.8	
	GFDL85	15.7	16.7	16.3	15.8	
	HAD45	15.7	15.8	14.6	15.2	
HAD85	15.7	16.0	13.5	14.4		

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	78.7	1494.2	13.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
quaking aspen	Populus tremuloides	WDH	High	67.6	973.5	10.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	2
northern red oak	Quercus rubra	WDH	Medium	61.6	948.1	11.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
red pine	Pinus resinosa	NSH	Medium	49.4	837.3	14.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
jack pine	Pinus banksiana	NSH	Medium	35.5	742.4	17.1	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	5
northern white-cedar	Thuja occidentalis	WSH	High	32.5	661.9	15.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
bigtooth aspen	Populus grandidentata	NSL	Medium	50.1	642.2	9.1	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	7
green ash	Fraxinus pennsylvanica	WSH	Low	35	536.1	7.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	8
eastern white pine	Pinus strobus	WDH	High	60.1	515.6	6.2	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	9
northern pin oak	Quercus ellipsoidalis	NSH	Medium	34.6	351.6	8.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	10
sugar maple	Acer saccharum	WDH	High	27.6	316.0	8.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
white ash	Fraxinus americana	WDL	Medium	38.2	315.2	6.8	Sm. dec.	No change	Low	Common	Poor	Poor			0	12
balsam fir	Abies balsamea	NDH	High	57.1	293.6	4.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	13
white oak	Quercus alba	WDH	Medium	40.7	278.2	5.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
black oak	Quercus velutina	WDH	High	42.5	239.9	4.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
balsam poplar	Populus balsamifera	NSH	Medium	25.6	216.2	6.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	16
black spruce	Picea mariana	NSH	High	24	206.7	6.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
white spruce	Picea glauca	NSL	Medium	32.3	184.7	4.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
paper birch	Betula papyrifera	WDH	High	55.3	176.3	2.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
American basswood	Tilia americana	WSL	Medium	26.4	145.7	4.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
tamarack (native)	Larix laricina	NSH	High	14.8	123.9	6.6	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	21
black cherry	Prunus serotina	WDL	Medium	49.6	108.1	1.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	22
Scots pine	Pinus sylvestris	NSH	FIA	5.7	99.6	17.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	23
American beech	Fagus grandifolia	WDH	High	17.5	76.9	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	24
Norway spruce	Picea abies	NSH	FIA	3.8	70.1	18.6	Unknown	Unknown	NA	Common	NNIS	NNIS			0	25
American elm	Ulmus americana	WDH	Medium	20.6	62.0	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
black ash	Fraxinus nigra	WSH	Medium	34.4	50.6	1.2	Lg. inc.	Sm. inc.	Low	Common	Good	Fair			1	27
eastern hemlock	Tsuga canadensis	NSH	High	14	30.6	1.6	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	28
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.5	30.4	1.2	No change	Lg. dec.	High	Rare	Fair	Poor			1	29
yellow birch	Betula alleghaniensis	NDL	High	3.7	11.2	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
serviceberry	Amelanchier spp.	NSL	Low	18.8	8.5	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
pin oak	Quercus palustris	NSH	Low	1.4	7.4	2.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	32
bur oak	Quercus macrocarpa	NDH	Medium	1.4	2.3	0.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	33
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.6	1.7	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
pin cherry	Prunus pensylvanica	NSL	Low	1.9	1.0	0.5	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	35
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	3	0.9	0.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
chokecherry	Prunus virginiana	NSLX	FIA	3	0.7	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	38
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	39
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	40
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	41
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	42
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	43
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	45
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	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
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	48
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	50
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	51
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	52
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	54
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	55
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	56
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	58
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	59
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	60
slippery elm	Ulmus rubra	WSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	61