

One x One Degree
Climate Change Atlas Tree Species
 Current and Potential Future Habitat, Capability, and Migration

sq. km sq. mi FIA Plots
 Area of Region 10,188 3,933.4 405

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	22	23	Increase	26	30	Very Good	13	14	Likely	2	2
Ash	2			Medium	30	56	No Change	20	18	Good	13	15	Infill	14	18
Hickory	5			Low	39	14	Decrease	15	13	Fair	11	10	Migrate	9	9
Maple	4	Abundant	10	FIA	5		New	19	19	Poor	13	13			
Oak	13	Common	16				Unknown	16	16	Very Poor	10	8			
Pine	6	Rare	40							FIA Only	3	3			
Other	36	Absent	27							Unknown	11	11			
	66		93		96	93		96	96		74	74			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.0	60.8	62.9	63.0	
	CCSM85	59.0	61.2	63.7	66.4	
	GFDL45	59.0	61.7	64.0	64.7	
	GFDL85	59.0	61.8	65.1	68.7	
	HAD45	59.0	61.3	64.2	65.5	
	HAD85	59.0	61.6	65.7	69.7	
Growing Season May—Sep	CCSM45	72.4	74.1	76.0	76.4	
	CCSM85	72.4	74.3	77.0	80.5	
	GFDL45	72.4	75.4	77.8	79.1	
	GFDL85	72.4	75.6	79.4	83.5	
	HAD45	72.4	75.5	78.1	79.7	
	HAD85	72.4	75.4	81.3	85.1	
Coldest Month Average	CCSM45	39.2	41.7	42.5	42.4	
	CCSM85	39.2	41.8	42.8	44.0	
	GFDL45	39.2	42.4	42.5	43.0	
	GFDL85	39.2	41.0	42.1	42.6	
	HAD45	39.2	39.3	41.1	41.5	
	HAD85	39.2	40.4	41.5	43.2	
Warmest Month Average	CCSM45	77.0	79.1	80.0	79.9	
	CCSM85	77.0	79.2	80.7	82.5	
	GFDL45	77.0	80.1	81.1	82.0	
	GFDL85	77.0	80.5	82.5	84.6	
	HAD45	77.0	80.9	82.6	83.3	
	HAD85	77.0	81.3	85.1	87.1	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	56.5	59.5	63.3	63.3	
	CCSM85	56.5	60.0	62.9	70.1	
	GFDL45	56.5	63.2	66.3	70.7	
	GFDL85	56.5	62.4	67.8	68.6	
	HAD45	56.5	55.6	60.1	62.1	
	HAD85	56.5	62.7	56.5	60.4	
Growing Season May—Sep	CCSM45	23.1	25.2	27.2	27.5	
	CCSM85	23.1	24.9	25.4	28.6	
	GFDL45	23.1	28.1	30.2	31.4	
	GFDL85	23.1	27.0	31.2	31.8	
	HAD45	23.1	22.8	23.4	24.1	
	HAD85	23.1	26.3	20.5	21.9	

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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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
yellow-poplar	Liriodendron tulipifera	WDH	High	89.8	1355.0	10.6	Sm. dec.	Lg. dec.	High	Abundant	Good	Good			1	1
loblolly pine	Pinus taeda	WDH	High	54.3	1293.3	14.6	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	2
white oak	Quercus alba	WDH	Medium	88.8	965.3	7.4	No change	No change	High	Abundant	Very Good	Very Good			1	3
sweetgum	Liquidambar styraciflua	WDH	High	60.8	840.5	9.0	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
red maple	Acer rubrum	WDH	High	81.8	725.4	5.7	No change	No change	High	Abundant	Very Good	Very Good			1	5
shortleaf pine	Pinus echinata	WDH	High	74.7	664.2	5.3	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
chestnut oak	Quercus prinus	NDH	High	47.6	620.8	9.7	No change	No change	High	Abundant	Very Good	Very Good			1	7
sourwood	Oxydendrum arboreum	NDL	High	76	595.3	5.2	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	8
water oak	Quercus nigra	WDH	High	47	505.5	6.0	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	9
Virginia pine	Pinus virginiana	NDH	High	60.6	505.1	6.1	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	10
southern red oak	Quercus falcata	WDL	Medium	77	481.5	4.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
scarlet oak	Quercus coccinea	WDL	Medium	61.9	463.0	5.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
eastern white pine	Pinus strobus	WDH	High	35.3	334.3	6.5	No change	No change	Low	Common	Poor	Poor			0	13
pignut hickory	Carya glabra	WDL	Medium	74.8	319.1	2.9	No change	No change	Medium	Common	Fair	Fair			1	14
black cherry	Prunus serotina	WDL	Medium	69.3	279.8	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
blackgum	Nyssa sylvatica	WDL	Medium	71.5	265.5	2.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
black oak	Quercus velutina	WDH	High	58.5	253.0	2.6	No change	No change	Medium	Common	Fair	Fair			1	17
northern red oak	Quercus rubra	WDH	Medium	38.5	173.9	2.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	18
flowering dogwood	Cornus florida	WDL	Medium	69.1	166.3	1.7	Sm. inc.	No change	Medium	Common	Good	Fair			1	19
post oak	Quercus stellata	WDH	High	47.9	149.3	2.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
mockernut hickory	Carya alba	WDL	Medium	53.8	134.5	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
American beech	Fagus grandifolia	WDH	High	38.1	98.6	1.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	22
eastern hemlock	Tsuga canadensis	NSH	High	24.8	96.9	2.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	23
eastern redcedar	Juniperus virginiana	WDH	Medium	21.8	81.9	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
pitch pine	Pinus rigida	NSH	High	15.2	52.6	2.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	25
black locust	Robinia pseudoacacia	NDH	Low	21.5	50.5	1.5	No change	Sm. inc.	Medium	Common	Fair	Good			1	26
green ash	Fraxinus pennsylvanica	WSH	Low	20	48.8	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	27
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	16.4	48.2	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	28
river birch	Betula nigra	NSL	Low	8.2	46.0	5.0	No change	No change	Medium	Rare	Poor	Poor			1	29
winged elm	Ulmus alata	WDL	Medium	18.5	44.5	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
sycamore	Platanus occidentalis	NSL	Low	7.1	44.0	4.9	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	31
sweet birch	Betula lenta	NDH	High	19.9	41.9	1.6	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	1	32
blackjack oak	Quercus marilandica	NSL	Medium	10	34.3	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	33
common persimmon	Diospyros virginiana	NSL	Low	20.1	29.4	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	34
American holly	Ilex opaca	NSL	Medium	24.6	25.6	0.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	35
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	6.3	19.3	1.3	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	36
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	14.7	18.0	1.0	No change	No change	Low	Rare	Very Poor	Very Poor			0	37
serviceberry	Amelanchier spp.	NSL	Low	17.8	17.0	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
black willow	Salix nigra	NSH	Low	5.1	16.9	2.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	39
bitternut hickory	Carya cordiformis	WSL	Low	4.6	15.7	3.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	40
black walnut	Juglans nigra	WDH	Low	2	14.5	7.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	41
sassafras	Sassafras albidum	WSL	Low	17.1	14.2	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	42
Table Mountain pine	Pinus pungens	NSL	Low	3.9	12.6	3.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	43
swamp chestnut oak	Quercus michauxii	NSL	Low	1.2	11.9	5.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	44
cucumbertree	Magnolia acuminata	NSL	Low	7	10.4	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	45
boxelder	Acer negundo	WSH	Low	5.9	10.1	1.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	46
eastern redbud	Cercis canadensis	NSL	Low	4.9	8.3	1.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
slippery elm	Ulmus rubra	WSL	Low	3.6	7.9	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 48
white ash	Fraxinus americana	WDL	Medium	8.2	7.6	0.8	Sm. dec.	No change	Low	Rare	Very Poor	Very Poor				0 49
American basswood	Tilia americana	WSL	Medium	3.5	7.6	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 50
yellow buckeye	Aesculus flava	NSL	Low	5.3	6.4	0.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 51
red mulberry	Morus rubra	NSL	Low	2.7	5.6	0.6	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++		1 52
florida maple	Acer barbatum	NSL	Low	5.1	5.3	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++		2 53
willow oak	Quercus phellos	NSL	Low	1	4.9	5.0	No change	No change	Medium	Rare	Poor	Poor		Infill +		2 54
sand hickory	Carya pallida	NSL	FIA	2	4.5	2.3	Unknown	Unknown	NA	Rare	FIA Only	FIA Only				0 55
laurel oak	Quercus laurifolia	NDH	Medium	2	4.0	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 56
silverbell	Halesia spp.	NSL	Low	2.5	3.4	0.9	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 57
striped maple	Acer pensylvanicum	NSL	Medium	2.3	1.8	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 58
hackberry	Celtis occidentalis	WDH	Medium	1.3	1.8	0.7	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost				0 59
paulownia	Paulownia tomentosa	NSL	FIA	1	1.8	1.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 60
pecan	Carya illinoensis	NSH	Low	1	1.3	1.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +		2 61
white mulberry	Morus alba	NSL	FIA	2	1.0	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 62
American chestnut	Castanea dentata	NSLX	FIA	2.7	0.7	0.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 63
American elm	Ulmus americana	WDH	Medium	0.7	0.4	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 64
wild plum	Prunus americana	NSLX	FIA	0.2	0.4	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 65
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	0.4	0.4	No change	No change	Medium	Rare	Poor	Poor				0 66
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 67
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 68
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +			3 69
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 70
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++			3 71
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 72
black maple	Acer nigrum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 73
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 74
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 75
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 76
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3 77
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 78
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 79
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 80
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate +		3 81
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 82
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 83
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 84
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 85
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0 86
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 87
bigtooth aspen	Populus grandidentata	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 88
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 89
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 90
pin oak	Quercus palustris	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 91
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 92
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 93
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 94



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American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	95
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	96