

	sq. km	sq. mi	FIA Plots
Area of Region	54,870	21,186	736

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	13	20	Increase	8	9	Very Good	2	2	Likely	0	0
Hickory	7			Medium	27	46	No Change	25	29	Good	8	8	Infill	23	26
Maple	3	Abundant	1	Low	29	7	Decrease	28	23	Fair	11	14	Migrate	2	2
Oak	15	Common	17	FIA	5		New	3	3	Poor	22	21			
Pine	3	Rare	48				Unknown	10	10	Very Poor	18	16			
Other	36	Absent	8							FIA Only	4	4			
	66		74		74	73		74	74	Unknown	5	5			
											70	70			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	66.8	68.5	69.7	70.2	
	CCSM85	66.8	68.9	71.1	73.3	
	GFDL45	66.8	71.3	71.0	72.4	
	GFDL85	66.8	69.5	72.5	76.0	
	HAD45	66.8	69.0	71.6	72.5	
HAD85	66.8	69.3	72.9	76.2		
Growing Season (May—Sep)	CCSM45	79.9	81.4	82.2	82.9	
	CCSM85	79.9	82.0	83.9	86.6	
	GFDL45	79.9	85.4	84.6	87.1	
	GFDL85	79.9	83.3	86.6	90.9	
	HAD45	79.9	82.2	84.5	85.1	
HAD85	79.9	82.7	86.7	89.6		
Coldest Month (Average)	CCSM45	46.9	49.2	49.9	50.1	
	CCSM85	46.9	49.3	50.3	51.6	
	GFDL45	46.9	50.5	50.6	50.7	
	GFDL85	46.9	48.0	49.2	49.7	
	HAD45	46.9	47.4	49.1	49.6	
HAD85	46.9	49.5	51.0	52.7		
Warmest Month (Average)	CCSM45	84.5	85.5	86.1	86.3	
	CCSM85	84.5	86.3	87.0	88.4	
	GFDL45	84.5	88.9	89.1	90.7	
	GFDL85	84.5	88.9	90.4	93.5	
	HAD45	84.5	87.1	88.1	88.4	
HAD85	84.5	87.7	89.7	90.7		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	40.1	39.8	44.1	41.3	
	CCSM85	40.1	40.6	43.7	42.8	
	GFDL45	40.1	40.6	47.1	38.9	
	GFDL85	40.1	40.0	42.4	41.2	
	HAD45	40.1	41.2	39.9	42.0	
HAD85	40.1	42.4	37.1	39.5		
Growing Season (May—Sep)	CCSM45	16.4	17.4	18.1	17.1	
	CCSM85	16.4	16.5	16.9	15.7	
	GFDL45	16.4	17.5	21.8	16.7	
	GFDL85	16.4	17.8	18.8	18.3	
	HAD45	16.4	16.2	15.5	16.7	
HAD85	16.4	16.7	13.9	14.5		

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 255C

EcoMap 2007
Climate Change Atlas Tree Species

USDA Forest Service
Northern Research Station
Landscape Change Research Group
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
post oak	Quercus stellata	WDH	High	79.8	960.6	25.7	No change	No change	High	Abundant	Very Good	Very Good			1	1
loblolly pine	Pinus taeda	WDH	High	17.7	428.2	20.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	2
water oak	Quercus nigra	WDH	High	50.7	316.7	10.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	3
winged elm	Ulmus alata	WDL	Medium	48.6	287.6	9.2	No change	No change	Medium	Common	Fair	Fair			1	4
eastern redcedar	Juniperus virginiana	WDH	Medium	60.2	263.0	10.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
cedar elm	Ulmus crassifolia	NDH	Medium	49	201.1	10.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	6
sugarberry	Celtis laevigata	NDH	Medium	51	194.4	7.5	No change	No change	Medium	Common	Fair	Fair			1	7
sweetgum	Liquidambar styraciflua	WDH	High	16.3	168.8	10.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	8
green ash	Fraxinus pennsylvanica	WSH	Low	36.5	144.3	7.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
blackjack oak	Quercus marilandica	NSL	Medium	37.9	143.3	7.7	No change	No change	High	Common	Good	Good			1	10
southern red oak	Quercus falcata	WDL	Medium	20.9	128.4	6.8	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	11
pecan	Carya illinoensis	NSH	Low	20.2	102.8	11.7	Sm. dec.	No change	Low	Common	Poor	Poor			0	12
live oak	Quercus virginiana	NDH	High	16.7	91.4	16.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	13
American elm	Ulmus americana	WDH	Medium	28.7	90.0	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
black hickory	Carya texana	NDL	High	24.1	86.8	6.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
shortleaf pine	Pinus echinata	WDH	High	8.5	75.9	7.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	16
Osage-orange	Maclura pomifera	NDH	Medium	22.4	63.4	8.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	17
willow oak	Quercus phellos	NSL	Low	15.5	57.0	7.0	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	18
honeylocust	Gleditsia triacanthos	NSH	Low	21.8	47.5	6.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	19
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	24.5	43.4	3.9	Sm. inc.	Lg. inc.	High	Rare	Good	Good			1	20
mockernut hickory	Carya alba	WDL	Medium	15.4	39.5	4.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	21
black willow	Salix nigra	NSH	Low	7.9	35.2	7.8	No change	No change	Low	Rare	Very Poor	Very Poor			0	22
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	5.9	27.3	3.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	23
white ash	Fraxinus americana	WDL	Medium	12.3	22.3	3.3	No change	No change	Low	Rare	Very Poor	Very Poor			0	24
blackgum	Nyssa sylvatica	WDL	Medium	7.8	19.8	3.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	25
overcup oak	Quercus lyrata	NSL	Medium	4.5	18.5	6.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	26
common persimmon	Diospyros virginiana	NSL	Low	7.6	17.5	2.5	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	27
black walnut	Juglans nigra	WDH	Low	2.9	17.2	12.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
bluejack oak	Quercus incana	NSL	Low	5.6	15.7	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	29
hackberry	Celtis occidentalis	WDH	Medium	9	13.2	5.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	30
American holly	Ilex opaca	NSL	Medium	3.5	11.4	3.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	31
river birch	Betula nigra	NSL	Low	3.6	10.2	3.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
black oak	Quercus velutina	WDH	High	2	10.2	4.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	33
flowering dogwood	Cornus florida	WDL	Medium	7.8	10.1	1.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
boxelder	Acer negundo	WSH	Low	7	9.6	2.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	35
sassafras	Sassafras albidum	WSL	Low	5.9	9.4	2.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	36
slash pine	Pinus elliottii	NDH	High	2.1	9.1	17.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	37
bitternut hickory	Carya cordiformis	WSL	Low	3.7	8.4	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	38
slippery elm	Ulmus rubra	WSL	Low	7.2	6.8	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	39
Shumard oak	Quercus shumardii	NSL	Low	7.7	6.8	4.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	40
red maple	Acer rubrum	WDH	High	4.3	6.7	2.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	41
black cherry	Prunus serotina	WDL	Medium	4.3	6.5	1.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	42
white oak	Quercus alba	WDH	Medium	1.2	6.3	2.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	43
red mulberry	Morus rubra	NSL	Low	13	5.9	1.8	No change	No change	Medium	Rare	Poor	Poor			1	44
water hickory	Carya aquatica	NSL	Medium	4.4	5.5	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	45
eastern redbud	Cercis canadensis	NSL	Low	4.9	5.3	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
sycamore	Platanus occidentalis	NSL	Low	1.4	4.4	4.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			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
water elm	Planera aquatica	NSL	Low	1.7	4.0	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
Siberian elm	Ulmus pumila	NDH	FIA	0.1	2.5	4.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	49
eastern cottonwood	Populus deltoides	NSH	Low	1.9	2.4	7.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	50
bur oak	Quercus macrocarpa	NDH	Medium	3.6	2.4	2.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	51
American basswood	Tilia americana	WSL	Medium	1.1	2.3	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	52
shagbark hickory	Carya ovata	WSL	Medium	2.7	2.1	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
wild plum	Prunus americana	NSLX	FIA	1	1.7	3.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	54
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	1.2	1.6	1.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	55
pignut hickory	Carya glabra	WDL	Medium	1.9	1.5	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0.7	1.2	0.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	57
laurel oak	Quercus laurifolia	NDH	Medium	0.2	0.9	4.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	58
ashe juniper	Juniperus ashei	NDH	High	0.2	0.6	2.4	No change	No change	Medium	Rare	Poor	Poor			0	59
peachleaf willow	Salix amygdaloides	NSLX	FIA	1	0.5	2.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
florida maple	Acer barbatum	NSL	Low	0.1	0.3	0.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	61
bald cypress	Taxodium distichum	NSH	Medium	0	0.3	0.1	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	62
black locust	Robinia pseudoacacia	NDH	Low	0.4	0.2	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	63
durand oak	Quercus sinuata var. sinuata	NSL	FIA	1.3	0.2	1.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	64
redbay	Persea borbonia	NSL	Low	0.7	0.0	0.5	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	65
waterlocust	Gleditsia aquatica	NSLX	FIA	0.1	0.0	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	66
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	67
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	68
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	71
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	72
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74

