

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

Area of Region sq. km sq. mi FIA Plots
 10,188 3,933.4 309

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	17	24	Increase	32	37	Very Good	14	15	Likely	2	2
Hickory	8			Medium	34	54	No Change	21	17	Good	16	19	Infill	16	18
Maple	4	Abundant	3	Low	37	12	Decrease	21	20	Fair	14	13	Migrate	3	2
Oak	19	Common	24	FIA	4		New	9	9	Poor	13	12			
Pine	6	Rare	51				Unknown	9	9	Very Poor	15	13			
Other	39	Absent	14							FIA Only	3	3			
	78		92		92	90		92	92	Unknown	5	5			
											80	80			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	62.0	63.8	65.8	65.9	
	CCSM85	62.0	64.1	66.5	69.3	
	GFDL45	62.0	64.9	66.8	67.6	
	GFDL85	62.0	64.8	68.0	71.6	
	HAD45	62.0	64.2	67.1	68.5	
	HAD85	62.0	64.5	68.4	72.5	
Growing Season (May—Sep)	CCSM45	75.7	77.4	79.2	79.6	
	CCSM85	75.7	77.5	80.1	83.6	
	GFDL45	75.7	78.9	80.8	82.2	
	GFDL85	75.7	78.8	82.2	86.4	
	HAD45	75.7	78.7	81.3	83.0	
	HAD85	75.7	78.7	83.9	88.2	
Coldest Month (Average)	CCSM45	41.6	44.0	44.8	44.7	
	CCSM85	41.6	43.8	44.9	46.1	
	GFDL45	41.6	44.6	44.9	45.5	
	GFDL85	41.6	43.6	44.5	45.3	
	HAD45	41.6	41.9	43.7	44.1	
	HAD85	41.6	42.7	43.7	45.3	
Warmest Month (Average)	CCSM45	80.7	82.6	83.7	83.7	
	CCSM85	80.7	82.9	84.4	86.1	
	GFDL45	80.7	83.2	84.1	85.1	
	GFDL85	80.7	83.7	85.4	87.8	
	HAD45	80.7	84.1	85.6	86.3	
	HAD85	80.7	84.6	87.8	90.2	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.4	48.9	50.4	52.8	
	CCSM85	44.4	48.9	51.9	58.2	
	GFDL45	44.4	49.6	53.8	56.6	
	GFDL85	44.4	49.1	55.8	56.0	
	HAD45	44.4	45.9	48.2	48.1	
	HAD85	44.4	48.8	44.6	46.2	
Growing Season (May—Sep)	CCSM45	20.5	24.1	25.2	26.6	
	CCSM85	20.5	23.1	24.7	27.8	
	GFDL45	20.5	24.9	27.8	28.9	
	GFDL85	20.5	24.2	29.7	29.9	
	HAD45	20.5	20.9	21.5	21.6	
	HAD85	20.5	22.8	19.2	18.2	

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	90.5	4178.7	37.6	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	86.4	1190.6	10.9	No change	No change	Medium	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	80.6	576.5	5.7	No change	No change	High	Abundant	Very Good	Very Good			1	3
water oak	Quercus nigra	WDH	High	70.1	490.7	5.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	4
longleaf pine	Pinus palustris	NSH	Medium	22.3	450.4	17.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
yellow-poplar	Liriodendron tulipifera	WDH	High	52.1	369.6	5.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	6
white oak	Quercus alba	WDH	Medium	50.9	242.4	4.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
shortleaf pine	Pinus echinata	WDH	High	38.4	238.4	5.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
black cherry	Prunus serotina	WDL	Medium	58	202.7	2.9	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	9
eastern redcedar	Juniperus virginiana	WDH	Medium	43.4	201.5	3.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	10
post oak	Quercus stellata	WDH	High	49.7	179.8	3.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
turkey oak	Quercus laevis	NSH	Medium	19.4	173.3	8.4	No change	No change	High	Common	Good	Good			1	12
southern red oak	Quercus falcata	WDL	Medium	48.6	145.6	2.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
swamp tupelo	Nyssa biflora	NDH	Medium	20.3	143.8	6.1	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	14
mockernut hickory	Carya alba	WDL	Medium	47.8	117.5	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
willow oak	Quercus phellos	NSL	Low	35.1	115.7	2.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	16
green ash	Fraxinus pennsylvanica	WSH	Low	22	110.6	4.4	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	17
flowering dogwood	Cornus florida	WDL	Medium	53.8	102.6	1.5	No change	No change	Medium	Common	Fair	Fair			1	18
winged elm	Ulmus alata	WDL	Medium	42	96.6	2.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
slash pine	Pinus elliottii	NDH	High	12.7	93.0	9.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
blackgum	Nyssa sylvatica	WDL	Medium	45.5	74.8	1.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
American elm	Ulmus americana	WDH	Medium	26.5	73.4	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
sourwood	Oxydendrum arboreum	NDL	High	26.3	68.4	1.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	23
sweetbay	Magnolia virginiana	NSL	Medium	17.2	68.0	2.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	24
Virginia pine	Pinus virginiana	NDH	High	15.9	61.0	2.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	25
American holly	Ilex opaca	NSL	Medium	34.3	52.5	1.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	26
blackjack oak	Quercus marilandica	NSL	Medium	20.1	51.1	2.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	27
pignut hickory	Carya glabra	WDL	Medium	24.4	49.3	2.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	28
scarlet oak	Quercus coccinea	WDL	Medium	19.8	47.4	2.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	29
laurel oak	Quercus laurifolia	NDH	Medium	11.6	46.1	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
common persimmon	Diospyros virginiana	NSL	Low	28.2	44.9	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	31
pond pine	Pinus serotina	NSH	Medium	7.1	43.4	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	32
American hornbeam; muscley	Carpinus caroliniana	WSL	Low	22.8	43.1	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	33
sugarberry	Celtis laevigata	NDH	Medium	12	39.1	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	34
black oak	Quercus velutina	WDH	High	24.1	34.6	1.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	35
northern red oak	Quercus rubra	WDH	Medium	24.2	33.6	1.2	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	36
river birch	Betula nigra	NSL	Low	3.9	30.5	4.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	37
water tupelo	Nyssa aquatica	NSH	Medium	2.3	29.6	5.8	No change	No change	Low	Rare	Very Poor	Very Poor			2	38
bald cypress	Taxodium distichum	NSH	Medium	0.5	27.6	3.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	39
white ash	Fraxinus americana	WDL	Medium	11.9	24.6	1.5	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair	Infill +	Infill +	1	40
redbay	Persea borbonia	NSL	Low	10.1	23.1	1.6	No change	No change	High	Rare	Fair	Fair			1	41
sycamore	Platanus occidentalis	NSL	Low	5.1	21.1	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	42
shagbark hickory	Carya ovata	WSL	Medium	8.1	20.7	1.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
bitternut hickory	Carya cordiformis	WSL	Low	7.7	19.6	2.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	44
sand hickory	Carya pallida	NSL	FIA	7.2	18.8	1.4	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	45
boxelder	Acer negundo	WSH	Low	7.8	15.0	2.2	No change	No change	High	Rare	Fair	Fair			1	46
eastern redbud	Cercis canadensis	NSL	Low	7.4	14.9	1.9	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	5.6	12.0	1.4	No change	No change	Medium	Rare	Poor	Poor		Infill +	1	48
eastern hophornbeam; ironw	Ostrya virginiana	NSL	Low	5.5	10.9	1.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	49
swamp chestnut oak	Quercus michauxii	NSL	Low	6.9	10.8	1.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	50
overcup oak	Quercus lyrata	NSL	Medium	2.3	10.8	3.5	No change	No change	Low	Rare	Very Poor	Very Poor			2	51
slippery elm	Ulmus rubra	WSL	Low	9.7	9.9	0.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	52
American beech	Fagus grandifolia	WDH	High	6.3	9.2	1.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	53
live oak	Quercus virginiana	NDH	High	0.3	8.6	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
bluejack oak	Quercus incana	NSL	Low	5.6	8.5	1.4	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	55
sassafras	Sassafras albidum	WSL	Low	16	7.6	0.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	56
water elm	Planera aquatica	NSL	Low	1.3	5.6	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	57
black willow	Salix nigra	NSH	Low	7.1	4.8	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	58
honeylocust	Gleditsia triacanthos	NSH	Low	2.9	4.7	1.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	59
florida maple	Acer barbatum	NSL	Low	3.4	4.4	1.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	60
black walnut	Juglans nigra	WDH	Low	4.6	3.8	0.6	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	61
pecan	Carya illinoensis	NSH	Low	1	3.2	3.3	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	62
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	7.9	2.5	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	63
water hickory	Carya aquatica	NSL	Medium	4.9	2.5	1.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	64
shellbark hickory	Carya laciniosa	NSL	Low	0.7	1.8	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	65
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0.2	1.6	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	66
eastern cottonwood	Populus deltoides	NSH	Low	4.9	1.5	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	67
black locust	Robinia pseudoacacia	NDH	Low	4	1.3	1.3	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	68
wild plum	Prunus americana	NSLX	FIA	1	1.1	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	69
American basswood	Tilia americana	WSL	Medium	0.5	0.9	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	70
cucumbertree	Magnolia acuminata	NSL	Low	1.8	0.8	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	71
white mulberry	Morus alba	NSL	FIA	1	0.6	0.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	72
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	1	0.6	0.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	73
pawpaw	Asimina triloba	NSL	Low	4.9	0.6	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	74
chestnut oak	Quercus prinus	NDH	High	0.5	0.4	0.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	75
sugar maple	Acer saccharum	WDH	High	1	0.3	0.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	76
Shumard oak	Quercus shumardii	NSL	Low	1	0.2	0.2	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	77
serviceberry	Amelanchier spp.	NSL	Low	3.5	0.1	0.4	No change	No change	Medium	Rare	Poor	Poor			0	78
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	79
spruce pine	Pinus glabra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	80
pond cypress	Taxodium ascendens	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	81
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	83
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	84
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	85
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	86
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	87
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	88
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	89
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	90
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	91
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	92

