

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
 8,626.5 3,330.7 208

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	4			High	15	20	Increase	22	27	Very Good	5	7
Hickory	3			Medium	33	51	No Change	8	6	Good	15	16
Maple	4	Abundant	3	Low	32	10	Decrease	28	25	Fair	5	8
Oak	13	Common	16	FIA	5		New	12	13	Poor	17	13
Pine	3	Rare	44				Unknown	15	14	Very Poor	11	8
Other	36	Absent	18							FIA Only	3	3
	63		81		85	81		85	85	Unknown	10	9
											66	64

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.2	61.8	63.7	63.8	
	CCSM85	60.2	62.1	64.4	67.1	
	GFDL45	60.2	63.4	65.1	66.0	
	GFDL85	60.2	63.0	66.2	69.8	
	HAD45	60.2	62.0	64.7	65.9	
	HAD85	60.2	62.3	65.4	69.1	
Growing Season (May—Sep)	CCSM45	74.3	75.9	77.5	77.9	
	CCSM85	74.3	76.0	78.4	81.6	
	GFDL45	74.3	77.8	79.6	81.1	
	GFDL85	74.3	77.6	81.1	85.0	
	HAD45	74.3	76.4	78.7	80.1	
	HAD85	74.3	76.4	79.9	83.6	
Coldest Month (Average)	CCSM45	39.1	41.3	42.2	42.5	
	CCSM85	39.1	41.6	42.5	43.9	
	GFDL45	39.1	42.3	42.7	43.4	
	GFDL85	39.1	41.2	42.3	43.5	
	HAD45	39.1	39.8	41.6	42.0	
	HAD85	39.1	40.1	41.5	43.1	
Warmest Month (Average)	CCSM45	79.7	81.3	82.2	82.2	
	CCSM85	79.7	81.4	83.0	84.3	
	GFDL45	79.7	82.3	83.4	84.6	
	GFDL85	79.7	83.1	84.8	87.0	
	HAD45	79.7	81.9	83.3	83.9	
	HAD85	79.7	82.2	84.3	86.4	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	48.0	53.3	55.3	54.5	
	CCSM85	48.0	52.9	54.8	61.4	
	GFDL45	48.0	51.8	55.3	57.4	
	GFDL85	48.0	50.9	55.1	56.4	
	HAD45	48.0	52.7	52.4	50.0	
	HAD85	48.0	55.1	49.8	48.2	
Growing Season (May—Sep)	CCSM45	23.2	28.8	29.7	29.5	
	CCSM85	23.2	27.0	28.3	32.2	
	GFDL45	23.2	25.1	27.4	28.9	
	GFDL85	23.2	24.3	27.8	28.7	
	HAD45	23.2	26.4	24.8	22.6	
	HAD85	23.2	27.3	23.6	20.8	

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	90.8	3574.2	34.8	No change	No change	Medium	Abundant	Good	Good			1	1
red maple	Acer rubrum	WDH	High	89.7	1388.3	14.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
sweetgum	Liquidambar styraciflua	WDH	High	82.7	921.5	9.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	63.3	482.3	7.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	4
swamp tupelo	Nyssa biflora	NDH	Medium	53.6	464.6	7.9	No change	Sm. inc.	Low	Common	Poor	Fair			1	5
water oak	Quercus nigra	WDH	High	47.8	203.8	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
bald cypress	Taxodium distichum	NSH	Medium	29.9	194.3	5.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
water tupelo	Nyssa aquatica	NSH	Medium	11.9	189.2	12.1	Sm. dec.	No change	Low	Common	Poor	Poor			0	8
American holly	Ilex opaca	NSL	Medium	55.8	161.3	2.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	9
sweetbay	Magnolia virginiana	NSL	Medium	44	107.5	2.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
pond pine	Pinus serotina	NSH	Medium	8.6	106.5	9.8	No change	No change	Low	Common	Poor	Poor			0	11
American beech	Fagus grandifolia	WDH	High	31.3	102.9	3.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
green ash	Fraxinus pennsylvanica	WSH	Low	32.9	93.2	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	16.5	90.5	7.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	14
redbay	Persea borbonia	NSL	Low	26	82.2	2.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	15
sassafras	Sassafras albidum	WSL	Low	7.5	80.5	10.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	16
white oak	Quercus alba	WDH	Medium	29.8	68.6	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
American elm	Ulmus americana	WDH	Medium	27.2	57.0	1.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	18
black cherry	Prunus serotina	WDL	Medium	26.1	51.5	1.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	19
blackgum	Nyssa sylvatica	WDL	Medium	39.8	48.4	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	32	43.1	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	21
sourwood	Oxydendrum arboreum	NDL	High	27.5	40.8	1.6	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			1	22
willow oak	Quercus phellos	NSL	Low	16.9	37.7	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	23
southern red oak	Quercus falcata	WDL	Medium	22	33.8	1.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	24
swamp chestnut oak	Quercus michauxii	NSL	Low	16.6	30.6	2.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	25
laurel oak	Quercus laurifolia	NDH	Medium	15	26.5	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	26
hackberry	Celtis occidentalis	WDH	Medium	1	20.8	16.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	27
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	9.5	20.4	1.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	28
northern red oak	Quercus rubra	WDH	Medium	6.4	20.1	4.5	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	29
black oak	Quercus velutina	WDH	High	8.7	12.8	1.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	30
scarlet oak	Quercus coccinea	WDL	Medium	7.1	11.6	1.1	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			2	31
bitternut hickory	Carya cordiformis	WSL	Low	2.4	11.4	1.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	32
sycamore	Platanus occidentalis	NSL	Low	5.7	10.3	1.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	33
butternut	Juglans cinerea	NSLX	FIA	1.2	9.9	1.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	5.2	9.2	1.4	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	35
pignut hickory	Carya glabra	WDL	Medium	4.3	8.1	1.7	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	36
river birch	Betula nigra	NSL	Low	5.4	7.4	1.2	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	1	37
flowering dogwood	Cornus florida	WDL	Medium	14.7	7.2	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	38
post oak	Quercus stellata	WDH	High	2.3	6.5	2.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	39
white ash	Fraxinus americana	WDL	Medium	9.2	6.4	1.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	40
overcup oak	Quercus lyrata	NSL	Medium	6.8	6.1	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	41
eastern redcedar	Juniperus virginiana	WDH	Medium	6.3	5.6	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	42
mockernut hickory	Carya alba	WDL	Medium	12	5.6	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	43
slippery elm	Ulmus rubra	WSL	Low	9.9	5.5	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	44
pond cypress	Taxodium ascendens	NSH	Medium	3.3	5.3	1.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	45
ailanthus	Ailanthus altissima	NSL	FIA	3.4	4.5	1.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
black willow	Salix nigra	NSH	Low	3.3	4.3	1.2	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		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
Virginia pine	Pinus virginiana	NDH	High	3.1	4.3	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 48
eastern cottonwood	Populus deltoides	NSH	Low	3.7	3.2	0.6	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 49
common persimmon	Diospyros virginiana	NSL	Low	3	2.8	0.7	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor		Infill +		2 50
winged elm	Ulmus alata	WDL	Medium	1.2	2.7	0.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good		Infill ++		2 51
pumpkin ash	Fraxinus profunda	NSH	FIA	1.2	2.6	2.2	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 52
florida maple	Acer barbatum	NSL	Low	1.1	1.9	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 53
red mulberry	Morus rubra	NSL	Low	1.2	1.3	1.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 54
black locust	Robinia pseudoacacia	NDH	Low	1.1	1.1	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 55
pawpaw	Asimina triloba	NSL	Low	1.2	1.0	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost				0 56
serviceberry	Amelanchier spp.	NSL	Low	5.7	0.8	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 57
Carolina ash	Fraxinus caroliniana	NSL	FIA	4.6	0.6	2.0	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 58
white mulberry	Morus alba	NSL	FIA	1.1	0.4	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 59
sugar maple	Acer saccharum	WDH	High	1.1	0.4	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 60
swamp white oak	Quercus bicolor	NSL	Low	1.1	0.4	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 61
boxelder	Acer negundo	WSH	Low	1.2	0.3	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor				0 62
bigtooth aspen	Populus grandidentata	NSL	Medium	1.2	0.3	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 63
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 64
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 65
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 66
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 67
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 68
shagbark hickory	Carya ovata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 69
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 70
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 71
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 72
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +		3 73
loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +		3 74
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 75
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 76
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 77
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 78
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 79
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 80
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 81
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 82
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 83
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 84
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0 85