

	sq. km	sq. mi	FIA Plots
Area of Region	25,779	9,953.4	454

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	12	18	Increase	12	13	Very Good	3	5	Likely	2	3
Hickory	2			Medium	37	45	No Change	13	13	Good	11	9	Infill	13	15
Maple	2	Abundant	1	Low	27	13	Decrease	19	18	Fair	5	7	Migrate	1	5
Oak	9	Common	16	FIA	2		New	13	17	Poor	10	10		16	23
Pine	6	Rare	29				Unknown	21	17	Very Poor	13	11			
Other	23	Absent	30							FIA Only	2	2			
	46		76		78	76		78	78	Unknown	19	15			
											63	59			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	72.1	73.5	74.8	74.8	
Average	CCSM85	72.1	73.5	75.6	77.7	
	GFDL45	72.1	75.7	76.1	77.0	
	GFDL85	72.1	74.3	77.2	80.4	
	HAD45	72.1	73.5	75.6	76.7	
	HAD85	72.1	74.1	76.3	79.6	
Growing Season	CCSM45	80.1	81.2	82.4	82.6	
	CCSM85	80.1	81.3	83.4	85.7	
May—Sep	GFDL45	80.1	83.7	84.0	85.1	
	GFDL85	80.1	82.4	85.1	88.6	
	HAD45	80.1	82.1	83.7	84.9	
	HAD85	80.1	82.5	85.2	88.2	
Coldest Month	CCSM45	58.9	60.8	61.7	61.5	
Average	CCSM85	58.9	60.2	61.1	62.5	
	GFDL45	58.9	61.4	61.8	62.4	
	GFDL85	58.9	61.1	62.3	63.4	
	HAD45	58.9	58.9	60.1	60.6	
	HAD85	58.9	59.5	60.3	62.1	
Warmest Month	CCSM45	82.2	83.3	84.1	84.0	
Average	CCSM85	82.2	83.4	84.6	86.0	
	GFDL45	82.2	84.4	85.2	85.9	
	GFDL85	82.2	84.5	86.0	87.8	
	HAD45	82.2	84.3	85.0	85.6	
	HAD85	82.2	84.4	85.9	87.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	50.6	53.0	52.7	55.7	
Total	CCSM85	50.6	52.6	52.2	50.6	
	GFDL45	50.6	58.8	60.0	62.1	
	GFDL85	50.6	54.8	63.4	59.0	
	HAD45	50.6	50.6	49.7	50.9	
	HAD85	50.6	47.1	48.6	46.1	
Growing Season	CCSM45	30.8	32.6	31.2	33.6	
May—Sep	CCSM85	30.8	32.4	31.9	29.3	
	GFDL45	30.8	35.0	35.1	34.7	
	GFDL85	30.8	33.2	36.7	34.1	
	HAD45	30.8	30.6	29.4	27.6	
	HAD85	30.8	28.0	25.9	24.4	

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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Section 232G

EcoMap 2007
Climate Change Atlas Tree Species

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Northern Research Station
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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
slash pine	Pinus elliottii	NDH	High	66.1	2255.9	36.5	No change	Sm. dec.	Medium	Abundant	Good	Fair			1	1
cabbage palmetto	Sabal palmetto	NDH	Medium	47	498.8	17.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			0	2
pond cypress	Taxodium ascendens	NSH	Medium	30	458.3	18.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	3
longleaf pine	Pinus palustris	NSH	Medium	20.7	299.2	16.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	4
live oak	Quercus virginiana	NDH	High	45.1	299.1	7.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	5
red maple	Acer rubrum	WDH	High	28.7	297.6	7.3	No change	No change	High	Common	Good	Good			1	6
laurel oak	Quercus laurifolia	NDH	Medium	45	262.3	5.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
sand pine	Pinus clausa	NDH	High	7.2	257.3	13.5	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	8
loblolly pine	Pinus taeda	WDH	High	10.5	254.2	9.4	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	9
loblolly-bay	Gordonia lasianthus	NSH	Medium	17.3	181.1	5.6	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	10
swamp tupelo	Nyssa biflora	NDH	Medium	26.3	160.2	5.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	11
sweetgum	Liquidambar styraciflua	WDH	High	16.2	131.0	4.7	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	12
water oak	Quercus nigra	WDH	High	15.2	122.1	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	13
redbay	Persea borbonia	NSL	Low	29.2	101.2	3.4	No change	No change	High	Common	Good	Good			1	14
bald cypress	Taxodium distichum	NSH	Medium	13.4	97.6	9.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
sweetbay	Magnolia virginiana	NSL	Medium	16.1	74.3	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
pond pine	Pinus serotina	NSH	Medium	7.4	61.9	8.5	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	17
pignut hickory	Carya glabra	WDL	Medium	1.9	33.5	3.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	18
turkey oak	Quercus laevis	NSH	Medium	2.9	32.4	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
black cherry	Prunus serotina	WDL	Medium	2.2	31.4	1.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	20
green ash	Fraxinus pennsylvanica	WSH	Low	3.1	28.8	5.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
American elm	Ulmus americana	WDH	Medium	14.2	27.5	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	22
pumpkin ash	Fraxinus profunda	NSH	FIA	2.1	23.2	4.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	23
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	4.4	15.9	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
Carolina ash	Fraxinus caroliniana	NSL	FIA	4.6	14.1	5.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	25
sugarberry	Celtis laevigata	NDH	Medium	3.5	13.8	3.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	26
eastern redcedar	Juniperus virginiana	WDH	Medium	2.6	11.5	3.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	27
common persimmon	Diospyros virginiana	NSL	Low	4.1	11.2	2.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	28
southern magnolia	Magnolia grandiflora	NSL	Low	2.9	10.6	1.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
blackgum	Nyssa sylvatica	WDL	Medium	3.2	7.8	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	30
bluejack oak	Quercus incana	NSL	Low	0.8	7.3	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	31
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1.9	5.0	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	32
hackberry	Celtis occidentalis	WDH	Medium	0.9	4.0	2.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	33
white ash	Fraxinus americana	WDL	Medium	1.5	2.4	0.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	34
water hickory	Carya aquatica	NSL	Medium	0.5	2.2	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
American basswood	Tilia americana	WSL	Medium	0.3	1.9	3.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
overcup oak	Quercus lyrata	NSL	Medium	0.2	1.8	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	37
yellow-poplar	Liriodendron tulipifera	WDH	High	0.4	1.5	0.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	38
florida maple	Acer barbatum	NSL	Low	0.1	1.4	1.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	39
flowering dogwood	Cornus florida	WDL	Medium	0.1	1.2	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
swamp chestnut oak	Quercus michauxii	NSL	Low	0.4	1.0	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
American holly	Ilex opaca	NSL	Medium	0.6	0.6	0.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	42
spruce pine	Pinus glabra	NSL	Low	0.1	0.6	0.6	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	43
blackjack oak	Quercus marilandica	NSL	Medium	0.2	0.5	0.7	Very Lg. dec.	No change	High	Rare	Lost	Fair		Infill +	2	44
red mulberry	Morus rubra	NSL	Low	0.4	0.4	1.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	45
southern red oak	Quercus falcata	WDL	Medium	0.3	0.2	0.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	46
balsam fir	Abies balsamea	NDH	High	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				49
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				50
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				51
river birch	Betula nigra	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +		52
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				53
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		54
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				55
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				56
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				57
mockernut hickory	Carya alba	WDL	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +		58
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				59
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				60
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				61
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				62
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				63
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				64
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				65
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				66
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				67
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				68
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				69
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				70
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		71
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				72
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		73
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown				74
black willow	Salix nigra	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		75
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				76
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		77
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				78

