

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
 9,549.4 3,687.0 57

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	6	17	Increase	16	19	Very Good	0	0	Likely	2	2
Hickory	6			Medium	21	31	No Change	11	9	Good	14	17	Infill	26	28
Maple	3	Abundant	0	Low	26	6	Decrease	15	14	Fair	8	6	Migrate	2	6
Oak	10	Common	6	FIA	2		New	8	8	Poor	8	8			
Pine	0	Rare	38				Unknown	5	5	Very Poor	10	10			
Other	23	Absent	11							FIA Only	1	1			
	44		55		55	54		55	55	Unknown	3	3			
											44	45			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	53.2	55.1	57.0	57.6	
	CCSM85	53.2	55.9	58.3	61.2	
	GFDL45	53.2	59.3	58.4	59.5	
	GFDL85	53.2	56.1	59.2	63.3	
	HAD45	53.2	55.8	59.0	60.6	
	HAD85	53.2	56.2	61.1	64.8	
Growing Season (May—Sep)	CCSM45	71.1	73.4	74.9	75.8	
	CCSM85	71.1	74.3	76.7	80.1	
	GFDL45	71.1	78.9	77.3	79.1	
	GFDL85	71.1	74.7	78.3	83.5	
	HAD45	71.1	73.7	76.3	78.3	
	HAD85	71.1	74.2	79.8	83.3	
Coldest Month Average	CCSM45	24.8	26.6	28.4	28.8	
	CCSM85	24.8	27.6	28.7	30.4	
	GFDL45	24.8	28.7	29.3	29.5	
	GFDL85	24.8	27.5	29.0	30.2	
	HAD45	24.8	26.1	29.1	29.2	
	HAD85	24.8	28.5	31.3	33.5	
Warmest Month Average	CCSM45	77.6	80.0	81.2	81.9	
	CCSM85	77.6	81.5	83.0	84.6	
	GFDL45	77.6	81.1	82.8	84.1	
	GFDL85	77.6	81.6	83.1	86.9	
	HAD45	77.6	80.2	82.0	83.0	
	HAD85	77.6	81.9	85.0	86.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	41.0	39.4	42.4	39.8	
	CCSM85	41.0	40.2	41.4	40.8	
	GFDL45	41.0	44.3	45.4	44.9	
	GFDL85	41.0	44.4	49.9	48.9	
	HAD45	41.0	43.4	44.4	43.6	
	HAD85	41.0	43.0	41.3	44.4	
Growing Season (May—Sep)	CCSM45	23.6	22.7	24.1	21.7	
	CCSM85	23.6	22.8	23.2	22.0	
	GFDL45	23.6	25.4	24.3	24.5	
	GFDL85	23.6	25.4	27.3	25.9	
	HAD45	23.6	23.9	23.8	23.8	
	HAD85	23.6	23.7	21.3	21.8	

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-DGP30 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
Osage-orange	Maclura pomifera	NDH	Medium	64.9	197.8	11.5	Lg. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	1
black walnut	Juglans nigra	WDH	Low	69.6	163.0	11.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	2
American elm	Ulmus americana	WDH	Medium	84.6	144.9	8.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
hackberry	Celtis occidentalis	WDH	Medium	82.5	122.7	10.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	4
pin oak	Quercus palustris	NSH	Low	42.3	103.6	8.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	5
honeylocust	Gleditsia triacanthos	NSH	Low	59.2	78.3	9.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	6
post oak	Quercus stellata	WDH	High	13.5	46.1	12.6	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	7
silver maple	Acer saccharinum	NSH	Low	11	43.9	12.2	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	8
white oak	Quercus alba	WDH	Medium	25.2	39.6	14.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	9
sugar maple	Acer saccharum	WDH	High	8.9	39.6	13.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	10
white ash	Fraxinus americana	WDL	Medium	35.1	38.0	4.5	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	11
green ash	Fraxinus pennsylvanica	WSH	Low	37.6	33.3	5.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	25.4	33.2	7.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	13
shingle oak	Quercus imbricaria	NDH	Medium	39.5	26.3	4.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	14
shagbark hickory	Carya ovata	WSL	Medium	41.9	21.4	4.0	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	1	15
eastern cottonwood	Populus deltoides	NSH	Low	23.7	20.8	7.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	16
black cherry	Prunus serotina	WDL	Medium	53.1	20.7	3.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	17
bitternut hickory	Carya cordiformis	WSL	Low	48	20.1	4.4	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	18
red mulberry	Morus rubra	NSL	Low	57.3	16.4	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	19
boxelder	Acer negundo	WSH	Low	21.7	14.4	3.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	20
black oak	Quercus velutina	WDH	High	18.7	14.2	9.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	21
northern red oak	Quercus rubra	WDH	Medium	21.9	13.3	6.0	Lg. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	22
bur oak	Quercus macrocarpa	NDH	Medium	25.5	13.1	5.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	23
pecan	Carya illinoensis	NSH	Low	10.2	12.9	8.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	24
eastern redbud	Cercis canadensis	NSL	Low	9.6	10.6	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	25
chinkapin oak	Quercus muehlenbergii	NSL	Medium	26.5	9.0	4.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	26
shellbark hickory	Carya laciniosa	NSL	Low	5.2	8.7	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
American basswood	Tilia americana	WSL	Medium	5.2	8.6	7.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	28
black willow	Salix nigra	NSH	Low	12	7.3	9.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	29
black locust	Robinia pseudoacacia	NDH	Low	7.6	7.2	6.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
slippery elm	Ulmus rubra	WSL	Low	25.5	6.1	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	31
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	11.9	5.0	6.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15	4.8	4.0	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	33
sycamore	Platanus occidentalis	NSL	Low	16.9	4.6	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	34
swamp white oak	Quercus bicolor	NSL	Low	6.8	3.9	3.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
pignut hickory	Carya glabra	WDL	Medium	8.4	2.1	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
flowering dogwood	Cornus florida	WDL	Medium	13.5	1.4	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
Shumard oak	Quercus shumardii	NSL	Low	3.6	1.1	3.6	No change	Lg. inc.	High	Rare	Fair	Good			2	38
common persimmon	Diospyros virginiana	NSL	Low	8.3	1.0	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	39
pawpaw	Asimina triloba	NSL	Low	12	0.7	0.9	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	40
Ohio buckeye	Aesculus glabra	NSL	Low	5.6	0.7	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	41
white mulberry	Morus alba	NSL	FIA	4.1	0.4	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
black hickory	Carya texana	NDL	High	4.2	0.3	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
serviceberry	Amelanchier spp.	NSL	Low	3.1	0.3	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	45
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	46
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	47



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sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	48
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	49
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	50
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	51
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	52
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	54
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	55