

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 3,979.1 386

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	20	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	2					Increase	32	37	Very Good	13	17	Likely	4	4	
Hickory	6					No Change	11	8	Good	16	16	Infill	13	12	
Maple	4	Abundant	3	Medium	32	47	Decrease	14	12	Fair	10	7	Migrate	2	3
Oak	14	Common	23	Low	31	9	New	13	14	Poor	9	8			
Pine	2	Rare	32	FIA	1		Unknown	6	5	Very Poor	7	6			
Other	30	Absent	17							FIA Only	1	1			
	58		75		76	76		76	76	Unknown	5	4			
											61	59			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	62.6	64.3	66.2	66.5	
Average	CCSM85	62.6	64.7	67.1	69.7	
	GFDL45	62.6	65.5	67.0	68.1	
	GFDL85	62.6	65.4	68.3	71.8	
	HAD45	62.6	65.0	68.0	69.1	
	HAD85	62.6	65.3	69.8	73.5	
Growing Season	CCSM45	76.8	78.5	80.1	80.6	
	CCSM85	76.8	78.9	81.2	84.6	
May—Sep	GFDL45	76.8	80.4	81.8	83.9	
	GFDL85	76.8	80.4	83.6	88.0	
	HAD45	76.8	80.0	82.9	83.6	
	HAD85	76.8	80.3	86.3	89.6	
Coldest Month	CCSM45	41.5	43.9	45.0	45.0	
Average	CCSM85	41.5	44.2	45.4	46.7	
	GFDL45	41.5	45.2	45.4	45.4	
	GFDL85	41.5	42.7	43.9	44.5	
	HAD45	41.5	42.5	44.3	44.9	
	HAD85	41.5	43.5	45.2	47.0	
Warmest Month	CCSM45	82.1	83.6	84.3	84.4	
Average	CCSM85	82.1	84.0	84.8	86.6	
	GFDL45	82.1	86.6	86.7	88.2	
	GFDL85	82.1	86.1	87.6	90.7	
	HAD45	82.1	86.2	87.8	88.0	
	HAD85	82.1	86.9	90.4	91.4	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	54.2	54.7	59.9	58.0	
Total	CCSM85	54.2	56.5	59.7	61.9	
	GFDL45	54.2	58.3	65.6	60.8	
	GFDL85	54.2	57.8	61.7	62.9	
	HAD45	54.2	53.1	55.8	59.3	
	HAD85	54.2	57.2	50.2	54.7	
Growing Season	CCSM45	19.7	19.8	20.1	19.7	
May—Sep	CCSM85	19.7	19.0	18.4	19.4	
	GFDL45	19.7	21.5	24.9	22.6	
	GFDL85	19.7	22.1	23.7	23.7	
	HAD45	19.7	18.6	18.7	18.2	
	HAD85	19.7	19.7	14.6	14.8	

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-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	95.7	5532.3	42.2	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
sweetgum	Liquidambar styraciflua	WDH	High	97.3	1476.3	11.0	No change	No change	Medium	Abundant	Good	Good			1	2
water oak	Quercus nigra	WDH	High	78.5	525.8	4.9	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	3
willow oak	Quercus phellos	NSL	Low	58.1	409.0	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	67	321.5	3.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	5
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	67.7	312.4	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
southern red oak	Quercus falcata	WDL	Medium	71.3	299.1	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	7
red maple	Acer rubrum	WDH	High	77.3	269.3	2.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
blackgum	Nyssa sylvatica	WDL	Medium	76.7	255.4	2.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	59.8	254.2	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
overcup oak	Quercus lyrata	NSL	Medium	20.4	234.6	6.5	No change	No change	Low	Common	Poor	Poor			0	11
winged elm	Ulmus alata	WDL	Medium	74.8	219.2	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
American holly	Ilex opaca	NSL	Medium	61.2	184.6	2.1	No change	No change	Medium	Common	Fair	Fair			1	13
shortleaf pine	Pinus echinata	WDH	High	37.5	174.0	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
post oak	Quercus stellata	WDH	High	42.5	134.2	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
bald cypress	Taxodium distichum	NSH	Medium	13.6	103.4	5.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	46.2	100.1	1.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	38	94.6	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	18
American beech	Fagus grandifolia	WDH	High	24.3	75.0	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
black hickory	Carya texana	NDL	High	34.3	73.0	1.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	20
mockernut hickory	Carya alba	WDL	Medium	35.1	71.1	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
water hickory	Carya aquatica	NSL	Medium	7.6	66.9	5.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	22
common persimmon	Diospyros virginiana	NSL	Low	34.2	65.2	1.4	Sm. dec.	Sm. inc.	High	Common	Fair	Very Good			1	23
swamp chestnut oak	Quercus michauxii	NSL	Low	23.8	63.6	2.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	24
flowering dogwood	Cornus florida	WDL	Medium	37.6	62.5	1.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	25
sassafras	Sassafras albidum	WSL	Low	23.1	60.3	1.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
nuttall oak	Quercus texana	NSH	Medium	5.2	47.1	5.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	27
black cherry	Prunus serotina	WDL	Medium	27	44.0	1.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	28
sweetbay	Magnolia virginiana	NSL	Medium	12.7	43.9	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	29
water elm	Planera aquatica	NSL	Low	7.1	30.3	3.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	30
pignut hickory	Carya glabra	WDL	Medium	10.6	22.9	1.6	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
white ash	Fraxinus americana	WDL	Medium	11.8	22.8	1.2	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor			0	32
sugarberry	Celtis laevigata	NDH	Medium	9.1	22.7	2.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
slippery elm	Ulmus rubra	WSL	Low	9.6	18.0	1.2	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	34
eastern redcedar	Juniperus virginiana	WDH	Medium	10.6	17.2	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	35
laurel oak	Quercus laurifolia	NDH	Medium	6.2	16.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	36
American elm	Ulmus americana	WDH	Medium	9.6	16.0	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
shagbark hickory	Carya ovata	WSL	Medium	7.3	16.0	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
eastern redbud	Cercis canadensis	NSL	Low	3	12.1	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	39
black willow	Salix nigra	NSH	Low	6.3	11.2	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	40
black oak	Quercus velutina	WDH	High	5.3	8.8	0.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
sycamore	Platanus occidentalis	NSL	Low	2.2	6.3	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	42
red mulberry	Morus rubra	NSL	Low	4.8	4.6	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
water tupelo	Nyssa aquatica	NSH	Medium	1.6	4.3	2.0	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	44
blackjack oak	Quercus marilandica	NSL	Medium	2.2	4.3	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	45
northern red oak	Quercus rubra	WDH	Medium	2.4	4.1	0.6	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	46
bitternut hickory	Carya cordiformis	WSL	Low	3.4	3.8	0.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	2	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		
florida maple	Acer barbatum	NSL	Low	1.9	2.9	1.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0	48	
honeylocust	Gleditsia triacanthos	NSH	Low	2.4	2.5	0.7	No change	Lg. inc.	High	Rare	Fair	Good	Infill +				2	49
American basswood	Tilia americana	WSL	Medium	2.9	2.0	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost					0	50
boxelder	Acer negundo	WSH	Low	2.2	1.4	0.4	No change	Lg. inc.	High	Rare	Fair	Good	Infill +				2	51
cedar elm	Ulmus crassifolia	NDH	Medium	0.8	1.1	0.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +			2	52
river birch	Betula nigra	NSL	Low	1.9	1.1	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good					2	53
silver maple	Acer saccharinum	NSH	Low	1	0.7	0.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost					0	54
pawpaw	Asimina triloba	NSL	Low	0.5	0.5	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor					0	55
Shumard oak	Quercus shumardii	NSL	Low	0.4	0.4	0.2	No change	Sm. inc.	High	Rare	Fair	Good					2	56
southern magnolia	Magnolia grandiflora	NSL	Low	0.8	0.3	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good					2	57
wild plum	Prunus americana	NSLX	FIA	0.9	0.2	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only					0	58
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	59
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +			3	60
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +			3	61
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	62
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++			3	64
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +			3	65
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	66
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown					0	67
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat					3	68
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat					3	69
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	70
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					3	71
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +			3	72
redbay	Persea borbonia	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat					3	73
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +			3	74
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	75
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate ++		3	76