

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
 10,188 3,933.4 92

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	25	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	2					Increase	34	34	Very Good	6	6	Likely	2	2	
Hickory	8					No Change	10	11	Good	23	24	Infill	43	45	
Maple	5	Abundant	0	Medium	32	50	Decrease	19	18	Fair	12	11	Migrate	5	5
Oak	15	Common	21	Low	34	8	New	14	14	Poor	9	11			
Pine	1	Rare	43	FIA	1		Unknown	6	6	Very Poor	13	11			
Other	33	Absent	17							FIA Only	1	1			
	64		81		83	83		83	83	Unknown	5	5			
											69	69			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	62.0	63.6	65.7	66.0	
Average	CCSM85	62.0	64.1	66.6	69.3	
	GFDL45	62.0	66.8	66.7	67.6	
	GFDL85	62.0	64.8	67.8	71.3	
	HAD45	62.0	64.6	67.5	68.8	
	HAD85	62.0	64.9	69.4	73.1	
Growing Season	CCSM45	77.1	78.6	80.2	80.8	
	CCSM85	77.1	79.2	81.6	85.1	
May—Sep	GFDL45	77.1	83.0	82.5	84.2	
	GFDL85	77.1	80.4	83.9	88.3	
	HAD45	77.1	80.5	83.4	84.5	
	HAD85	77.1	80.7	87.2	90.6	
Coldest Month	CCSM45	39.1	41.2	42.5	42.7	
	CCSM85	39.1	41.7	42.8	44.3	
Average	GFDL45	39.1	42.7	42.9	43.0	
	GFDL85	39.1	40.5	41.8	42.3	
	HAD45	39.1	40.0	42.0	42.3	
	HAD85	39.1	41.1	42.8	44.4	
Warmest Month	CCSM45	82.2	83.4	84.4	84.6	
	CCSM85	82.2	84.4	85.3	87.1	
Average	GFDL45	82.2	86.6	87.0	88.1	
	GFDL85	82.2	85.9	87.5	90.3	
	HAD45	82.2	86.7	88.7	88.9	
	HAD85	82.2	87.5	91.7	92.8	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	52.9	54.5	59.4	57.6	
Total	CCSM85	52.9	55.5	58.3	60.4	
	GFDL45	52.9	58.7	63.3	62.7	
	GFDL85	52.9	58.7	62.5	65.1	
	HAD45	52.9	50.6	55.6	58.0	
	HAD85	52.9	55.2	48.7	54.0	
Growing Season	CCSM45	19.1	18.5	18.7	19.1	
	CCSM85	19.1	18.0	17.3	18.1	
May—Sep	GFDL45	19.1	21.2	22.9	22.8	
	GFDL85	19.1	22.6	24.0	24.4	
	HAD45	19.1	16.9	17.8	16.7	
	HAD85	19.1	18.6	13.7	14.1	

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
loblolly pine	Pinus taeda	WDH	High	16.3	328.7	21.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	1
sugarberry	Celtis laevigata	NDH	Medium	61.8	277.7	18.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	2
sweetgum	Liquidambar styraciflua	WDH	High	52.3	224.3	7.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	3
winged elm	Ulmus alata	WDL	Medium	34.4	200.9	7.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	4
green ash	Fraxinus pennsylvanica	WSH	Low	65.9	179.2	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	5
black willow	Salix nigra	NSH	Low	35.4	170.7	11.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	6
American elm	Ulmus americana	WDH	Medium	60.2	166.9	4.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	7
boxelder	Acer negundo	WSH	Low	30.3	141.3	8.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	8
water tupelo	Nyssa aquatica	NSH	Medium	19.9	132.5	21.2	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	9
southern red oak	Quercus falcata	WDL	Medium	12.2	123.9	9.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
sycamore	Platanus occidentalis	NSL	Low	23.6	118.1	10.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	11
white oak	Quercus alba	WDH	Medium	24	102.0	6.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	12
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	27	98.2	5.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	13
yellow-poplar	Liriodendron tulipifera	WDH	High	9.4	81.4	6.9	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	2	14
pignut hickory	Carya glabra	WDL	Medium	17.5	79.0	5.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	15
mockernut hickory	Carya alba	WDL	Medium	26.1	68.5	4.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
water oak	Quercus nigra	WDH	High	27.3	67.4	7.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
bald cypress	Taxodium distichum	NSH	Medium	32.3	60.6	10.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.8	55.2	4.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	19
pecan	Carya illinoensis	NSH	Low	29.8	55.1	7.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	20
willow oak	Quercus phellos	NSL	Low	29.1	53.8	7.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	21
eastern redcedar	Juniperus virginiana	WDH	Medium	18.8	48.5	4.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	22
black locust	Robinia pseudoacacia	NDH	Low	1.9	44.9	6.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	23
Shumard oak	Quercus shumardii	NSL	Low	11.3	43.3	6.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	24
nuttall oak	Quercus texana	NSH	Medium	40.1	41.7	8.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good			0	25
overcup oak	Quercus lyrata	NSL	Medium	30.1	41.3	7.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	26
eastern cottonwood	Populus deltoides	NSH	Low	26.1	39.7	7.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	27
slippery elm	Ulmus rubra	WSL	Low	50.2	39.6	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	28
post oak	Quercus stellata	WDH	High	11.9	39.5	5.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	29
black oak	Quercus velutina	WDH	High	14.5	35.5	4.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
black cherry	Prunus serotina	WDL	Medium	18.2	34.0	2.1	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	31
common persimmon	Diospyros virginiana	NSL	Low	42.6	33.5	3.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	32
water hickory	Carya aquatica	NSL	Medium	33.2	27.5	8.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	33
American beech	Fagus grandifolia	WDH	High	3.2	25.6	6.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
sassafras	Sassafras albidum	WSL	Low	32.6	22.2	1.8	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	35
water elm	Planera aquatica	NSL	Low	14.6	20.2	6.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	36
shagbark hickory	Carya ovata	WSL	Medium	15.5	19.1	2.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	37
pawpaw	Asimina triloba	NSL	Low	13.4	17.8	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
red maple	Acer rubrum	WDH	High	30.9	17.4	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	39
red mulberry	Morus rubra	NSL	Low	20.2	16.6	1.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	40
flowering dogwood	Cornus florida	WDL	Medium	13.8	14.7	4.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	41
silver maple	Acer saccharinum	NSH	Low	17.9	12.8	3.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	42
blackgum	Nyssa sylvatica	WDL	Medium	10.2	12.5	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	43
shellbark hickory	Carya laciniosa	NSL	Low	1	11.4	11.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	44
cucumbertree	Magnolia acuminata	NSL	Low	2	10.5	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
white ash	Fraxinus americana	WDL	Medium	11.8	10.5	1.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	46
florida maple	Acer barbatum	NSL	Low	10.6	10.4	3.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	47

One x One Degree
Climate Change Atlas Tree Species

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

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
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	5.6	9.6	1.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	48
honeylocust	<i>Gleditsia triacanthos</i>	NSH	Low	18.2	9.4	2.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	49
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	8.2	8.4	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	50
American hornbeam; muscle	<i>Carpinus caroliniana</i>	WSL	Low	5.7	7.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	51
swamp chestnut oak	<i>Quercus michauxii</i>	NSL	Low	20	7.2	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	52
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	5.7	6.3	2.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	53
black walnut	<i>Juglans nigra</i>	WDH	Low	2	5.9	3.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	54
northern red oak	<i>Quercus rubra</i>	WDH	Medium	5.1	4.9	1.9	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	55
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	4.9	3.7	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
sugar maple	<i>Acer saccharum</i>	WDH	High	1	2.4	2.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	57
hackberry	<i>Celtis occidentalis</i>	WDH	Medium	3.9	2.1	8.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	58
American basswood	<i>Tilia americana</i>	WSL	Medium	1	1.6	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	59
pin oak	<i>Quercus palustris</i>	NSH	Low	1	1.4	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	60
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum</i> ssp.	NSL	Low	3.1	0.7	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	61
waterlocust	<i>Gleditsia aquatica</i>	NSLX	FIA	7.6	0.4	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	62
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	1	0.3	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	63
black hickory	<i>Carya texana</i>	NDL	High	3.1	0.2	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	64
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	65
shortleaf pine	<i>Pinus echinata</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	66
slash pine	<i>Pinus elliotii</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
longleaf pine	<i>Pinus palustris</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	68
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	69
serviceberry	<i>Amelanchier</i> spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
river birch	<i>Betula nigra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
American holly	<i>Ilex opaca</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	73
southern magnolia	<i>Magnolia grandiflora</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	74
sweetbay	<i>Magnolia virginiana</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	77
redbay	<i>Persea borbonia</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	78
pin cherry	<i>Prunus pensylvanica</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	80
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	82
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	83