

sq. km sq. mi FIA Plots
Area of Region 8,588.7 3,316.1 165

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	21	25	Increase	24	26	Very Good	7	7	Likely	0	0
Hickory	4			Medium	36	54	No Change	16	13	Good	18	20	Infill	32	36
Maple	6	Abundant	2	Low	32	14	Decrease	21	22	Fair	13	11	Migrate	4	6
Oak	12	Common	26	FIA	9		New	21	22	Poor	11	11			
Pine	7	Rare	42				Unknown	16	15	Very Poor	11	11			
Other	39	Absent	26							FIA Only	4	4			
	70		96		98	93		98	98	Unknown	7	6			
											71	70			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	54.0	55.8	58.0	58.3	
Average	CCSM85	54.0	56.2	58.7	61.8	
	GFDL45	54.0	57.9	59.7	60.8	
	GFDL85	54.0	57.4	60.8	64.9	
	HAD45	54.0	56.6	60.1	61.5	
	HAD85	54.0	56.9	61.0	65.6	
Growing Season	CCSM45	69.8	71.7	73.6	74.1	
	CCSM85	69.8	72.0	74.6	78.5	
May—Sep	GFDL45	69.8	74.3	76.6	78.2	
	GFDL85	69.8	74.1	78.0	82.5	
	HAD45	69.8	72.9	76.1	78.0	
	HAD85	69.8	72.8	77.8	82.9	
Coldest Month	CCSM45	30.3	32.1	33.6	34.1	
	CCSM85	30.3	32.7	34.0	35.6	
Average	GFDL45	30.3	33.4	34.0	34.7	
	GFDL85	30.3	33.1	34.2	35.6	
	HAD45	30.3	31.9	34.1	34.3	
	HAD85	30.3	32.4	34.2	36.1	
Warmest Month	CCSM45	75.7	77.8	78.8	79.1	
	CCSM85	75.7	78.0	79.9	81.6	
Average	GFDL45	75.7	78.8	80.8	82.2	
	GFDL85	75.7	80.4	82.7	85.5	
	HAD45	75.7	79.1	81.2	82.4	
	HAD85	75.7	79.5	82.7	86.3	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	40.1	43.5	44.7	46.1	
Total	CCSM85	40.1	43.8	45.1	50.9	
	GFDL45	40.1	44.8	47.2	47.5	
	GFDL85	40.1	41.3	47.4	48.5	
	HAD45	40.1	42.9	43.6	42.8	
	HAD85	40.1	45.6	41.4	44.9	
Growing Season	CCSM45	18.3	21.1	21.8	22.2	
	CCSM85	18.3	21.0	21.2	23.8	
May—Sep	GFDL45	18.3	19.4	20.1	20.3	
	GFDL85	18.3	17.5	19.8	20.1	
	HAD45	18.3	19.9	18.4	17.9	
	HAD85	18.3	20.1	17.3	18.3	

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-DGP30 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
chestnut oak	Quercus prinus	NDH	High	69	654.2	13.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good	Infill ++	Infill ++	1	1
white oak	Quercus alba	WDH	Medium	57.8	611.0	13.0	No change	No change	High	Abundant	Very Good	Very Good	Infill ++	Infill ++	1	2
red maple	Acer rubrum	WDH	High	66.3	489.6	9.8	No change	Sm. dec.	High	Common	Good	Fair	Infill ++	Infill +	1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	58.1	465.7	12.0	Sm. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	4
Virginia pine	Pinus virginiana	NDH	High	44.6	340.2	9.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	5
black locust	Robinia pseudoacacia	NDH	Low	51.6	284.9	8.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	6
black cherry	Prunus serotina	WDL	Medium	57.8	260.3	6.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	7
northern red oak	Quercus rubra	WDH	Medium	64.7	257.9	5.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
pignut hickory	Carya glabra	WDL	Medium	54.7	220.5	5.2	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	9
sugar maple	Acer saccharum	WDH	High	19.8	209.2	10.6	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	10
black oak	Quercus velutina	WDH	High	45.4	193.2	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
white ash	Fraxinus americana	WDL	Medium	46.2	178.9	6.3	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	12
blackgum	Nyssa sylvatica	WDL	Medium	55.8	174.2	4.1	No change	Sm. inc.	High	Common	Good	Very Good	Infill ++	Infill ++	1	13
black walnut	Juglans nigra	WDH	Low	40.8	168.9	5.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	14
scarlet oak	Quercus coccinea	WDL	Medium	39.2	167.2	5.6	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	15
boxelder	Acer negundo	WSH	Low	19.4	160.7	9.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair		Infill +	1	16
American beech	Fagus grandifolia	WDH	High	25.5	153.3	8.6	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	2	17
eastern redcedar	Juniperus virginiana	WDH	Medium	25.6	153.3	8.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	18
mockernut hickory	Carya alba	WDL	Medium	36.8	123.2	4.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
sycamore	Platanus occidentalis	NSL	Low	28.7	110.4	9.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	20
hackberry	Celtis occidentalis	WDH	Medium	25.2	77.3	4.2	Sm. dec.	No change	High	Common	Fair	Good		Infill ++	2	21
eastern white pine	Pinus strobus	WDH	High	14	76.8	5.5	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor	Infill +		0	22
loblolly pine	Pinus taeda	WDH	High	5.8	76.0	13.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	23
sweet birch	Betula lenta	NDH	High	16.3	68.4	4.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	24
silver maple	Acer saccharinum	NSH	Low	5.8	66.5	11.4	Sm. dec.	No change	High	Common	Fair	Good			2	25
sassafras	Sassafras albidum	WSL	Low	29.4	66.2	2.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	26
eastern cottonwood	Populus deltoides	NSH	Low	1.2	64.9	55.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	27
ailanthus	Ailanthus altissima	NSL	FIA	32.2	52.0	3.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	28
American elm	Ulmus americana	WDH	Medium	34.5	44.6	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	29
serviceberry	Amelanchier spp.	NSL	Low	19.8	41.0	2.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
shagbark hickory	Carya ovata	WSL	Medium	21	40.3	2.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	31
eastern redbud	Cercis canadensis	NSL	Low	18.6	33.8	2.3	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	32
Osage-orange	Maclura pomifera	NDH	Medium	2.3	33.0	14.2	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	33
eastern hemlock	Tsuga canadensis	NSH	High	5.8	31.0	5.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	34
American basswood	Tilia americana	WSL	Medium	5.8	29.4	5.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	35
pin oak	Quercus palustris	NSH	Low	10.5	26.3	13.0	No change	No change	Low	Rare	Very Poor	Very Poor			2	36
green ash	Fraxinus pennsylvanica	WSH	Low	14.8	25.6	3.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
bitternut hickory	Carya cordiformis	WSL	Low	21	24.9	3.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	38
bigtooth aspen	Populus grandidentata	NSL	Medium	4.7	21.8	4.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
red mulberry	Morus rubra	NSL	Low	7	21.2	11.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
slippery elm	Ulmus rubra	WSL	Low	11.6	20.8	2.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	41
southern red oak	Quercus falcata	WDL	Medium	10	19.1	2.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	42
pawpaw	Asimina triloba	NSL	Low	10.5	18.9	2.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	16.3	16.0	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good		Infill ++	1	44
American holly	Ilex opaca	NSL	Medium	9.6	15.8	2.3	No change	No change	Medium	Rare	Poor	Poor			0	45
pitch pine	Pinus rigida	NSH	High	11.6	14.2	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
sweetgum	Liquidambar styraciflua	WDH	High	6.2	13.2	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
flowering dogwood	Cornus florida	WDL	Medium	24.5	12.7	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	48
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	10.1	10.0	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	49
cucumber tree	Magnolia acuminata	NSL	Low	4.7	8.7	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	50
white mulberry	Morus alba	NSL	FIA	2.3	8.4	3.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	51
honeylocust	Gleditsia triacanthos	NSH	Low	2.3	7.9	3.4	No change	No change	High	Rare	Fair	Fair			2	52
Table Mountain pine	Pinus pungens	NSL	Low	4.7	7.1	1.5	No change	No change	High	Rare	Fair	Fair		Infill +	2	53
striped maple	Acer pensylvanicum	NSL	Medium	2.3	6.0	2.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
Norway maple	Acer platanoides	NSL	FIA	5.8	4.7	4.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	55
common persimmon	Diospyros virginiana	NSL	Low	6.6	4.2	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	56
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	3.7	3.2	No change	No change	Medium	Rare	Poor	Poor			0	57
black willow	Salix nigra	NSH	Low	1.2	3.5	3.0	No change	Lg. inc.	Low	Rare	Very Poor	Fair			2	58
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	5.8	3.1	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	59
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.2	2.9	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	60
shortleaf pine	Pinus echinata	WDH	High	2.3	2.5	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
paulownia	Paulownia tomentosa	NSL	FIA	1.2	2.4	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	62
Scots pine	Pinus sylvestris	NSH	FIA	2.3	1.9	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	63
river birch	Betula nigra	NSL	Low	1.2	1.7	1.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			2	64
American chestnut	Castanea dentata	NSLX	FIA	1.2	1.3	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	65
post oak	Quercus stellata	WDH	High	1.2	1.1	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	66
yellow birch	Betula alleghaniensis	NDL	High	1.2	1.0	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	67
butternut	Juglans cinerea	NSLX	FIA	1.2	0.8	0.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	68
shingle oak	Quercus imbricaria	NDH	Medium	1.2	0.8	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	69
chokecherry	Prunus virginiana	NSLX	FIA	1.2	0.4	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	70
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
bald cypress	Taxodium distichum	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	72
florida maple	Acer barbatum	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	74
water hickory	Carya aquatica	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	76
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	77
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	78
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	80
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
water tupelo	Nyssa aquatica	NSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	83
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	84
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	85
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	86
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	87
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	88
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	89
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	90
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	91
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	92
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	93
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	94

Chesapeake and Ohio Canal

National Park 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	FIAlv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	95
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	96
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	97
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	98