

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 9,941.4 3,838.4 166

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	23	Increase	RCP45	RCP85	Very Good	11	11	Likely	1	1	
Ash	3			Medium	27	43	No Change	10	9	Good	14	18	Infill	13	14
Hickory	7			Low	31	10	Decrease	15	13	Fair	15	14	Migrate	4	5
Maple	5	Abundant	3	FIA	6		New	13	13	Poor	5	4			
Oak	11	Common	23				Unknown	11	11	Very Poor	7	6			
Pine	2	Rare	35							FIA Only	3	3			
Other	33	Absent	16							Unknown	5	5			
	61		77		79	76		79	79		60	61		18	20

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	58.0	59.9	61.8	62.2	
Average	CCSM85	58.0	60.5	62.8	65.7	
	GFDL45	58.0	61.9	63.0	64.1	
	GFDL85	58.0	60.9	63.7	67.7	
	HAD45	58.0	60.4	63.3	64.7	
	HAD85	58.0	60.6	65.3	68.8	
Growing Season	CCSM45	73.5	75.6	77.2	77.9	
	CCSM85	73.5	76.5	78.7	82.3	
May—Sep	GFDL45	73.5	78.4	79.6	81.6	
	GFDL85	73.5	77.4	80.6	85.6	
	HAD45	73.5	76.2	78.7	80.2	
	HAD85	73.5	76.6	82.2	85.3	
Coldest Month	CCSM45	33.9	36.0	37.2	37.7	
	CCSM85	33.9	36.6	37.6	39.3	
Average	GFDL45	33.9	38.0	38.3	38.2	
	GFDL85	33.9	35.7	37.1	37.7	
	HAD45	33.9	34.8	37.3	37.3	
	HAD85	33.9	36.6	38.6	40.4	
Warmest Month	CCSM45	79.7	82.0	82.9	83.4	
	CCSM85	79.7	83.1	84.0	85.8	
Average	GFDL45	79.7	84.6	85.8	87.3	
	GFDL85	79.7	84.3	85.9	89.8	
	HAD45	79.7	82.6	84.3	85.0	
	HAD85	79.7	83.8	86.8	88.1	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	45.8	43.7	46.3	45.4	
Total	CCSM85	45.8	44.6	46.4	46.6	
	GFDL45	45.8	49.2	51.8	48.9	
	GFDL85	45.8	49.1	56.1	54.8	
	HAD45	45.8	46.1	48.5	49.7	
	HAD85	45.8	49.2	43.6	46.8	
Growing Season	CCSM45	21.8	19.5	20.1	20.0	
	CCSM85	21.8	20.6	19.3	20.0	
May—Sep	GFDL45	21.8	23.7	23.4	23.2	
	GFDL85	21.8	23.4	26.9	25.0	
	HAD45	21.8	21.4	22.0	22.3	
	HAD85	21.8	22.9	17.9	19.0	

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
black oak	Quercus velutina	WDH	High	80.1	1544.3	20.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
white oak	Quercus alba	WDH	Medium	65.6	1079.6	16.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
post oak	Quercus stellata	WDH	High	75.8	1022.3	12.6	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
blackjack oak	Quercus marilandica	NSL	Medium	57.2	333.1	6.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	4
northern red oak	Quercus rubra	WDH	Medium	57.2	299.7	6.0	No change	No change	High	Common	Good	Good			1	5
American elm	Ulmus americana	WDH	Medium	56.6	251.3	5.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
black hickory	Carya texana	NDL	High	53.6	226.6	4.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
mockernut hickory	Carya alba	WDL	Medium	63.4	203.7	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
sassafras	Sassafras albidum	WSL	Low	49.8	201.6	4.9	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
bitternut hickory	Carya cordiformis	WSL	Low	46.6	189.1	4.5	No change	No change	High	Common	Good	Good			1	10
black walnut	Juglans nigra	WDH	Low	46.4	187.6	4.5	No change	No change	Medium	Common	Fair	Fair			1	11
black cherry	Prunus serotina	WDL	Medium	44.1	147.3	3.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	12
winged elm	Ulmus alata	WDL	Medium	47.6	143.9	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
flowering dogwood	Cornus florida	WDL	Medium	55.1	142.2	3.1	No change	No change	Medium	Common	Fair	Fair			1	14
eastern redcedar	Juniperus virginiana	WDH	Medium	30.7	136.5	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
shortleaf pine	Pinus echinata	WDH	High	11.8	136.5	7.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	37.8	130.3	3.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
hackberry	Celtis occidentalis	WDH	Medium	29.5	109.3	3.8	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
slippery elm	Ulmus rubra	WSL	Low	52.4	103.9	2.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	19
chinkapin oak	Quercus muehlenbergii	NSL	Medium	34.3	97.3	2.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
sycamore	Platanus occidentalis	NSL	Low	24.2	88.7	5.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
red mulberry	Morus rubra	NSL	Low	40.9	87.4	2.6	No change	No change	Medium	Common	Fair	Fair			1	22
red maple	Acer rubrum	WDH	High	27.2	67.2	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	23
common persimmon	Diospyros virginiana	NSL	Low	16.3	61.6	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	24
silver maple	Acer saccharinum	NSH	Low	1.9	58.8	28.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	25
southern red oak	Quercus falcata	WDL	Medium	9.1	54.5	6.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	26
boxelder	Acer negundo	WSH	Low	14.1	46.0	3.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	27
florida maple	Acer barbatum	NSL	Low	8	44.2	8.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	1	28
white ash	Fraxinus americana	WDL	Medium	27.5	41.7	2.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	29
eastern redbud	Cercis canadensis	NSL	Low	18	38.9	1.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	30
pecan	Carya illinoensis	NSH	Low	7.2	32.0	10.4	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	31
green ash	Fraxinus pennsylvanica	WSH	Low	9.8	31.9	3.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	32
loblolly pine	Pinus taeda	WDH	High	1	31.5	31.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	33
Osage-orange	Maclura pomifera	NDH	Medium	9.1	24.5	8.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	34
honeylocust	Gleditsia triacanthos	NSH	Low	15.2	17.5	4.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	35
sweetgum	Liquidambar styraciflua	WDH	High	4.9	16.1	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	36
black locust	Robinia pseudoacacia	NDH	Low	7.2	14.7	1.4	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	1	37
sugar maple	Acer saccharum	WDH	High	6.6	14.6	2.0	No change	No change	High	Rare	Fair	Fair	Infill +		2	38
serviceberry	Amelanchier spp.	NSL	Low	11.4	12.7	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
pignut hickory	Carya glabra	WDL	Medium	8	12.0	3.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	40
sugarberry	Celtis laevigata	NDH	Medium	4.6	10.0	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	41
shagbark hickory	Carya ovata	WSL	Medium	3.7	9.5	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
Shumard oak	Quercus shumardii	NSL	Low	4.3	8.6	1.6	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	43
American basswood	Tilia americana	WSL	Medium	9.3	7.9	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
eastern cottonwood	Populus deltoides	NSH	Low	1	5.7	5.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	45
ailanthus	Ailanthus altissima	NSL	FIA	5.9	5.6	1.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	6.2	5.1	0.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	47

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USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
paulownia	Paulownia tomentosa	NSL	FIA	1	3.6	3.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	48
white mulberry	Morus alba	NSL	FIA	4.4	3.5	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
pin oak	Quercus palustris	NSH	Low	4.2	3.3	3.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
cedar elm	Ulmus crassifolia	NDH	Medium	0.9	2.5	2.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	51
wild plum	Prunus americana	NSLX	FIA	1	2.3	2.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	0.1	1.5	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	53
butternut	Juglans cinerea	NSLX	FIA	1	1.3	1.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	54
overcup oak	Quercus lyrata	NSL	Medium	1	1.2	1.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	55
pawpaw	Asimina triloba	NSL	Low	0.3	0.9	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	56
shellbark hickory	Carya laciniosa	NSL	Low	4.4	0.8	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	57
yellow-poplar	Liriodendron tulipifera	WDH	High	4	0.8	3.0	Very Lg. dec.	Lg. inc.	High	Rare	Lost	Good		Infill ++	2	58
blue ash	Fraxinus quadrangulata	NSL	Low	0.4	0.5	0.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	59
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0.9	0.4	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	60
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	3.4	0.1	0.4	Lg. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			0	61
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	62
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	63
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	64
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	65
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	68
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	69
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	70
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	71
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	74
swamp chestnut oak	Quercus michauxii	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	75
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	78
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	79