

	sq. km	sq. mi	FIA Plots
Area of Region	18,675	7,210.4	793

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	3			High	22	Increase	17	21	Very Good	7	9	Likely	1	1
Hickory	4			Medium	27	No Change	9	3	Good	10	10	Infill	10	12
Maple	6	Abundant	7	Low	25	Decrease	25	27	Fair	9	7	Migrate	3	11
Oak	7	Common	18	FIA	6	New	15	16	Poor	15	13			
Pine	6	Rare	32			Unknown	14	13	Very Poor	8	5			
Other	31	Absent	22						FIA Only	4	4			
	57		79		80		80	80	Unknown	8	7		14	24
										61	55			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	45.6	47.5	50.0	50.1	
	CCSM85	45.6	47.9	50.5	53.8	
	GFDL45	45.6	48.4	51.6	52.9	
	GFDL85	45.6	49.1	52.8	57.3	
	HAD45	45.6	48.6	52.0	53.7	
HAD85	45.6	48.7	53.0	58.3		
Growing Season (May—Sep)	CCSM45	61.9	63.9	66.1	66.5	
	CCSM85	61.9	64.2	66.8	70.8	
	GFDL45	61.9	65.0	69.3	71.0	
	GFDL85	61.9	66.5	70.8	75.7	
	HAD45	61.9	65.4	68.2	70.6	
HAD85	61.9	64.9	70.1	76.0		
Coldest Month Average	CCSM45	20.2	22.3	24.3	24.5	
	CCSM85	20.2	23.1	24.4	26.4	
	GFDL45	20.2	23.2	24.5	25.2	
	GFDL85	20.2	23.7	25.1	27.1	
	HAD45	20.2	21.8	24.8	24.9	
HAD85	20.2	22.9	25.2	28.2		
Warmest Month Average	CCSM45	67.7	69.9	71.2	71.5	
	CCSM85	67.7	70.4	72.0	74.3	
	GFDL45	67.7	70.6	73.1	74.4	
	GFDL85	67.7	72.3	74.9	78.0	
	HAD45	67.7	71.5	73.3	75.0	
HAD85	67.7	71.8	75.2	79.4		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	43.5	44.4	44.1	46.7	
	CCSM85	43.5	44.8	46.1	47.6	
	GFDL45	43.5	48.1	49.5	49.0	
	GFDL85	43.5	45.1	49.2	50.3	
	HAD45	43.5	44.1	44.9	44.7	
HAD85	43.5	45.8	43.2	46.9		
Growing Season (May—Sep)	CCSM45	21.1	21.4	21.0	22.2	
	CCSM85	21.1	20.8	21.6	21.3	
	GFDL45	21.1	22.4	21.9	21.5	
	GFDL85	21.1	20.7	21.5	20.9	
	HAD45	21.1	21.1	19.4	20.1	
HAD85	21.1	21.2	18.4	19.4		

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 211G

EcoMap 2007
Climate Change Atlas Tree Species

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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
red maple	Acer rubrum	WDH	High	96.8	2778.0	18.1	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	78.8	1417.7	12.7	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
black cherry	Prunus serotina	WDL	Medium	76.1	1242.5	11.4	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	3
American beech	Fagus grandifolia	WDH	High	77.7	889.1	8.4	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	4
sweet birch	Betula lenta	NDH	High	85.6	768.8	6.4	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	5
eastern hemlock	Tsuga canadensis	NSH	High	62.2	731.7	7.0	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	6
northern red oak	Quercus rubra	WDH	Medium	64.5	719.6	7.5	No change	Sm. inc.	High	Abundant	Very Good	Very Good			1	7
white oak	Quercus alba	WDH	Medium	43.9	456.9	7.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	8
chestnut oak	Quercus prinus	NDH	High	33.3	382.6	7.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
white ash	Fraxinus americana	WDL	Medium	59.2	367.6	4.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	10
eastern white pine	Pinus strobus	WDH	High	34.1	276.2	5.1	Sm. inc.	No change	Low	Common	Fair	Poor			1	11
yellow birch	Betula alleghaniensis	NDL	High	54.2	258.6	3.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
quaking aspen	Populus tremuloides	WDH	High	22.1	199.0	4.9	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	13
black oak	Quercus velutina	WDH	High	28.4	145.9	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	14
pin cherry	Prunus pensylvanica	NSL	Low	22	135.1	4.3	Lg. dec.	Very Lg. dec.	Medium	Common	Poor	Lost			0	15
American basswood	Tilia americana	WSL	Medium	32.1	103.0	2.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	16
serviceberry	Amelanchier spp.	NSL	Low	46.2	95.9	1.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
red pine	Pinus resinosa	NSH	Medium	6	90.0	5.7	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	18
bigtooth aspen	Populus grandidentata	NSL	Medium	21.1	90.0	3.4	Sm. inc.	Sm. dec.	Medium	Common	Good	Poor			1	19
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	35.2	78.2	1.3	No change	Sm. inc.	High	Common	Good	Very Good			1	20
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	26.1	69.2	2.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	21
blackgum	Nyssa sylvatica	WDL	Medium	21.3	64.9	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
scarlet oak	Quercus coccinea	WDL	Medium	14.7	64.4	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
striped maple	Acer pensylvanicum	NSL	Medium	30.5	63.7	1.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
yellow-poplar	Liriodendron tulipifera	WDH	High	16.2	56.3	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	25
paper birch	Betula papyrifera	WDH	High	9.5	48.5	3.8	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	26
cucumber tree	Magnolia acuminata	NSL	Low	20.1	45.1	1.8	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			1	27
sassafras	Sassafras albidum	WSL	Low	15.7	44.3	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	28
Norway spruce	Picea abies	NSH	FIA	5.8	43.5	2.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
Scots pine	Pinus sylvestris	NSH	FIA	4	42.2	3.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	30
pignut hickory	Carya glabra	WDL	Medium	17	41.6	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	31
black locust	Robinia pseudoacacia	NDH	Low	4.8	38.1	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	32
American elm	Ulmus americana	WDH	Medium	9.8	35.1	1.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	33
shagbark hickory	Carya ovata	WSL	Medium	7.5	27.5	1.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	34
bitternut hickory	Carya cordiformis	WSL	Low	5.7	25.9	2.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	35
white spruce	Picea glauca	NSL	Medium	2.7	24.1	9.0	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	36
pitch pine	Pinus rigida	NSH	High	4.5	19.7	3.3	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		1	37
sycamore	Platanus occidentalis	NSL	Low	1.1	18.4	17.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	38
black willow	Salix nigra	NSH	Low	1.6	18.3	11.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	39
mockernut hickory	Carya alba	WDL	Medium	4.7	14.9	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
black walnut	Juglans nigra	WDH	Low	1.5	14.9	9.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	41
butternut	Juglans cinerea	NSLX	FIA	0.4	13.4	19.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	42
Virginia pine	Pinus virginiana	NDH	High	0.4	8.5	12.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	43
boxelder	Acer negundo	WSH	Low	0.1	8.3	2.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	44
green ash	Fraxinus pennsylvanica	WSH	Low	1.3	8.1	4.5	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	45
gray birch	Betula populifolia	NSL	Low	1.7	7.0	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
shingle oak	Quercus imbricaria	NDH	Medium	0.8	4.5	2.5	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	
silver maple	Acer saccharinum	NSH	Low	1.1	4.4	4.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	48	
jack pine	Pinus banksiana	NSH	Medium	0.5	3.3	5.7	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	49	
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1.4	3.1	1.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	50	
flowering dogwood	Cornus florida	WDL	Medium	1.6	2.7	1.1	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	2	51	
American chestnut	Castanea dentata	NSLX	FIA	3.5	2.5	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	52	
red spruce	Picea rubens	NDH	High	0.5	2.5	4.6	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	53	
black ash	Fraxinus nigra	WSH	Medium	1.1	2.4	2.2	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	54	
slippery elm	Ulmus rubra	WSL	Low	1.4	1.7	0.8	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill +	2	55	
chokecherry	Prunus virginiana	NSLX	FIA	0.6	0.9	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56	
mountain maple	Acer spicatum	NSL	Low	0.5	0.1	0.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	57	
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Likely +	Likely +	3	58
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate ++	3	59
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate ++	3	60
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	61
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	62
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0	63
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	64
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	65
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0	66
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	Migrate +	3	67
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			Migrate +	3	68
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	69
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate ++	3	70
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	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	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	Migrate +	3	73
eastern cottonwood	Populus deltoides	NSH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	Migrate ++	3	74
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			Migrate +	3	75
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	76
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	77
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate +	3	78
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			Migrate ++	3	79
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			Migrate +	3	80

