

States
Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

sq. km sq. mi FIA Plots
 Area of Region 145,737 56,270 622

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	10	23	Increase	13	14	Very Good	1	1	Likely	0	0
Hickory	4			Medium	26	41	No Change	19	16	Good	10	12	Infill	25	25
Maple	4	Abundant	0	Low	33	11	Decrease	15	17	Fair	12	9	Migrate	5	11
Oak	11	Common	7	FIA	10		New	12	13	Poor	9	11			
Pine	3	Rare	50				Unknown	20	19	Very Poor	15	13			
Other	32	Absent	19							FIA Only	6	6			
	57		76		79	75		79	79	Unknown	10	9			
											63	61			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	48.3	50.3	52.8	53.3	
Average	CCSM85	48.3	51.0	53.7	56.9	
	GFDL45	48.3	54.5	53.5	54.8	
	GFDL85	48.3	51.4	54.6	59.1	
	HAD45	48.3	51.0	54.5	56.2	
	HAD85	48.3	51.7	56.3	60.7	
Growing Season	CCSM45	67.8	70.0	72.3	73.0	
	CCSM85	67.8	70.9	73.5	77.2	
May—Sep	GFDL45	67.8	75.6	74.0	76.0	
	GFDL85	67.8	71.6	75.3	80.8	
	HAD45	67.8	70.3	73.0	75.0	
	HAD85	67.8	70.9	75.8	80.0	
Coldest Month	CCSM45	17.1	19.3	21.4	21.9	
	CCSM85	17.1	19.8	21.5	23.5	
Average	GFDL45	17.1	20.7	21.6	22.0	
	GFDL85	17.1	20.3	22.0	23.7	
	HAD45	17.1	18.8	22.5	22.5	
	HAD85	17.1	21.8	25.4	28.1	
Warmest Month	CCSM45	74.0	76.4	77.9	78.7	
	CCSM85	74.0	78.0	79.8	81.9	
Average	GFDL45	74.0	77.4	78.8	80.4	
	GFDL85	74.0	78.2	79.8	83.7	
	HAD45	74.0	76.4	78.4	79.3	
	HAD85	74.0	78.1	80.9	83.6	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	34.3	34.0	34.2	33.5	
Total	CCSM85	34.3	33.7	34.5	35.0	
	GFDL45	34.3	37.5	40.4	39.4	
	GFDL85	34.3	38.0	41.3	40.5	
	HAD45	34.3	37.5	37.5	37.4	
	HAD85	34.3	35.7	35.4	38.3	
Growing Season	CCSM45	21.1	20.5	20.3	19.9	
	CCSM85	21.1	19.7	19.8	19.5	
May—Sep	GFDL45	21.1	22.7	24.0	22.9	
	GFDL85	21.1	23.3	24.1	22.7	
	HAD45	21.1	22.0	21.1	21.2	
	HAD85	21.1	20.6	19.2	19.1	

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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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
American elm	Ulmus americana	WDH	Medium	50.7	128.2	11.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	1
black walnut	Juglans nigra	WDH	Low	32.7	78.3	12.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	2
bur oak	Quercus macrocarpa	NDH	Medium	24.7	66.7	16.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	3
silver maple	Acer saccharinum	NSH	Low	15.2	58.7	22.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	4
white oak	Quercus alba	WDH	Medium	13.8	56.3	12.7	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	5
boxelder	Acer negundo	WSH	Low	29.5	53.4	12.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	6
hackberry	Celtis occidentalis	WDH	Medium	35	53.1	9.6	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	7
shagbark hickory	Carya ovata	WSL	Medium	20.7	48.5	9.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	8
eastern redcedar	Juniperus virginiana	WDH	Medium	17.8	45.8	10.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	9
American basswood	Tilia americana	WSL	Medium	17.1	41.6	8.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	10
red mulberry	Morus rubra	NSL	Low	25.2	39.9	10.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	11
Osage-orange	Maclura pomifera	NDH	Medium	8	37.8	15.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	12
northern red oak	Quercus rubra	WDH	Medium	16.7	37.5	8.1	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	13
slippery elm	Ulmus rubra	WSL	Low	31.6	36.1	5.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	14
black cherry	Prunus serotina	WDL	Medium	28.8	34.8	6.4	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	15
green ash	Fraxinus pennsylvanica	WSH	Low	17.4	34.3	11.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	16
honeylocust	Gleditsia triacanthos	NSH	Low	16.7	32.4	10.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	17
eastern cottonwood	Populus deltoides	NSH	Low	11	30.0	15.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	18
bitternut hickory	Carya cordiformis	WSL	Low	19.6	29.4	5.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
white ash	Fraxinus americana	WDL	Medium	15.3	27.2	6.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	20
black oak	Quercus velutina	WDH	High	12.4	25.4	6.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	17.5	20.4	5.6	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	22
sugar maple	Acer saccharum	WDH	High	4.6	20.3	6.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	23
shingle oak	Quercus imbricaria	NDH	Medium	7.3	15.7	7.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	24
black willow	Salix nigra	NSH	Low	7.4	14.6	12.6	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			2	25
black locust	Robinia pseudoacacia	NDH	Low	5.1	14.4	12.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	26
black maple	Acer nigrum	NSH	Low	4.3	11.7	10.9	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	27
Siberian elm	Ulmus pumila	NDH	FIA	6.4	6.8	9.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
Ohio buckeye	Aesculus glabra	NSL	Low	2.1	4.7	6.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	29
northern pin oak	Quercus ellipsoidalis	NSH	Medium	4.6	4.2	5.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	30
swamp white oak	Quercus bicolor	NSL	Low	2.2	4.0	4.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	31
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.7	3.7	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
wild plum	Prunus americana	NSLX	FIA	3.8	3.4	6.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	33
bigtooth aspen	Populus grandidentata	NSL	Medium	1.2	2.7	6.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
quaking aspen	Populus tremuloides	WDH	High	2	2.5	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	35
peachleaf willow	Salix amygdaloides	NSLX	FIA	0.6	2.5	6.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
black ash	Fraxinus nigra	WSH	Medium	3.2	2.3	2.2	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			2	37
white mulberry	Morus alba	NSL	FIA	0.7	1.9	2.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	38
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	1.3	1.3	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
pin oak	Quercus palustris	NSH	Low	0.7	1.3	6.4	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	40
mockernut hickory	Carya alba	WDL	Medium	1.4	1.2	2.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	41
sycamore	Platanus occidentalis	NSL	Low	0.8	1.2	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
northern catalpa	Catalpa speciosa	NSHX	FIA	0.1	1.2	17.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
eastern white pine	Pinus strobus	WDH	High	0.4	0.6	1.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	44
river birch	Betula nigra	NSL	Low	1.9	0.6	4.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	45
paper birch	Betula papyrifera	WDH	High	0.7	0.6	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
chokecherry	Prunus virginiana	NSLX	FIA	2.6	0.5	2.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	1.1	0.5	2.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	48
serviceberry	<i>Amelanchier</i> spp.	NSL	Low	1.2	0.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	49
Kentucky coffeetree	<i>Gymnocladus dioicus</i>	NSLX	FIA	0.8	0.2	1.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	50
red pine	<i>Pinus resinosa</i>	NSH	Medium	0.3	0.1	1.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	51
post oak	<i>Quercus stellata</i>	WDH	High	0.3	0.1	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	52
pignut hickory	<i>Carya glabra</i>	WDL	Medium	0.6	0.1	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	53
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0.1	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	54
Scots pine	<i>Pinus sylvestris</i>	NSH	FIA	0.2	0.0	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	55
ailanthus	<i>Ailanthus altissima</i>	NSL	FIA	0.3	0.0	2.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	56
butternut	<i>Juglans cinerea</i>	NSLX	FIA	0.3	0.0	0.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	57
jack pine	<i>Pinus banksiana</i>	NSH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	58
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	59
red maple	<i>Acer rubrum</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	60
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	61
pawpaw	<i>Asimina triloba</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	62
gray birch	<i>Betula populifolia</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	63
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum</i> ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	65
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	66
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	67
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	68
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	69
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	70
blue ash	<i>Fraxinus quadrangulata</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	71
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	72
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	73
pin cherry	<i>Prunus pensylvanica</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	75
bluejack oak	<i>Quercus incana</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	77
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	78
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	79