

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 8,686.5 3,353.9 211

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									
Hickory	1									
Maple	4	Abundant 6	High 13	20	Increase 14	14	Very Good 8	9	Likely 2	2
Oak	4	Common 20	Medium 22	32	No Change 12	13	Good 8	8	Infill 16	17
Pine	4	Rare 17	Low 23	10	Decrease 11	10	Fair 9	7	Migrate 7	8
Other	28	Absent 21	FIA 6		New 19	19	Poor 7	8		
	43	64	64	62	Unknown 8	8	Very Poor 5	5		
						64	64	FIA Only 4	4	
								Unknown 2	2	
								43	43	

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	43.5	45.3	48.4	48.7	
Average	CCSM85	43.5	46.2	49.5	53.1	
	GFDL45	43.5	47.3	49.0	50.5	
	GFDL85	43.5	46.8	50.2	55.2	
	HAD45	43.5	46.5	50.4	52.3	
	HAD85	43.5	47.1	51.6	57.1	
Growing Season	CCSM45	64.3	66.2	68.9	69.4	
	CCSM85	64.3	67.2	70.3	74.5	
May—Sep	GFDL45	64.3	68.7	70.8	72.8	
	GFDL85	64.3	68.2	71.9	77.6	
	HAD45	64.3	67.4	70.5	72.7	
	HAD85	64.3	67.5	72.1	77.6	
Coldest Month	CCSM45	10.0	11.7	14.0	14.6	
	CCSM85	10.0	11.9	14.2	16.7	
Average	GFDL45	10.0	13.7	15.3	15.7	
	GFDL85	10.0	13.9	15.7	18.8	
	HAD45	10.0	11.7	16.0	15.9	
	HAD85	10.0	15.5	19.1	22.5	
Warmest Month	CCSM45	70.8	73.1	74.6	75.2	
	CCSM85	70.8	74.4	76.4	79.0	
Average	GFDL45	70.8	74.0	75.5	77.1	
	GFDL85	70.8	74.9	76.8	80.3	
	HAD45	70.8	74.2	75.8	77.4	
	HAD85	70.8	75.0	77.4	81.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	30.2	31.2	30.9	30.2	
Total	CCSM85	30.2	29.9	29.5	29.9	
	GFDL45	30.2	33.5	35.2	32.2	
	GFDL85	30.2	33.4	36.5	35.0	
	HAD45	30.2	32.5	31.5	32.2	
	HAD85	30.2	31.7	32.1	34.1	
Growing Season	CCSM45	19.2	19.3	18.6	18.1	
	CCSM85	19.2	18.4	17.0	16.5	
May—Sep	GFDL45	19.2	21.2	21.6	19.1	
	GFDL85	19.2	21.2	21.7	19.7	
	HAD45	19.2	19.5	18.0	18.2	
	HAD85	19.2	18.8	17.1	17.2	

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
quaking aspen	Populus tremuloides	WDH	High	60.7	1506.0	20.4	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
bur oak	Quercus macrocarpa	NDH	Medium	60.1	786.5	10.0	No change	No change	High	Abundant	Very Good	Very Good			1	2
northern red oak	Quercus rubra	WDH	Medium	59.4	755.3	11.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
green ash	Fraxinus pennsylvanica	WSH	Low	64.8	681.5	10.7	No change	No change	Medium	Abundant	Good	Good			1	4
American basswood	Tilia americana	WSL	Medium	49.6	645.7	11.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	5
American elm	Ulmus americana	WDH	Medium	79.9	593.3	7.5	No change	Sm. inc.	Medium	Abundant	Good	Very Good			1	6
black ash	Fraxinus nigra	WSH	Medium	49.4	493.1	10.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	7
paper birch	Betula papyrifera	WDH	High	42.5	399.1	6.9	No change	No change	Medium	Common	Fair	Fair			1	8
northern pin oak	Quercus ellipsoidalis	NSH	Medium	23.4	371.6	11.0	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	9
red pine	Pinus resinosa	NSH	Medium	12.9	348.4	20.2	No change	No change	Low	Common	Poor	Poor			0	10
red maple	Acer rubrum	WDH	High	39.7	321.6	5.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
boxelder	Acer negundo	WSH	Low	40.1	297.6	8.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
silver maple	Acer saccharinum	NSH	Low	15.1	248.6	18.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	13
eastern white pine	Pinus strobus	WDH	High	10.3	124.2	7.8	Lg. inc.	No change	Low	Common	Good	Poor	Infill ++	Infill +	1	14
tamarack (native)	Larix laricina	NSH	High	7.3	115.2	13.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	15
white oak	Quercus alba	WDH	Medium	12.6	110.9	8.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
black cherry	Prunus serotina	WDL	Medium	30.8	100.6	2.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	17
sugar maple	Acer saccharum	WDH	High	29.2	96.7	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
Siberian elm	Ulmus pumila	NDH	FIA	5.9	83.9	18.4	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
black willow	Salix nigra	NSH	Low	8.5	81.6	19.3	Sm. dec.	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	20
bigtooth aspen	Populus grandidentata	NSL	Medium	9.3	63.1	5.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	21
black spruce	Picea mariana	NSH	High	1.6	60.8	24.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			2	22
balsam fir	Abies balsamea	NDH	High	1.2	58.2	20.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	23
eastern redcedar	Juniperus virginiana	WDH	Medium	12.5	53.3	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	24
white spruce	Picea glauca	NSL	Medium	5.8	52.4	7.6	No change	No change	Medium	Common	Fair	Fair			1	25
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	29.5	50.7	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
slippery elm	Ulmus rubra	WSL	Low	19.8	42.0	3.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	27
eastern cottonwood	Populus deltoides	NSH	Low	1.7	38.0	9.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	28
jack pine	Pinus banksiana	NSH	Medium	3.5	36.2	10.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	29
Scots pine	Pinus sylvestris	NSH	FIA	3.8	36.1	4.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
black walnut	Juglans nigra	WDH	Low	2.3	29.6	12.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	31
butternut	Juglans cinerea	NSLX	FIA	18.3	28.3	2.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	32
balsam poplar	Populus balsamifera	NSH	Medium	0.9	24.8	17.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	33
hackberry	Celtis occidentalis	WDH	Medium	8.3	22.7	4.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	34
serviceberry	Amelanchier spp.	NSL	Low	3.9	19.8	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
chokecherry	Prunus virginiana	NSLX	FIA	13.2	15.2	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	7.6	10.8	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
pin cherry	Prunus pensylvanica	NSL	Low	2.4	9.9	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
yellow birch	Betula alleghaniensis	NDL	High	3.3	9.0	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
bitternut hickory	Carya cordiformis	WSL	Low	9.4	7.8	1.2	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
wild plum	Prunus americana	NSLX	FIA	0.5	2.5	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
American mountain-ash	Sorbus americana	NSL	Low	0.5	2.1	0.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	42
peachleaf willow	Salix amygdaloides	NSLX	FIA	3.7	0.8	2.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	44
mountain maple	Acer spicatum	NSL	Low	0	0	0	New Habitat	Unknown	High	Absent	New Habitat	Unknown			3	45
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	46
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	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
shagbark hickory	<i>Carya ovata</i>	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	50
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	51
white ash	<i>Fraxinus americana</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	52
honeylocust	<i>Gleditsia triacanthos</i>	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	54
red mulberry	<i>Morus rubra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	58
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	59
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	60
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	61
black oak	<i>Quercus velutina</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	62
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	63
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64