

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 10,306 3,979.1 309

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	16	25	Increase	30	39	Very Good	12	14	Likely	0	0
Hickory	8			Medium	33	54	No Change	15	10	Good	19	21	Infill	11	14
Maple	4	Abundant	3	Low	36	9	Decrease	27	23	Fair	8	11	Migrate	3	5
Oak	18	Common	29	FIA	3		New	12	12	Poor	18	13			
Pine	5	Rare	43				Unknown	4	4	Very Poor	14	11			
Other	38	Absent	13							FIA Only	3	3			
	75		88		88	88		88	88	Unknown	1	1		14	19
											75	74			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	62.4	64.1	66.2	66.4	
Average	62.4	64.5	67.0	69.6	
GFDL45	62.4	65.5	67.1	67.9	
GFDL85	62.4	65.0	68.2	71.5	
HAD45	62.4	64.9	67.8	69.1	
HAD85	62.4	65.2	69.5	73.3	
Growing Season	76.6	78.2	79.9	80.4	
May—Sep	76.6	78.5	81.1	84.4	
GFDL45	76.6	80.0	81.6	83.2	
GFDL85	76.6	79.4	83.0	87.0	
HAD45	76.6	80.1	82.8	84.0	
HAD85	76.6	80.2	86.5	89.8	
Coldest Month	41.1	43.4	44.3	44.3	
Average	41.1	43.9	45.2	46.4	
GFDL45	41.1	45.0	45.0	45.2	
GFDL85	41.1	43.0	44.1	44.5	
HAD45	41.1	41.3	43.2	43.8	
HAD85	41.1	42.6	44.0	45.6	
Warmest Month	81.3	82.8	83.5	83.7	
Average	81.3	83.1	84.3	86.2	
GFDL45	81.3	85.0	85.6	86.5	
GFDL85	81.3	84.1	85.8	88.0	
HAD45	81.3	85.9	87.9	88.2	
HAD85	81.3	86.4	90.6	91.6	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	55.3	57.9	63.3	60.9	
Total	55.3	58.3	59.2	65.1	
GFDL45	55.3	62.6	66.4	67.9	
GFDL85	55.3	62.8	65.5	68.4	
HAD45	55.3	53.1	59.5	59.7	
HAD85	55.3	57.3	51.5	55.8	
Growing Season	21.0	21.0	21.6	21.8	
May—Sep	21.0	19.6	19.7	21.1	
GFDL45	21.0	25.1	26.4	26.4	
GFDL85	21.0	26.2	27.9	28.9	
HAD45	21.0	19.3	21.7	19.7	
HAD85	21.0	21.2	15.8	16.9	

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	83.5	3601.8	30.0	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	87	1106.4	9.1	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
water oak	Quercus nigra	WDH	High	79.5	553.4	5.0	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
eastern redcedar	Juniperus virginiana	WDH	Medium	48.8	441.1	7.7	Sm. dec.	No change	Medium	Common	Poor	Fair			1	4
southern red oak	Quercus falcata	WDL	Medium	55.4	370.5	3.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	5
red maple	Acer rubrum	WDH	High	73.4	339.5	3.3	No change	Sm. inc.	High	Common	Good	Very Good			1	6
white oak	Quercus alba	WDH	Medium	53.3	298.8	3.9	No change	Sm. inc.	High	Common	Good	Very Good			1	7
yellow-poplar	Liriodendron tulipifera	WDH	High	47.3	287.8	3.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	56.1	282.3	4.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	9
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	44.8	261.0	4.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
blackgum	Nyssa sylvatica	WDL	Medium	57.1	239.0	2.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
sugarberry	Celtis laevigata	NDH	Medium	32.5	207.2	7.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
post oak	Quercus stellata	WDH	High	46.8	200.9	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
shortleaf pine	Pinus echinata	WDH	High	30.2	174.7	3.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
winged elm	Ulmus alata	WDL	Medium	62.6	165.5	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
willow oak	Quercus phellos	NSL	Low	28.3	147.0	4.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
overcup oak	Quercus lyrata	NSL	Medium	20.2	145.7	7.3	No change	Sm. inc.	Low	Common	Poor	Fair			1	17
mockernut hickory	Carya alba	WDL	Medium	55.1	137.8	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
shagbark hickory	Carya ovata	WSL	Medium	39.8	131.1	3.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	19
pignut hickory	Carya glabra	WDL	Medium	56.2	128.7	1.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	20
Osage-orange	Maclura pomifera	NDH	Medium	23.8	119.7	6.3	No change	No change	High	Common	Good	Good			1	21
black willow	Salix nigra	NSH	Low	19.7	113.4	5.0	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	22
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	26.6	89.7	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
water tupelo	Nyssa aquatica	NSH	Medium	10.2	88.7	7.2	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor	Infill +		0	24
swamp tupelo	Nyssa biflora	NDH	Medium	8	86.4	9.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	25
black cherry	Prunus serotina	WDL	Medium	42.9	78.6	1.2	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	26
flowering dogwood	Cornus florida	WDL	Medium	42.6	74.6	1.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	27
nuttall oak	Quercus texana	NSH	Medium	11.4	72.5	7.7	Lg. dec.	Sm. dec.	High	Common	Fair	Fair			0	28
sourwood	Oxydendrum arboreum	NDL	High	24.6	72.3	1.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	29
Shumard oak	Quercus shumardii	NSL	Low	15.8	61.7	2.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	30
sweetbay	Magnolia virginiana	NSL	Medium	12.1	55.3	2.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	31
black oak	Quercus velutina	WDH	High	19.6	52.9	1.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	32
common persimmon	Diospyros virginiana	NSL	Low	38.2	48.9	0.9	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			1	33
bald cypress	Taxodium distichum	NSH	Medium	4.4	47.0	9.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
American elm	Ulmus americana	WDH	Medium	19.6	44.2	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
sycamore	Platanus occidentalis	NSL	Low	16.2	41.5	2.7	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	36
American beech	Fagus grandifolia	WDH	High	17.9	39.5	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
laurel oak	Quercus laurifolia	NDH	Medium	12.7	37.9	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	38
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	18.4	35.2	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	39
northern red oak	Quercus rubra	WDH	Medium	17.8	34.3	1.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	40
eastern redbud	Cercis canadensis	NSL	Low	9.2	33.7	2.5	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
pecan	Carya illinoensis	NSH	Low	8.8	30.8	3.1	No change	Sm. inc.	Low	Rare	Very Poor	Poor	Infill +		1	42
river birch	Betula nigra	NSL	Low	8.4	22.4	1.4	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	43
blackjack oak	Quercus marilandica	NSL	Medium	4.3	21.8	4.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	44
slippery elm	Ulmus rubra	WSL	Low	20.3	20.4	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	45
swamp chestnut oak	Quercus michauxii	NSL	Low	9.6	20.2	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	46
scarlet oak	Quercus coccinea	WDL	Medium	11.3	19.4	1.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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

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sassafras	Sassafras albidum	WSL	Low	13.9	19.0	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				1 48
eastern cottonwood	Populus deltoides	NSH	Low	4.1	18.5	3.6	No change	No change	Medium	Rare	Poor	Poor		Infill +		2 49
boxelder	Acer negundo	WSH	Low	11.6	17.6	2.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		1 50
slash pine	Pinus elliottii	NDH	High	1	16.2	16.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 51
white ash	Fraxinus americana	WDL	Medium	7.8	13.4	1.3	No change	No change	Low	Rare	Very Poor	Very Poor				0 52
American holly	Ilex opaca	NSL	Medium	9.5	12.9	0.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +		1 53
shellbark hickory	Carya laciniosa	NSL	Low	10.9	11.9	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 54
hackberry	Celtis occidentalis	WDH	Medium	0.3	11.6	3.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 55
florida maple	Acer barbatum	NSL	Low	5.7	11.4	1.9	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +		1 56
honeylocust	Gleditsia triacanthos	NSH	Low	4.5	10.0	1.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 57
bitternut hickory	Carya cordiformis	WSL	Low	10	9.9	1.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 58
black walnut	Juglans nigra	WDH	Low	2.9	9.8	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 59
water hickory	Carya aquatica	NSL	Medium	2.2	8.7	2.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +		2 60
red mulberry	Morus rubra	NSL	Low	10.2	6.4	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 61
durand oak	Quercus sinuata var. sinuata	NSL	FIA	2.9	6.0	2.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 62
waterlocust	Gleditsia aquatica	NSLX	FIA	1	5.2	5.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 63
silver maple	Acer saccharinum	NSH	Low	0.8	4.4	3.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 64
black hickory	Carya texana	NDL	High	1.3	4.1	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 65
bigleaf magnolia	Magnolia macrophylla	NSL	Low	1.9	3.4	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 66
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.9	3.2	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 67
chestnut oak	Quercus prinus	NDH	High	0.9	3.1	0.7	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost				0 68
black locust	Robinia pseudoacacia	NDH	Low	1.1	2.5	0.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 69
water elm	Planera aquatica	NSL	Low	1.9	1.7	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 70
longleaf pine	Pinus palustris	NSH	Medium	1.8	1.0	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 71
serviceberry	Amelanchier spp.	NSL	Low	2.3	0.8	0.2	No change	No change	Medium	Rare	Poor	Poor				0 72
wild plum	Prunus americana	NSLX	FIA	1	0.7	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 73
Virginia pine	Pinus virginiana	NDH	High	1	0.5	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 74
pawpaw	Asimina triloba	NSL	Low	1	0.4	0.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 75
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 76
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 77
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 78
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 79
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 80
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 81
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 82
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 83
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 84
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 85
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 86
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 87
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 88