

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 9,412.7 3,634.3 40

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			High	10	19	Increase	17	17	Very Good	1	1	Likely	0	0
Hickory	6			Medium	21	34	No Change	14	14	Good	11	11	Infill	27	27
Maple	3	Abundant	0	Low	27	7	Decrease	13	13	Fair	12	12	Migrate	4	7
Oak	8	Common	5	FIA	4		New	11	11	Poor	7	8			
Pine	2	Rare	43				Unknown	7	7	Very Poor	13	10			
Other	27	Absent	12							FIA Only	2	2			
	48		60		62	60		62	62	Unknown	3	3			
											49	47			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	51.6	53.6	55.8	56.1	
Average	CCSM85	51.6	54.3	56.8	59.5	
	GFDL45	51.6	57.8	57.0	58.0	
	GFDL85	51.6	54.6	58.0	62.1	
	HAD45	51.6	54.4	57.8	59.6	
	HAD85	51.6	54.8	59.5	63.9	
Growing Season	CCSM45	69.7	72.0	73.8	74.6	
	CCSM85	69.7	72.9	75.2	78.3	
May—Sep	GFDL45	69.7	77.2	76.0	77.5	
	GFDL85	69.7	73.3	77.2	82.3	
	HAD45	69.7	72.7	75.5	77.8	
	HAD85	69.7	73.0	78.5	82.9	
Coldest Month	CCSM45	22.3	23.8	25.9	26.1	
Average	CCSM85	22.3	25.3	26.7	28.2	
	GFDL45	22.3	26.7	27.4	28.1	
	GFDL85	22.3	25.9	27.4	28.6	
	HAD45	22.3	23.8	27.1	27.2	
	HAD85	22.3	25.9	29.0	31.3	
Warmest Month	CCSM45	75.6	77.7	79.1	79.9	
Average	CCSM85	75.6	79.3	81.0	82.5	
	GFDL45	75.6	78.7	80.4	81.5	
	GFDL85	75.6	79.6	81.4	84.5	
	HAD45	75.6	78.8	81.0	81.9	
	HAD85	75.6	80.3	83.7	86.3	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	37.3	35.8	37.0	36.4	
Total	CCSM85	37.3	36.5	37.0	37.5	
	GFDL45	37.3	40.8	43.9	44.9	
	GFDL85	37.3	40.9	46.3	46.6	
	HAD45	37.3	39.2	41.1	40.7	
	HAD85	37.3	40.4	38.8	42.1	
Growing Season	CCSM45	18.8	18.1	18.2	16.9	
	CCSM85	18.8	17.3	17.2	16.6	
May—Sep	GFDL45	18.8	19.9	20.8	21.3	
	GFDL85	18.8	20.1	21.6	20.9	
	HAD45	18.8	19.2	18.3	18.7	
	HAD85	18.8	19.2	16.6	16.8	

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
American elm	Ulmus americana	WDH	Medium	51.8	105.8	7.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	1
black cherry	Prunus serotina	WDL	Medium	49.1	71.1	5.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	2
black walnut	Juglans nigra	WDH	Low	42.4	65.2	6.3	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	3
white oak	Quercus alba	WDH	Medium	34.8	61.2	8.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	4
hackberry	Celtis occidentalis	WDH	Medium	44.7	60.6	6.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	5
sugar maple	Acer saccharum	WDH	High	16.5	43.4	9.7	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	6
black willow	Salix nigra	NSH	Low	20.6	38.2	17.4	Lg. dec.	No change	Low	Rare	Very Poor	Very Poor			0	7
white ash	Fraxinus americana	WDL	Medium	18.7	35.0	3.9	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	8
silver maple	Acer saccharinum	NSH	Low	11.1	34.9	13.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	9
red mulberry	Morus rubra	NSL	Low	12.7	31.4	7.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	10
northern red oak	Quercus rubra	WDH	Medium	19.7	29.3	9.0	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	11
black oak	Quercus velutina	WDH	High	19.1	29.1	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	12
Osage-orange	Maclura pomifera	NDH	Medium	22	28.7	6.4	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	13
shingle oak	Quercus imbricaria	NDH	Medium	12.1	27.7	4.7	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	14
bitternut hickory	Carya cordiformis	WDL	Low	18.4	25.7	5.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	15
eastern white pine	Pinus strobus	WDH	High	8.5	24.3	45.7	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	16
green ash	Fraxinus pennsylvanica	WSH	Low	21	23.1	3.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	17
honeylocust	Gleditsia triacanthos	NSH	Low	22.3	22.6	5.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	18
shagbark hickory	Carya ovata	WSL	Medium	23.7	21.8	3.5	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	19
black locust	Robinia pseudoacacia	NDH	Low	14.2	18.2	12.3	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good		Infill ++	1	20
sycamore	Platanus occidentalis	NSL	Low	9	18.1	6.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
Siberian elm	Ulmus pumila	NDH	FIA	4.2	16.3	61.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	22
bur oak	Quercus macrocarpa	NDH	Medium	7.1	16.0	4.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	23
slippery elm	Ulmus rubra	WSL	Low	22.2	14.7	2.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	24
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.3	14.3	3.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	25
white mulberry	Morus alba	NSL	FIA	15.3	13.5	6.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	26
northern catalpa	Catalpa speciosa	NSHX	FIA	8.5	12.4	23.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
eastern cottonwood	Populus deltoides	NSH	Low	9.8	11.6	7.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	28
mockernut hickory	Carya alba	WDL	Medium	6.1	11.3	4.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	29
pin oak	Quercus palustris	NSH	Low	4.3	9.1	1.7	No change	No change	Low	Rare	Very Poor	Very Poor			2	30
American basswood	Tilia americana	WSL	Medium	10.6	6.3	3.8	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	31
eastern redcedar	Juniperus virginiana	WDH	Medium	6	5.8	1.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	32
sassafras	Sassafras albidum	WSL	Low	10.5	4.9	1.5	Lg. inc.	Sm. inc.	Medium	Rare	Good	Fair	Infill ++	Infill +	2	33
red pine	Pinus resinosa	NSH	Medium	1.1	3.9	3.6	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	34
post oak	Quercus stellata	WDH	High	5.6	3.5	3.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	35
Ohio buckeye	Aesculus glabra	NSL	Low	10.5	2.9	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
chinkapin oak	Quercus muehlenbergii	NSL	Medium	17	2.3	2.2	No change	No change	Medium	Rare	Poor	Poor			0	37
pawpaw	Asimina triloba	NSL	Low	4.6	1.8	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
flowering dogwood	Cornus florida	WDL	Medium	0.8	1.5	1.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
eastern redbud	Cercis canadensis	NSL	Low	13.1	1.5	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	40
black hickory	Carya texana	NDL	High	5.8	1.3	1.4	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	41
pecan	Carya illinoensis	NSH	Low	0.9	0.5	0.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	42
boxelder	Acer negundo	WSH	Low	0.2	0.3	0.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	43
bigtooth aspen	Populus grandidentata	NSL	Medium	4.2	0.3	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
shellbark hickory	Carya laciniosa	NSL	Low	4.2	0.2	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
sugarberry	Celtis laevigata	NDH	Medium	4.2	0.2	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	46
chokecherry	Prunus virginiana	NSLX	FIA	0.5	0.2	0.1	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	
serviceberry	Amelanchier spp.	NSL	Low	4.2	0.1	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	48
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	49
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	50
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	51
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	52
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	53
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	54
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	55
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	56
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	57
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +			3	58
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	59
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	60
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	61
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3	62