

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 10,066 3,886.5 212

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	20	25	Increase	32	33	Very Good	18	22	Likely	1	1
Hickory	4			Medium	28	48	No Change	9	11	Good	14	12	Infill	6	7
Maple	5	Abundant	3	Low	35	13	Decrease	24	21	Fair	11	11	Migrate	2	5
Oak	15	Common	39	FIA	6		New	11	12	Poor	10	9			
Pine	5	Rare	29				Unknown	13	12	Very Poor	12	11			
Other	39	Absent	16							FIA Only	3	3			
	71		87		89	86		89	89	Unknown	7	6		9	13
											75	74			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	58.4	60.2	62.4	62.6	
Average	58.4	60.5	63.2	66.0	
	58.4	61.4	63.2	64.0	
	58.4	61.0	64.3	67.8	
	58.4	60.8	63.9	65.2	
	58.4	61.2	65.7	69.5	
Growing Season	73.0	74.7	76.7	77.2	
	73.0	75.0	77.8	81.5	
May—Sep	73.0	76.4	78.5	79.8	
	73.0	75.9	80.0	83.9	
	73.0	76.3	79.3	80.8	
	73.0	76.6	83.2	86.6	
Coldest Month	36.2	38.2	39.5	39.6	
Average	36.2	39.2	40.3	41.8	
	36.2	39.7	39.7	40.0	
	36.2	37.7	38.9	39.3	
	36.2	36.2	38.4	38.8	
	36.2	37.6	39.3	40.9	
Warmest Month	78.1	79.7	80.7	80.8	
Average	78.1	79.9	81.6	83.4	
	78.1	80.9	82.3	83.2	
	78.1	81.1	83.5	85.5	
	78.1	82.5	85.1	85.6	
	78.1	83.6	88.2	89.6	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	54.3	56.4	61.4	59.1	
Total	54.3	59.8	60.4	65.3	
	54.3	61.7	64.1	67.8	
	54.3	61.8	64.9	68.2	
	54.3	51.7	57.1	57.4	
	54.3	54.8	50.3	55.7	
Growing Season	21.6	21.2	22.2	22.0	
May—Sep	21.6	22.3	20.5	22.5	
	21.6	25.3	25.9	26.7	
	21.6	25.5	26.4	27.4	
	21.6	20.4	20.8	20.4	
	21.6	21.6	16.3	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-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
eastern redcedar	Juniperus virginiana	WDH	Medium	74.5	1420.6	17.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
hackberry	Celtis occidentalis	WDH	Medium	65.6	583.7	8.1	No change	No change	High	Abundant	Very Good	Very Good			1	2
shagbark hickory	Carya ovata	WSL	Medium	58.2	521.8	8.8	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	3
white ash	Fraxinus americana	WDL	Medium	61.4	417.5	6.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	4
sugar maple	Acer saccharum	WDH	High	56.6	380.3	6.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	5
winged elm	Ulmus alata	WDL	Medium	66.9	370.1	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
sassafras	Sassafras albidum	WSL	Low	38	359.7	8.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	7
white oak	Quercus alba	WDH	Medium	31.4	320.1	7.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	8
yellow-poplar	Liriodendron tulipifera	WDH	High	34.2	273.2	6.3	No change	No change	High	Common	Good	Good			1	9
chinkapin oak	Quercus muehlenbergii	NSL	Medium	57.1	270.1	3.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
Osage-orange	Maclura pomifera	NDH	Medium	28.2	239.8	6.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
black locust	Robinia pseudoacacia	NDH	Low	45.2	238.7	4.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	12
sweetgum	Liquidambar styraciflua	WDH	High	22.9	233.5	7.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	13
American elm	Ulmus americana	WDH	Medium	50.4	230.7	3.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	14
scarlet oak	Quercus coccinea	WDL	Medium	36.9	219.9	5.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	15
loblolly pine	Pinus taeda	WDH	High	10.2	205.7	15.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	16
sugarberry	Celtis laevigata	NDH	Medium	34	192.6	4.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
black walnut	Juglans nigra	WDH	Low	51.3	190.1	3.3	No change	No change	Medium	Common	Fair	Fair			1	18
post oak	Quercus stellata	WDH	High	24.4	183.3	7.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	19
red maple	Acer rubrum	WDH	High	21	179.5	5.3	No change	Sm. inc.	High	Common	Good	Very Good			1	20
southern red oak	Quercus falcata	WDL	Medium	14.5	178.8	8.4	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
ailanthus	Ailanthus altissima	NSL	FIA	23.2	156.0	5.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	22
pignut hickory	Carya glabra	WDL	Medium	43	153.2	3.4	No change	No change	Medium	Common	Fair	Fair			1	23
green ash	Fraxinus pennsylvanica	WSH	Low	35.3	142.7	3.5	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
boxelder	Acer negundo	WSH	Low	25.8	129.2	3.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
black cherry	Prunus serotina	WDL	Medium	25.9	126.8	3.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	26
mockernut hickory	Carya alba	WDL	Medium	23.4	122.5	4.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
chestnut oak	Quercus prinus	NDH	High	18.1	120.7	6.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	28
blue ash	Fraxinus quadrangulata	NSL	Low	23.1	118.7	4.7	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	29
northern red oak	Quercus rubra	WDH	Medium	31	118.0	3.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	30
flowering dogwood	Cornus florida	WDL	Medium	27.2	107.0	1.7	No change	No change	Medium	Common	Fair	Fair			1	31
blackgum	Nyssa sylvatica	WDL	Medium	20.2	95.9	2.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
common persimmon	Diospyros virginiana	NSL	Low	32.6	86.5	1.6	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	33
honeylocust	Gleditsia triacanthos	NSH	Low	22.2	84.5	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	34
sourwood	Oxydendrum arboreum	NDL	High	19.4	84.3	2.8	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	35
black oak	Quercus velutina	WDH	High	25.3	83.3	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	36
bitternut hickory	Carya cordiformis	WSL	Low	19.7	73.6	2.3	Sm. dec.	No change	High	Common	Fair	Good			1	37
American beech	Fagus grandifolia	WDH	High	15.4	72.3	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	38
slippery elm	Ulmus rubra	WSL	Low	32.7	70.0	2.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	39
sycamore	Platanus occidentalis	NSL	Low	12	64.2	3.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	40
eastern redbud	Cercis canadensis	NSL	Low	41.5	60.4	1.6	Sm. dec.	No change	Medium	Common	Poor	Fair			1	41
Shumard oak	Quercus shumardii	NSL	Low	12.2	56.5	3.3	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	42
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	26.2	46.7	1.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	43
willow oak	Quercus phellos	NSL	Low	6.7	41.4	5.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	44
silver maple	Acer saccharinum	NSH	Low	0.1	32.4	2.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	45
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	13.2	30.2	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	46
American basswood	Tilia americana	WSL	Medium	7.4	21.9	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

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USDA Forest Service
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
red mulberry	Morus rubra	NSL	Low	13.4	19.8	1.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	48
yellow buckeye	Aesculus flava	NSL	Low	7.6	14.3	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	49
florida maple	Acer barbatum	NSL	Low	5	12.2	3.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	50
water oak	Quercus nigra	WDH	High	5.4	11.9	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	51
pawpaw	Asimina triloba	NSL	Low	4.8	9.2	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
eastern cottonwood	Populus deltoides	NSH	Low	0.1	8.9	0.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
paulownia	Paulownia tomentosa	NSL	FIA	2.5	8.1	1.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
black willow	Salix nigra	NSH	Low	1.1	7.5	1.7	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	2	55
pitch pine	Pinus rigida	NSH	High	0.1	6.3	0.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	56
pin oak	Quercus palustris	NSH	Low	1	5.8	5.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	57
white mulberry	Morus alba	NSL	FIA	2	5.6	2.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	58
river birch	Betula nigra	NSL	Low	3	5.5	1.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	59
serviceberry	Amelanchier spp.	NSL	Low	2.8	5.0	1.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	60
wild plum	Prunus americana	NSLX	FIA	0.5	4.3	0.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	61
butternut	Juglans cinerea	NSLX	FIA	1	3.7	3.8	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	62
eastern white pine	Pinus strobus	WDH	High	1.6	2.7	4.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	63
Virginia pine	Pinus virginiana	NDH	High	1	2.7	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	64
blackjack oak	Quercus marilandica	NSL	Medium	1	2.2	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	65
American chestnut	Castanea dentata	NSLX	FIA	1	2.1	2.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	66
shortleaf pine	Pinus echinata	WDH	High	0.6	1.5	0.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	67
Ohio buckeye	Aesculus glabra	NSL	Low	1	1.0	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	68
laurel oak	Quercus laurifolia	NDH	Medium	1.6	1.0	1.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	69
pin cherry	Prunus pensylvanica	NSL	Low	0.8	0.5	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	70
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	2	0.4	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	71
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	72
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	74
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	75
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	76
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	77
sweet birch	Betula lenta	NDH	High	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	78
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	79
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	80
black hickory	Carya texana	NDL	High	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	Unknown	Low	Absent	New Habitat	Unknown			3	82
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	83
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	84
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	85
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	86
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown			0	87
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	88
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	89