

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

Area of Region sq. km sq. mi FIA Plots
 2,654.4 1,024.9 34

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	15	18	Increase	12	13	Very Good	1	0	Likely	1	1
Hickory	2			Medium	22	26	No Change	5	5	Good	11	14	Infill	4	4
Maple	4	Abundant	1	Low	17	12	Decrease	16	15	Fair	8	6	Migrate	7	9
Oak	5	Common	14	FIA	4		New	20	20	Poor	3	4			
Pine	3	Rare	22				Unknown	5	5	Very Poor	10	8			
Other	20	Absent	21							FIA Only	2	2			
	37		58		58	56		58	58	Unknown	1	1			
											36	35			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	48.5	50.5	53.2	53.1	
	CCSM85	48.5	50.9	53.7	56.9	
	GFDL45	48.5	55.2	54.8	56.1	
	GFDL85	48.5	52.1	56.1	60.9	
	HAD45	48.5	51.8	55.2	57.0	
	HAD85	48.5	51.9	56.2	61.8	
Growing Season (May—Sep)	CCSM45	65.4	67.4	69.6	69.8	
	CCSM85	65.4	67.6	70.2	74.1	
	GFDL45	65.4	73.3	72.9	74.5	
	GFDL85	65.4	69.8	74.4	79.6	
	HAD45	65.4	68.9	71.7	74.1	
	HAD85	65.4	68.5	73.3	79.3	
Coldest Month Average	CCSM45	22.7	24.8	27.3	27.3	
	CCSM85	22.7	26.1	27.5	29.6	
	GFDL45	22.7	25.5	27.5	28.2	
	GFDL85	22.7	26.4	28.2	30.7	
	HAD45	22.7	24.8	28.2	28.3	
	HAD85	22.7	26.2	28.9	32.6	
Warmest Month Average	CCSM45	71.6	73.9	75.3	75.5	
	CCSM85	71.6	74.4	76.1	78.3	
	GFDL45	71.6	74.6	77.0	78.0	
	GFDL85	71.6	75.9	78.5	81.4	
	HAD45	71.6	75.5	77.0	78.8	
	HAD85	71.6	75.5	78.6	83.1	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	34.0	33.9	32.5	35.1	
	CCSM85	34.0	35.0	34.6	34.5	
	GFDL45	34.0	37.6	39.0	38.4	
	GFDL85	34.0	35.3	38.1	39.4	
	HAD45	34.0	34.8	36.1	36.1	
	HAD85	34.0	36.0	34.5	38.0	
Growing Season (May—Sep)	CCSM45	16.0	15.9	14.4	15.8	
	CCSM85	16.0	15.5	15.0	14.0	
	GFDL45	16.0	16.8	16.3	16.0	
	GFDL85	16.0	15.8	15.6	15.1	
	HAD45	16.0	15.7	14.4	15.4	
	HAD85	16.0	15.8	13.6	14.3	

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
green ash	Fraxinus pennsylvanica	WSH	Low	84.7	537.5	16.2	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	1
silver maple	Acer saccharinum	NSH	Low	38.9	474.8	17.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	2
red maple	Acer rubrum	WDH	High	81.7	341.0	8.6	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
bitternut hickory	Carya cordiformis	WSL	Low	15.3	200.8	3.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
sugar maple	Acer saccharum	WDH	High	34.1	183.5	7.6	Sm. inc.	No change	High	Common	Very Good	Good			1	5
red pine	Pinus resinosa	NSH	Medium	7.2	178.4	10.2	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	6
white ash	Fraxinus americana	WDL	Medium	69.2	154.8	5.5	Sm. inc.	No change	Low	Common	Fair	Poor			1	7
Norway spruce	Picea abies	NSH	FIA	27.9	142.9	9.8	Unknown	Unknown	NA	Common	NNIS	NNIS			0	8
American beech	Fagus grandifolia	WDH	High	35.1	123.2	4.3	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	9
black locust	Robinia pseudoacacia	NDH	Low	34.8	98.7	7.6	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	10
black cherry	Prunus serotina	WDL	Medium	49.7	96.3	3.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
boxelder	Acer negundo	WSH	Low	53.4	94.0	3.6	Sm. dec.	No change	High	Common	Fair	Good			1	12
shagbark hickory	Carya ovata	WSL	Medium	28.1	56.3	2.7	No change	No change	Medium	Common	Fair	Fair			1	13
white oak	Quercus alba	WDH	Medium	6.1	54.9	5.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	14
American basswood	Tilia americana	WSL	Medium	48.4	53.1	3.9	No change	Sm. dec.	Medium	Common	Fair	Poor			1	15
eastern cottonwood	Populus deltoides	NSH	Low	27.3	48.8	6.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	16
American elm	Ulmus americana	WDH	Medium	63.1	48.3	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	17
black willow	Salix nigra	NSH	Low	37.4	39.3	4.0	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor			1	18
quaking aspen	Populus tremuloides	WDH	High	28.9	38.0	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	19
black walnut	Juglans nigra	WDH	Low	25.8	25.0	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	20
bigtooth aspen	Populus grandidentata	NSL	Medium	9.9	24.3	1.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	21
Scots pine	Pinus sylvestris	NSH	FIA	23.1	21.3	10.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	22
black ash	Fraxinus nigra	WSH	Medium	41.8	18.0	1.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	23
northern white-cedar	Thuja occidentalis	WSH	High	2.4	15.8	2.6	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
eastern white pine	Pinus strobus	WDH	High	8	13.4	7.5	No change	Lg. dec.	Low	Rare	Very Poor	Very Poor			2	25
swamp white oak	Quercus bicolor	NSL	Low	32.2	11.5	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	26
chokecherry	Prunus virginiana	NSLX	FIA	22.1	8.8	1.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
butternut	Juglans cinerea	NSLX	FIA	15.1	8.6	9.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	28
sweet birch	Betula lenta	NDH	High	18.2	6.9	1.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	29
eastern hemlock	Tsuga canadensis	NSH	High	3.2	6.6	1.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	30
black oak	Quercus velutina	WDH	High	2.4	5.8	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	31
northern red oak	Quercus rubra	WDH	Medium	33.8	3.1	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	32
yellow-poplar	Liriodendron tulipifera	WDH	High	15	2.5	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	33
yellow birch	Betula alleghaniensis	NDL	High	3.2	1.6	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	21	1.5	0.6	Sm. dec.	Lg. inc.	High	Rare	Poor	Good			1	35
bur oak	Quercus macrocarpa	NDH	Medium	18.8	1.2	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			0	36
slippery elm	Ulmus rubra	WSL	Low	15.1	1.0	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	38
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	39
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	40
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	41
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	42
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	43
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	44
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	45
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	47



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Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	48
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	49
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
northern pin oak	Quercus ellipsoidalis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +		3	51
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	52
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	53
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	54
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	55
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	56
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	57
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	58