

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
 4,246.0 1,639.4 39

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	12	19	Increase	23	20	Very Good	2	2	Likely	1	1
Hickory	4			Medium	24	34	No Change	5	9	Good	18	18	Infill	10	10
Maple	5	Abundant	0	Low	24	8	Decrease	15	14	Fair	7	6	Migrate	4	7
Oak	7	Common	13	FIA	2		New	15	15	Poor	7	7			
Pine	1	Rare	32				Unknown	4	4	Very Poor	5	6			
Other	25	Absent	16							FIA Only	1	1			
	45		61		62	61		62	62	Unknown	2	2			
											42	42			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	49.9	51.7	54.3	54.4	
	CCSM85	49.9	52.3	54.9	58.1	
	GFDL45	49.9	55.8	55.7	56.7	
	GFDL85	49.9	53.1	56.7	61.0	
	HAD45	49.9	52.9	56.5	58.1	
HAD85	49.9	53.2	57.8	62.8		
Growing Season May—Sep	CCSM45	66.9	68.7	70.9	71.4	
	CCSM85	66.9	69.3	71.8	75.7	
	GFDL45	66.9	74.2	73.9	75.3	
	GFDL85	66.9	70.9	75.1	80.1	
	HAD45	66.9	70.4	73.4	75.7	
HAD85	66.9	70.2	75.8	81.2		
Coldest Month Average	CCSM45	23.4	25.1	27.1	27.2	
	CCSM85	23.4	26.2	27.4	29.4	
	GFDL45	23.4	26.5	27.4	28.2	
	GFDL85	23.4	26.7	27.9	29.5	
	HAD45	23.4	24.7	28.0	28.1	
HAD85	23.4	26.2	28.9	31.8		
Warmest Month Average	CCSM45	72.8	74.7	76.1	76.6	
	CCSM85	72.8	75.6	77.3	79.4	
	GFDL45	72.8	75.7	77.8	78.7	
	GFDL85	72.8	76.7	78.9	81.9	
	HAD45	72.8	76.6	78.7	80.3	
HAD85	72.8	77.5	81.5	85.2		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	37.2	38.1	38.1	39.6	
	CCSM85	37.2	38.8	39.3	40.0	
	GFDL45	37.2	40.8	44.1	45.2	
	GFDL85	37.2	39.4	44.8	46.9	
	HAD45	37.2	37.8	38.7	38.8	
HAD85	37.2	39.1	36.3	39.7		
Growing Season May—Sep	CCSM45	18.1	18.4	17.9	18.2	
	CCSM85	18.1	17.8	18.0	17.1	
	GFDL45	18.1	19.8	20.6	21.4	
	GFDL85	18.1	19.1	20.5	20.7	
	HAD45	18.1	18.4	16.7	17.6	
HAD85	18.1	17.9	14.5	15.4		

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	54.9	456.2	12.1	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	1
green ash	Fraxinus pennsylvanica	WSH	Low	68.2	162.4	7.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	2
white ash	Fraxinus americana	WDL	Medium	47.9	152.0	5.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	3
American elm	Ulmus americana	WDH	Medium	67.9	138.6	5.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	4
silver maple	Acer saccharinum	NSH	Low	30	120.1	6.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	5
black cherry	Prunus serotina	WDL	Medium	69.6	103.4	7.3	Sm. inc.	No change	Low	Common	Fair	Poor			1	6
pin oak	Quercus palustris	NSH	Low	43.6	97.2	5.8	No change	No change	Low	Common	Poor	Poor			0	7
eastern cottonwood	Populus deltoides	NSH	Low	50.8	91.1	6.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
shagbark hickory	Carya ovata	WSL	Medium	57.8	86.4	5.4	Sm. inc.	No change	Medium	Common	Good	Fair			1	9
American basswood	Tilia americana	WSL	Medium	58.9	78.2	5.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
swamp white oak	Quercus bicolor	NSL	Low	19.9	77.1	6.7	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
sugar maple	Acer saccharum	WDH	High	50.3	76.5	7.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
northern red oak	Quercus rubra	WDH	Medium	40.1	57.1	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
black willow	Salix nigra	NSH	Low	22	40.7	7.0	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor			0	14
black locust	Robinia pseudoacacia	NDH	Low	10.8	40.4	9.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	15
American beech	Fagus grandifolia	WDH	High	22.8	38.0	2.1	No change	Lg. dec.	Medium	Rare	Poor	Very Poor	Infill +		1	16
bitternut hickory	Carya cordiformis	WSL	Low	55.5	34.2	4.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	17
yellow-poplar	Liriodendron tulipifera	WDH	High	26.5	27.1	2.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	18
black walnut	Juglans nigra	WDH	Low	45.5	26.9	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	19
Osage-orange	Maclura pomifera	NDH	Medium	3.1	26.9	3.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	20
slippery elm	Ulmus rubra	WSL	Low	28.4	23.7	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	21
eastern redcedar	Juniperus virginiana	WDH	Medium	1.6	22.5	6.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	22
sycamore	Platanus occidentalis	NSL	Low	16.6	21.7	6.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	23
boxelder	Acer negundo	WSH	Low	29.5	20.6	4.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	12.7	13.4	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
sassafras	Sassafras albidum	WSL	Low	21.9	12.0	3.5	Lg. inc.	No change	Medium	Rare	Good	Poor			1	26
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	39.7	11.7	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	27
eastern white pine	Pinus strobus	WDH	High	2.4	11.2	4.8	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	28
blackgum	Nyssa sylvatica	WDL	Medium	5.7	11.0	1.2	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	1	29
black oak	Quercus velutina	WDH	High	9.4	10.7	18.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	30
pignut hickory	Carya glabra	WDL	Medium	26.5	7.4	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++		1	31
flowering dogwood	Cornus florida	WDL	Medium	24.6	5.8	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
white mulberry	Morus alba	NSL	FIA	6.5	5.4	6.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	33
black maple	Acer nigrum	NSH	Low	6.5	5.2	6.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
black ash	Fraxinus nigra	WSH	Medium	18	3.3	1.0	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	35
chokecherry	Prunus virginiana	NSLX	FIA	6.5	2.5	3.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	36
mockernut hickory	Carya alba	WDL	Medium	13.5	2.4	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	37
pin cherry	Prunus pensylvanica	NSL	Low	2.4	1.8	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	38
white oak	Quercus alba	WDH	Medium	5.1	1.7	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	39
sweetgum	Liquidambar styraciflua	WDH	High	0.7	1.6	0.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	40
cucumbertree	Magnolia acuminata	NSL	Low	0.7	1.6	0.2	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	41
scarlet oak	Quercus coccinea	WDL	Medium	11.3	1.3	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	42
bigtooth aspen	Populus grandidentata	NSL	Medium	8.4	1.2	1.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
bur oak	Quercus macrocarpa	NDH	Medium	8.4	1.1	1.6	No change	No change	High	Rare	Fair	Fair		Infill +	2	44
hackberry	Celtis occidentalis	WDH	Medium	9.4	0.7	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	45
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	46
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	47



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pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			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
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	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	Migrate +	Migrate +	3	51
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	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
red mulberry	<i>Morus rubra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	54
shingle oak	<i>Quercus imbricaria</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	55
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	56
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	58
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	59
bluejack oak	<i>Quercus incana</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				60
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	61
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	62