

	sq. km	sq. mi	FIA Plots
Area of Region	23,621	9,120.1	682

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	23	29	Increase	33	35	Very Good	17	19	Likely	3	4
Hickory	9			Medium	37	58	No Change	14	13	Good	15	16	Infill	17	17
Maple	5	Abundant	6	Low	41	17	Decrease	30	29	Fair	12	10	Migrate	4	5
Oak	17	Common	28	FIA	7		New	13	15	Poor	14	14			
Pine	6	Rare	50				Unknown	18	16	Very Poor	19	18			
Other	44	Absent	23							FIA Only	4	4			
	84		107		108	104		108	108	Unknown	11	9		24	26
											92	90			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	60.1	61.8	64.0	64.1	
	CCSM85	60.1	62.2	64.7	67.4	
	GFDL45	60.1	62.9	64.8	65.6	
	GFDL85	60.1	62.7	65.9	69.3	
	HAD45	60.1	62.4	65.4	66.8	
	HAD85	60.1	62.8	67.2	70.9	
Growing Season (May—Sep)	CCSM45	74.2	75.8	77.7	78.2	
	CCSM85	74.2	76.0	78.7	82.2	
	GFDL45	74.2	77.1	79.3	80.7	
	GFDL85	74.2	76.9	80.7	84.6	
	HAD45	74.2	77.5	80.3	81.7	
	HAD85	74.2	77.6	84.0	87.4	
Coldest Month Average	CCSM45	38.9	41.1	42.0	42.1	
	CCSM85	38.9	41.6	42.7	44.0	
	GFDL45	38.9	42.5	42.5	42.8	
	GFDL85	38.9	40.6	41.8	42.2	
	HAD45	38.9	38.8	40.8	41.3	
	HAD85	38.9	40.1	41.5	43.1	
Warmest Month Average	CCSM45	79.0	80.7	81.5	81.7	
	CCSM85	79.0	80.8	82.3	84.1	
	GFDL45	79.0	81.8	83.0	83.9	
	GFDL85	79.0	81.7	83.8	85.8	
	HAD45	79.0	83.4	85.7	86.2	
	HAD85	79.0	84.0	88.4	89.7	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	56.0	58.2	62.3	61.1	
	CCSM85	56.0	59.4	60.9	67.0	
	GFDL45	56.0	63.4	66.3	69.5	
	GFDL85	56.0	63.3	66.1	69.2	
	HAD45	56.0	53.9	60.3	60.8	
	HAD85	56.0	58.6	52.5	58.0	
Growing Season (May—Sep)	CCSM45	21.7	21.8	22.3	22.9	
	CCSM85	21.7	21.4	21.0	23.1	
	GFDL45	21.7	26.1	27.4	27.8	
	GFDL85	21.7	26.3	28.0	29.3	
	HAD45	21.7	20.4	22.3	21.3	
	HAD85	21.7	22.7	16.5	18.6	

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-DPC30 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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EcoMap 2007
Climate Change Atlas Tree Species

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Northern Research Station
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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	74.4	2345.5	22.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	73.6	802.5	8.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
Virginia pine	Pinus virginiana	NDH	High	56.6	783.1	10.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
yellow-poplar	Liriodendron tulipifera	WDH	High	68.5	630.7	7.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	74.1	608.3	6.6	No change	No change	High	Abundant	Very Good	Very Good			1	5
chestnut oak	Quercus prinus	NDH	High	57.6	596.8	8.1	No change	Sm. dec.	High	Abundant	Very Good	Good			1	6
red maple	Acer rubrum	WDH	High	75.6	405.6	4.3	No change	Sm. inc.	High	Common	Good	Very Good			1	7
pignut hickory	Carya glabra	WDL	Medium	71.5	362.0	3.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
mockernut hickory	Carya alba	WDL	Medium	64.3	318.5	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	9
southern red oak	Quercus falcata	WDL	Medium	52.8	314.3	4.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	10
blackgum	Nyssa sylvatica	WDL	Medium	68	225.2	2.5	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
shortleaf pine	Pinus echinata	WDH	High	44.5	214.6	3.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
eastern redcedar	Juniperus virginiana	WDH	Medium	32.9	212.7	4.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
black cherry	Prunus serotina	WDL	Medium	66.5	192.2	2.2	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	14
sourwood	Oxydendrum arboreum	NDL	High	55.4	189.0	2.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	15
post oak	Quercus stellata	WDH	High	51.9	175.0	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	16
winged elm	Ulmus alata	WDL	Medium	49.7	170.8	2.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
water oak	Quercus nigra	WDH	High	33.3	165.8	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
northern red oak	Quercus rubra	WDH	Medium	47.3	153.4	2.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	19
scarlet oak	Quercus coccinea	WDL	Medium	41.6	152.3	3.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	20
black oak	Quercus velutina	WDH	High	45.8	146.4	2.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	21
shagbark hickory	Carya ovata	WSL	Medium	26.3	146.1	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	22
green ash	Fraxinus pennsylvanica	WSH	Low	28.5	122.4	2.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
white ash	Fraxinus americana	WDL	Medium	25	105.5	3.2	No change	No change	Low	Common	Poor	Poor			0	24
chinkapin oak	Quercus muehlenbergii	NSL	Medium	18.8	100.0	4.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	25
flowering dogwood	Cornus florida	WDL	Medium	52.6	94.5	1.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	26
florida maple	Acer barbatum	NSL	Low	30.9	94.4	2.8	Sm. dec.	No change	High	Common	Fair	Good			1	27
American beech	Fagus grandifolia	WDH	High	28.9	66.7	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
sassafras	Sassafras albidum	WSL	Low	25.8	56.7	1.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	29
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	30.9	56.0	1.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
red mulberry	Morus rubra	NSL	Low	8.5	55.1	2.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	31
common persimmon	Diospyros virginiana	NSL	Low	31	54.4	1.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
sugarberry	Celtis laevigata	NDH	Medium	10	52.7	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	33
American elm	Ulmus americana	WDH	Medium	17.5	51.8	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	34
willow oak	Quercus phellos	NSL	Low	5	47.4	6.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	35
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	10.9	47.4	2.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	36
hackberry	Celtis occidentalis	WDH	Medium	9.5	47.2	3.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	37
sugar maple	Acer saccharum	WDH	High	8.5	46.7	3.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	38
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	18.6	40.1	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	39
boxelder	Acer negundo	WSH	Low	7.3	39.7	3.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	40
eastern redbud	Cercis canadensis	NSL	Low	19.9	36.3	1.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	41
bigleaf magnolia	Magnolia macrophylla	NSL	Low	10.6	36.2	3.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
black walnut	Juglans nigra	WDH	Low	8.5	26.3	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
black locust	Robinia pseudoacacia	NDH	Low	8.9	25.3	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
black willow	Salix nigra	NSH	Low	4.9	24.1	3.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	45
sycamore	Platanus occidentalis	NSL	Low	6.1	23.9	2.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	46
longleaf pine	Pinus palustris	NSH	Medium	2.2	21.5	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	47



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honeylocust	Gleditsia triacanthos	NSH	Low	5.5	19.7	2.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	48
eastern hemlock	Tsuga canadensis	NSH	High	2.1	19.5	9.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	49
blackjack oak	Quercus marilandica	NSL	Medium	4.6	14.9	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	50
bitternut hickory	Carya cordiformis	WSL	Low	2.8	13.8	2.8	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor		Infill +	2	51
slippery elm	Ulmus rubra	WSL	Low	9.2	13.8	0.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	52
American basswood	Tilia americana	WSL	Medium	6.5	13.4	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
paulownia	Paulownia tomentosa	NSL	FIA	3.9	12.2	2.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
yellow buckeye	Aesculus flava	NSL	Low	4.3	10.2	1.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	55
cucumbertree	Magnolia acuminata	NSL	Low	5.5	10.2	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	56
river birch	Betula nigra	NSL	Low	2.2	9.8	3.6	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	57
shellbark hickory	Carya laciniosa	NSL	Low	2	6.2	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	58
serviceberry	Amelanchier spp.	NSL	Low	7.9	6.1	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	59
water tupelo	Nyssa aquatica	NSH	Medium	0.3	5.9	8.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	60
slash pine	Pinus elliotii	NDH	High	0.3	5.8	8.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
Shumard oak	Quercus shumardii	NSL	Low	2.6	5.8	1.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	62
sand hickory	Carya pallida	NSL	FIA	0.8	5.4	3.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	63
Nuttall oak	Quercus texana	NSH	Medium	0.4	4.5	10.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	64
ailanthus	Ailanthus altissima	NSL	FIA	1	3.7	1.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	65
butternut	Juglans cinerea	NSLX	FIA	3.6	3.3	0.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	66
white mulberry	Morus alba	NSL	FIA	1.3	3.3	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	67
pin cherry	Prunus pensylvanica	NSL	Low	0.8	3.2	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	68
bald cypress	Taxodium distichum	NSH	Medium	0.4	2.4	5.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	69
blue ash	Fraxinus quadrangulata	NSL	Low	1.3	1.9	1.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	70
laurel oak	Quercus laurifolia	NDH	Medium	3	1.9	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	71
sweet birch	Betula lenta	NDH	High	0.9	1.7	2.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	72
swamp chestnut oak	Quercus michauxii	NSL	Low	1.3	1.7	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	73
American holly	Ilex opaca	NSL	Medium	1.8	1.5	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	74
black hickory	Carya texana	NDL	High	0.8	1.2	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	75
eastern white pine	Pinus strobus	WDH	High	0	1.2	0.2	No change	No change	Low	Rare	Very Poor	Very Poor			2	76
pecan	Carya illinoensis	NSH	Low	0.7	1.0	0.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	77
silver maple	Acer saccharinum	NSH	Low	0.6	0.8	0.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	78
wild plum	Prunus americana	NSLX	FIA	1.1	0.6	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	79
pawpaw	Asimina triloba	NSL	Low	0.9	0.5	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	80
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0.4	0.5	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	81
overcup oak	Quercus lyrata	NSL	Medium	0.3	0.3	0.5	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	82
rock elm	Ulmus thomasii	NSLX	FIA	0.3	0.3	0.6	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	83
water hickory	Carya aquatica	NSL	Medium	0.4	0.2	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	84
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	85
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	86
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	87
pitch pine	Pinus rigida	NSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	88
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	89
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	90
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	91
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	92
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	93
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	94



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loblolly-bay	Gordonia lasianthus	NSH	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	95
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	96
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	97
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	98
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	99
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	100
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	101
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Likely +	3	102
water elm	Planera aquatica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	103
turkey oak	Quercus laevis	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	104
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	105
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	106
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	107
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	108