

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 60

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	16	Increase	6	8	Very Good	1	2	Likely	2	2
Hickory	2			Medium	20	28	No Change	13	11	Good	3	4	Infill	22	24
Maple	3	Abundant	0	Low	24	7	Decrease	12	12	Fair	12	11	Migrate	6	9
Oak	6	Common	12	FIA	2		New	15	15	Poor	8	8			
Pine	0	Rare	21				Unknown	6	6	Very Poor	7	6			
Other	20	Absent	19							FIA Only	1	1			
	33		52		52	51		52	52	Unknown	4	4			
											36	36			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	54.1	55.9	58.0	58.5	
	CCSM85	54.1	56.6	59.0	61.6	
	GFDL45	54.1	59.9	59.1	60.3	
	GFDL85	54.1	56.9	60.0	64.2	
	HAD45	54.1	56.5	59.5	60.9	
	HAD85	54.1	57.0	61.7	65.2	
Growing Season (May—Sep)	CCSM45	72.0	74.3	76.2	77.0	
	CCSM85	72.0	75.1	77.6	80.5	
	GFDL45	72.0	79.6	78.2	80.2	
	GFDL85	72.0	75.7	79.2	84.5	
	HAD45	72.0	74.2	76.5	78.1	
	HAD85	72.0	74.9	80.1	83.2	
Coldest Month Average	CCSM45	25.8	27.2	28.8	29.4	
	CCSM85	25.8	28.1	29.2	30.8	
	GFDL45	25.8	29.5	30.0	30.2	
	GFDL85	25.8	28.2	29.6	30.9	
	HAD45	25.8	27.4	30.4	30.2	
	HAD85	25.8	29.7	32.6	34.7	
Warmest Month Average	CCSM45	78.7	81.3	82.6	83.4	
	CCSM85	78.7	82.7	84.2	85.8	
	GFDL45	78.7	82.5	83.9	85.5	
	GFDL85	78.7	82.9	84.3	88.4	
	HAD45	78.7	80.8	82.5	83.3	
	HAD85	78.7	82.6	85.4	87.1	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	36.9	36.4	37.8	35.7	
	CCSM85	36.9	37.1	37.1	37.4	
	GFDL45	36.9	41.0	42.3	41.0	
	GFDL85	36.9	41.0	46.2	44.1	
	HAD45	36.9	40.4	40.5	40.2	
	HAD85	36.9	38.7	36.9	40.4	
Growing Season (May—Sep)	CCSM45	22.6	21.8	22.6	20.8	
	CCSM85	22.6	22.1	21.7	21.5	
	GFDL45	22.6	25.4	24.8	24.0	
	GFDL85	22.6	25.4	27.7	25.5	
	HAD45	22.6	23.4	23.9	23.9	
	HAD85	22.6	22.8	20.6	21.1	

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	67	238.7	11.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	1
hackberry	Celtis occidentalis	WDH	Medium	60.1	215.0	11.4	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	2
eastern redcedar	Juniperus virginiana	WDH	Medium	41.3	212.4	8.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
black walnut	Juglans nigra	WDH	Low	58.6	212.3	11.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	4
honeylocust	Gleditsia triacanthos	NSH	Low	69.1	188.9	14.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	5
Osage-orange	Maclura pomifera	NDH	Medium	60.6	142.4	12.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	6
red mulberry	Morus rubra	NSL	Low	59.7	121.6	6.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	7
shagbark hickory	Carya ovata	WSL	Medium	27.3	99.7	7.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	8
eastern cottonwood	Populus deltoides	NSH	Low	9.7	80.6	13.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	9
chinkapin oak	Quercus muehlenbergii	NSL	Medium	18	74.0	6.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	10
northern red oak	Quercus rubra	WDH	Medium	16.7	61.2	6.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	11
green ash	Fraxinus pennsylvanica	WSH	Low	22.1	52.5	15.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	12
boxelder	Acer negundo	WSH	Low	9.7	48.5	6.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	13
black oak	Quercus velutina	WDH	High	8.4	43.6	7.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	14
bitternut hickory	Carya cordiformis	WSL	Low	17.6	43.5	3.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	15
eastern redbud	Cercis canadensis	NSL	Low	13.9	39.2	4.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	16
bur oak	Quercus macrocarpa	NDH	Medium	16.6	28.3	5.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	17
black cherry	Prunus serotina	WDL	Medium	15.1	25.1	3.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	18
silver maple	Acer saccharinum	NSH	Low	8.8	23.4	20.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
sycamore	Platanus occidentalis	NSL	Low	2.1	21.5	4.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	20
white ash	Fraxinus americana	WDL	Medium	13.2	21.3	5.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	21
slippery elm	Ulmus rubra	WSL	Low	28.1	20.7	2.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.4	17.8	3.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	23
black willow	Salix nigra	NSH	Low	5.1	13.1	20.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	24
pin oak	Quercus palustris	NSH	Low	1	13.1	12.5	No change	No change	Low	Rare	Very Poor	Very Poor			0	25
American basswood	Tilia americana	WSL	Medium	5.6	5.1	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	26
Siberian elm	Ulmus pumila	NDH	FIA	2	4.8	2.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	27
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	13.1	4.4	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	28
sugar maple	Acer saccharum	WDH	High	0.7	3.8	2.4	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	29
black locust	Robinia pseudoacacia	NDH	Low	3.3	3.3	0.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair		Infill +	2	30
white oak	Quercus alba	WDH	Medium	4.2	2.2	1.8	No change	No change	High	Rare	Fair	Fair		Infill +	2	31
serviceberry	Amelanchier spp.	NSL	Low	1	2.2	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	32
flowering dogwood	Cornus florida	WDL	Medium	0.3	1.5	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	33
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	34
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	35
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	36
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	37
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	38
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	39
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	40
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	41
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	42
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	43
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	44
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	45
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	47

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Northern Research Station
Landscape Change Research Group
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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	48
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	49
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	51
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	52