

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 3,933.4 223

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	19	25	Increase	35	34	Very Good	16	15	Likely	0	0
Hickory	6			Medium	33	51	No Change	10	13	Good	19	21	Infill	10	10
Maple	5	Abundant	3	Low	35	13	Decrease	21	19	Fair	8	7	Migrate	6	9
Oak	14	Common	30	FIA	5		New	14	15	Poor	11	12		16	19
Pine	4	Rare	38				Unknown	12	11	Very Poor	12	10			
Other	39	Absent	20					92	92	FIA Only	2	2			
	71		91		92	89				Unknown	7	6			
											75	73			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	60.0	61.7	63.9	64.0	
Average	60.0	62.1	64.6	67.3	
GFDL45	60.0	63.0	64.7	65.5	
GFDL85	60.0	62.5	65.8	69.2	
HAD45	60.0	62.3	65.3	66.6	
HAD85	60.0	62.7	67.1	70.8	
Growing Season	74.2	75.8	77.7	78.3	
May—Sep	74.2	76.1	78.8	82.3	
GFDL45	74.2	77.6	79.4	80.8	
GFDL85	74.2	76.9	80.8	84.7	
HAD45	74.2	77.5	80.3	81.8	
HAD85	74.2	77.7	84.1	87.5	
Coldest Month	38.6	40.7	41.7	41.8	
Average	38.6	41.4	42.5	43.7	
GFDL45	38.6	42.1	42.2	42.5	
GFDL85	38.6	40.3	41.5	41.9	
HAD45	38.6	38.5	40.5	41.0	
HAD85	38.6	39.9	41.3	42.9	
Warmest Month	79.1	80.7	81.6	81.7	
Average	79.1	80.8	82.4	84.2	
GFDL45	79.1	81.8	83.0	84.0	
GFDL85	79.1	81.8	84.0	85.9	
HAD45	79.1	83.5	85.8	86.3	
HAD85	79.1	84.1	88.6	89.9	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	55.2	57.3	61.3	60.0	
Total	55.2	58.9	60.2	66.0	
GFDL45	55.2	62.4	65.1	68.4	
GFDL85	55.2	62.4	64.9	68.3	
HAD45	55.2	53.1	59.2	59.9	
HAD85	55.2	57.4	51.7	57.4	
Growing Season	21.3	21.5	21.8	22.5	
May—Sep	21.3	21.4	20.7	22.7	
GFDL45	21.3	25.7	26.8	27.3	
GFDL85	21.3	25.8	27.2	28.6	
HAD45	21.3	20.2	21.8	21.0	
HAD85	21.3	22.3	16.3	18.5	

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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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
loblolly pine	Pinus taeda	WDH	High	66.5	1434.4	17.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	75	773.3	9.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	63.1	697.1	10.0	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
white oak	Quercus alba	WDH	Medium	62.2	427.9	6.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	4
red maple	Acer rubrum	WDH	High	64.1	374.9	5.0	No change	No change	High	Common	Good	Good			1	5
chestnut oak	Quercus prinus	NDH	High	42.3	371.0	6.9	Sm. inc.	No change	High	Common	Very Good	Good			1	6
pignut hickory	Carya glabra	WDL	Medium	69.4	347.6	4.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	7
eastern redcedar	Juniperus virginiana	WDH	Medium	45.3	302.2	5.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
southern red oak	Quercus falcata	WDL	Medium	40.8	300.3	5.9	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
mockernut hickory	Carya alba	WDL	Medium	47.4	256.8	4.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
Virginia pine	Pinus virginiana	NDH	High	16.7	244.6	9.3	No change	No change	Medium	Common	Fair	Fair			1	11
shagbark hickory	Carya ovata	WSL	Medium	41.6	239.1	5.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
winged elm	Ulmus alata	WDL	Medium	57.3	207.9	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
blackgum	Nyssa sylvatica	WDL	Medium	54.6	201.3	3.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
black cherry	Prunus serotina	WDL	Medium	54.7	184.3	3.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	15
white ash	Fraxinus americana	WDL	Medium	33.6	183.9	5.5	Sm. dec.	No change	Low	Common	Poor	Poor			0	16
water oak	Quercus nigra	WDH	High	35.1	181.8	5.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
chinkapin oak	Quercus muehlenbergii	NSL	Medium	30.2	174.0	4.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	18
florida maple	Acer barbatum	NSL	Low	32.2	171.0	4.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	19
northern red oak	Quercus rubra	WDH	Medium	40.7	163.0	3.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	20
post oak	Quercus stellata	WDH	High	45.6	149.8	3.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
black oak	Quercus velutina	WDH	High	37	142.5	3.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	22
shortleaf pine	Pinus echinata	WDH	High	25.6	138.3	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
scarlet oak	Quercus coccinea	WDL	Medium	39.5	121.3	3.1	No change	No change	Medium	Common	Fair	Fair			1	24
sourwood	Oxydendrum arboreum	NDL	High	37.3	105.2	2.5	No change	No change	High	Common	Good	Good			1	25
black willow	Salix nigra	NSH	Low	9.8	89.2	9.0	No change	No change	Low	Common	Poor	Poor			0	26
green ash	Fraxinus pennsylvanica	WSH	Low	33.3	86.3	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	19.9	85.4	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	28
flowering dogwood	Cornus florida	WDL	Medium	40	71.3	1.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	29
willow oak	Quercus phellos	NSL	Low	8.4	68.3	7.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	30
sugarberry	Celtis laevigata	NDH	Medium	19	67.9	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	31
common persimmon	Diospyros virginiana	NSL	Low	35.8	66.4	1.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
hackberry	Celtis occidentalis	WDH	Medium	18.4	63.4	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	33
sassafras	Sassafras albidum	WSL	Low	29.6	48.1	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	34
black locust	Robinia pseudoacacia	NDH	Low	14.2	43.9	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
sugar maple	Acer saccharum	WDH	High	16	43.0	2.4	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		1	36
eastern redbud	Cercis canadensis	NSL	Low	26.8	36.9	1.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	37
black walnut	Juglans nigra	WDH	Low	15.2	33.9	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
American beech	Fagus grandifolia	WDH	High	22.5	33.2	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	39
honeylocust	Gleditsia triacanthos	NSH	Low	12.1	32.9	3.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	40
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	16.9	32.9	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	41
American elm	Ulmus americana	WDH	Medium	20.7	32.1	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	42
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	25.5	29.3	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	43
slippery elm	Ulmus rubra	WSL	Low	22.7	28.0	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	44
longleaf pine	Pinus palustris	NSH	Medium	2	27.4	14.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	45
sycamore	Platanus occidentalis	NSL	Low	4.8	27.4	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	46
boxelder	Acer negundo	WSH	Low	10.2	24.5	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	47

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Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	2.8	23.8	8.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +		2 48
cucumber tree	<i>Magnolia acuminata</i>	NSL	Low	5.9	16.4	2.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +		2 49
American basswood	<i>Tilia americana</i>	WSL	Medium	9	16.1	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 50
yellow buckeye	<i>Aesculus flava</i>	NSL	Low	10.2	13.7	1.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor				0 51
red mulberry	<i>Morus rubra</i>	NSL	Low	9.9	12.3	1.3	No change	No change	Medium	Rare	Poor	Poor				1 52
blackjack oak	<i>Quercus marilandica</i>	NSL	Medium	0.6	9.1	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 53
water tupelo	<i>Nyssa aquatica</i>	NSH	Medium	1	9.0	9.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 54
white mulberry	<i>Morus alba</i>	NSL	FIA	1.7	7.6	1.6	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 55
butternut	<i>Juglans cinerea</i>	NSLX	FIA	5.3	6.7	0.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only				0 56
river birch	<i>Betula nigra</i>	NSL	Low	2.9	6.3	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++		2 57
bald cypress	<i>Taxodium distichum</i>	NSH	Medium	1	5.5	5.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 58
shellbark hickory	<i>Carya laciniosa</i>	NSL	Low	5.4	4.7	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor				0 59
blue ash	<i>Fraxinus quadrangulata</i>	NSL	Low	1.4	4.3	0.6	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor				0 60
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	2.9	3.7	1.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +		2 61
serviceberry	<i>Amelanchier spp.</i>	NSL	Low	1.8	2.5	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 62
paulownia	<i>Paulownia tomentosa</i>	NSL	FIA	1.1	1.7	0.5	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 63
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	1.8	1.7	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 64
pawpaw	<i>Asimina triloba</i>	NSL	Low	2	1.3	0.6	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost				0 65
ailanthus	<i>Ailanthus altissima</i>	NSL	FIA	8.8	1.2	1.1	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 66
wild plum	<i>Prunus americana</i>	NSLX	FIA	2.8	1.2	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 67
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum ssp.</i>	NSL	Low	1	1.1	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 68
silver maple	<i>Acer saccharinum</i>	NSH	Low	1.3	1.0	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor				0 69
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	1	0.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 70
water hickory	<i>Carya aquatica</i>	NSL	Medium	0.3	0.4	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0 71
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 72
slash pine	<i>Pinus elliotii</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 73
spruce pine	<i>Pinus glabra</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 74
striped maple	<i>Acer pensylvanicum</i>	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				3 75
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 76
Ohio buckeye	<i>Aesculus glabra</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 77
yellow birch	<i>Betula alleghaniensis</i>	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 78
sweet birch	<i>Betula lenta</i>	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 79
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 80
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 81
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3 82
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 83
American holly	<i>Ilex opaca</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 84
southern magnolia	<i>Magnolia grandiflora</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +			3 85
sweetbay	<i>Magnolia virginiana</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 86
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0 87
swamp tupelo	<i>Nyssa biflora</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +		3 88
bur oak	<i>Quercus macrocarpa</i>	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown				0 89
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3 90
bluejack oak	<i>Quercus incana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3 91
cedar elm	<i>Ulmus crassifolia</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++		3 92