

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 10,188 3,933.4 148

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	21	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85				
Ash	2					Increase	30	31	Very Good	9	10	Likely	1	1	
Hickory	7			Medium	32	47	No Change	14	14	Good	17	20	Infill	27	28
Maple	4	Abundant	0	Low	29	8	Decrease	14	13	Fair	10	7	Migrate	4	4
Oak	14	Common	28	FIA	2		New	12	12	Poor	14	14			
Pine	2	Rare	32				Unknown	6	6	Very Poor	8	7			
Other	31	Absent	14							FIA Only	2	2			
	60		74		76	76		76	76	Unknown	4	4			
											64	64			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	62.2	63.9	65.9	66.2	
Average	CCSM85	62.2	64.3	66.7	69.4	
	GFDL45	62.2	66.5	66.9	67.9	
	GFDL85	62.2	65.1	68.0	71.6	
	HAD45	62.2	64.8	67.7	69.0	
	HAD85	62.2	65.1	69.6	73.3	
Growing Season	CCSM45	77.2	78.7	80.3	80.9	
	CCSM85	77.2	79.3	81.6	85.1	
May—Sep	GFDL45	77.2	82.5	82.6	84.4	
	GFDL85	77.2	80.7	84.1	88.6	
	HAD45	77.2	80.5	83.3	84.4	
	HAD85	77.2	80.7	87.1	90.4	
Coldest Month	CCSM45	39.5	41.7	42.9	43.1	
	CCSM85	39.5	41.9	43.0	44.5	
Average	GFDL45	39.5	43.3	43.5	43.6	
	GFDL85	39.5	40.8	42.1	42.7	
	HAD45	39.5	40.6	42.4	42.8	
	HAD85	39.5	41.7	43.3	45.0	
Warmest Month	CCSM45	82.4	83.9	84.9	85.0	
	CCSM85	82.4	84.7	85.5	87.4	
Average	GFDL45	82.4	87.1	87.5	88.7	
	GFDL85	82.4	86.5	88.1	91.1	
	HAD45	82.4	86.7	88.6	88.9	
	HAD85	82.4	87.6	91.5	92.6	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	49.5	50.3	54.5	53.2	
Total	CCSM85	49.5	51.8	54.7	56.4	
	GFDL45	49.5	54.3	59.3	56.9	
	GFDL85	49.5	54.2	58.2	60.1	
	HAD45	49.5	47.9	52.1	55.0	
	HAD85	49.5	52.7	46.2	51.5	
Growing Season	CCSM45	16.9	16.3	16.6	16.8	
	CCSM85	16.9	16.0	15.3	16.0	
May—Sep	GFDL45	16.9	18.5	20.0	19.8	
	GFDL85	16.9	19.6	21.0	21.1	
	HAD45	16.9	15.4	15.9	15.1	
	HAD85	16.9	16.6	12.0	12.3	

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
sweetgum	Liquidambar styraciflua	WDH	High	38.1	466.1	10.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	1
loblolly pine	Pinus taeda	WDH	High	19.2	434.1	18.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	2
sugarberry	Celtis laevigata	NDH	Medium	41.9	427.2	9.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	3
overcup oak	Quercus lyrata	NSL	Medium	46.2	304.7	10.8	No change	No change	Low	Common	Poor	Poor			0	4
green ash	Fraxinus pennsylvanica	WSH	Low	56.2	301.9	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
winged elm	Ulmus alata	WDL	Medium	49.1	245.2	6.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
willow oak	Quercus phellos	NSL	Low	39.1	213.8	6.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
water hickory	Carya aquatica	NSL	Medium	43.9	211.2	6.3	No change	No change	Medium	Common	Fair	Fair			1	8
post oak	Quercus stellata	WDH	High	31.1	198.4	7.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	9
boxelder	Acer negundo	WSH	Low	20.4	192.5	6.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	10
water oak	Quercus nigra	WDH	High	35.4	178.4	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
water tupelo	Nyssa aquatica	NSH	Medium	15.2	171.8	20.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	12
nuttall oak	Quercus texana	NSH	Medium	43.7	152.2	6.1	No change	No change	High	Common	Good	Good			0	13
mockernut hickory	Carya alba	WDL	Medium	40.1	151.6	4.8	No change	No change	High	Common	Good	Good			1	14
bald cypress	Taxodium distichum	NSH	Medium	21.3	151.1	6.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	15
slippery elm	Ulmus rubra	WSL	Low	53	150.8	4.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
white oak	Quercus alba	WDH	Medium	20.2	134.5	5.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	17
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	39	128.8	5.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
pecan	Carya illinoensis	NSH	Low	18.5	128.0	6.6	Sm. inc.	Lg. inc.	Low	Common	Fair	Good	Infill +	Infill ++	1	19
southern red oak	Quercus falcata	WDL	Medium	21.3	114.3	5.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
common persimmon	Diospyros virginiana	NSL	Low	50.3	108.2	3.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	21
American elm	Ulmus americana	WDH	Medium	35.7	101.3	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
red maple	Acer rubrum	WDH	High	27.1	95.5	4.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
shagbark hickory	Carya ovata	WSL	Medium	22.7	92.8	5.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	24
black hickory	Carya texana	NDL	High	17.4	90.8	4.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	25
black willow	Salix nigra	NSH	Low	29.1	84.6	8.7	Lg. inc.	Lg. inc.	Low	Common	Good	Good	Infill ++	Infill ++	1	26
water elm	Planera aquatica	NSL	Low	18.7	66.6	6.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	27
blackgum	Nyssa sylvatica	WDL	Medium	13.4	50.7	3.1	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	28
sycamore	Platanus occidentalis	NSL	Low	16	47.2	4.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	29
Shumard oak	Quercus shumardii	NSL	Low	10.5	46.5	9.5	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	30
honeylocust	Gleditsia triacanthos	NSH	Low	25.6	44.9	3.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	31
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	17.3	40.6	2.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	32
black oak	Quercus velutina	WDH	High	9.7	39.6	3.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
waterlocust	Gleditsia aquatica	NSLX	FIA	20	37.6	3.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
sassafras	Sassafras albidum	WSL	Low	7.2	33.0	6.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	35
black cherry	Prunus serotina	WDL	Medium	19.3	26.5	1.7	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor			1	36
swamp chestnut oak	Quercus michauxii	NSL	Low	13.6	20.5	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
eastern cottonwood	Populus deltoides	NSH	Low	9	19.5	2.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	38
hackberry	Celtis occidentalis	WDH	Medium	6.3	19.2	2.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	39
cedar elm	Ulmus crassifolia	NDH	Medium	12.6	19.0	4.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	40
shortleaf pine	Pinus echinata	WDH	High	0.4	15.7	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	41
silver maple	Acer saccharinum	NSH	Low	4.1	13.4	2.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	42
northern red oak	Quercus rubra	WDH	Medium	3.4	13.2	3.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	43
blackjack oak	Quercus marilandica	NSL	Medium	5.6	12.8	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	44
red mulberry	Morus rubra	NSL	Low	7.8	9.5	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	45
bitternut hickory	Carya cordiformis	WSL	Low	5	8.3	0.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	46
pignut hickory	Carya glabra	WDL	Medium	3.4	7.5	2.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	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	
black walnut	Juglans nigra	WDH	Low	2	7.3	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	48
white ash	Fraxinus americana	WDL	Medium	10.8	6.8	1.6	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +		2	49
eastern redcedar	Juniperus virginiana	WDH	Medium	7.4	6.5	2.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++		2	50
flowering dogwood	Cornus florida	WDL	Medium	14	6.1	0.9	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +		1	51
florida maple	Acer barbatum	NSL	Low	2	5.5	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0	52
pawpaw	Asimina triloba	NSL	Low	1.8	5.3	2.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	53
swamp tupelo	Nyssa biflora	NDH	Medium	1	5.1	5.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0	54
eastern redbud	Cercis canadensis	NSL	Low	7.5	3.5	0.8	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	55
river birch	Betula nigra	NSL	Low	0.3	2.0	0.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2	56
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	1	1.1	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2	57
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1	1.0	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2	58
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	1.0	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0	59
wild plum	Prunus americana	NSLX	FIA	1.4	0.4	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	60
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	61
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	62
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	63
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	64
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	65
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	66
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +			3	67
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3	68
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	69
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +			3	70
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	71
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	72
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	73
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	74
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	75
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	76