

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
 10,066 3,886.5 72

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	16	24	Increase	30	31	Very Good	4	4	Likely	1	1
Hickory	7			Medium	32	48	No Change	15	14	Good	16	20	Infill	45	43
Maple	5	Abundant	0	Low	31	9	Decrease	16	16	Fair	17	14	Migrate	3	5
Oak	15	Common	15	FIA	3		New	14	14	Poor	15	15			
Pine	2	Rare	49				Unknown	7	7	Very Poor	8	7			
Other	33	Absent	16							FIA Only	2	2			
	64		80		82	81		82	82	Unknown	4	4			
											66	66			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	60.8	62.6	64.6	64.9	
Average	60.8	62.9	65.5	68.3	
GFDL45	60.8	66.0	65.7	66.6	
GFDL85	60.8	63.6	66.6	70.2	
HAD45	60.8	63.4	66.4	67.7	
HAD85	60.8	63.7	68.3	72.1	
Growing Season	76.4	78.1	79.7	80.3	
May—Sep	76.4	78.7	81.2	84.9	
GFDL45	76.4	83.0	82.1	83.7	
GFDL85	76.4	79.9	83.5	87.9	
HAD45	76.4	79.8	82.7	84.1	
HAD85	76.4	80.1	86.6	90.0	
Coldest Month	36.8	39.0	40.3	40.6	
Average	36.8	39.3	40.4	42.1	
GFDL45	36.8	40.7	40.8	41.0	
GFDL85	36.8	38.4	39.7	40.3	
HAD45	36.8	37.8	39.8	40.0	
HAD85	36.8	39.0	40.8	42.5	
Warmest Month	81.9	83.4	84.5	84.7	
Average	81.9	84.3	85.3	87.2	
GFDL45	81.9	86.1	86.7	87.8	
GFDL85	81.9	85.7	87.3	90.2	
HAD45	81.9	86.0	88.0	88.5	
HAD85	81.9	87.2	91.2	92.5	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	48.7	48.9	54.3	51.8	
Total	48.7	51.3	53.4	55.0	
GFDL45	48.7	54.4	57.9	57.7	
GFDL85	48.7	54.6	59.1	61.3	
HAD45	48.7	46.7	51.7	53.1	
HAD85	48.7	50.9	45.6	50.4	
Growing Season	17.7	16.8	17.6	17.1	
May—Sep	17.7	17.3	16.1	16.6	
GFDL45	17.7	19.9	20.3	20.9	
GFDL85	17.7	20.8	22.1	22.5	
HAD45	17.7	15.7	16.3	15.2	
HAD85	17.7	16.8	12.5	12.5	

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
boxelder	Acer negundo	WSH	Low	29.9	206.0	14.8	Lg. dec.	Lg. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
sweetgum	Liquidambar styraciflua	WDH	High	24.2	204.4	10.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	2
green ash	Fraxinus pennsylvanica	WSH	Low	50.8	178.7	8.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	17.9	133.3	8.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	4
black hickory	Carya texana	NDL	High	20.3	116.5	11.4	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	5
black willow	Salix nigra	NSH	Low	27.8	111.1	13.0	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	6
sugarberry	Celtis laevigata	NDH	Medium	42.2	98.8	13.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	7
winged elm	Ulmus alata	WDL	Medium	30.5	97.4	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
loblolly pine	Pinus taeda	WDH	High	6.4	95.8	35.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			2	9
white oak	Quercus alba	WDH	Medium	33.9	89.3	5.9	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	10
overcup oak	Quercus lyrata	NSL	Medium	25.8	76.7	7.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	2	11
willow oak	Quercus phellos	NSL	Low	25.6	61.1	5.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	2	12
red maple	Acer rubrum	WDH	High	24.4	57.9	3.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	13
water tupelo	Nyssa aquatica	NSH	Medium	11.4	52.9	10.5	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor		Infill +	2	14
American elm	Ulmus americana	WDH	Medium	46.2	51.3	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
nuttall oak	Quercus texana	NSH	Medium	13.2	46.7	4.8	No change	No change	High	Rare	Fair	Fair			0	16
yellow-poplar	Liriodendron tulipifera	WDH	High	3	43.5	6.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	17
slippery elm	Ulmus rubra	WSL	Low	28.4	41.7	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	18
sycamore	Platanus occidentalis	NSL	Low	21.7	41.0	7.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	19
bald cypress	Taxodium distichum	NSH	Medium	11.4	40.5	11.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	20
black cherry	Prunus serotina	WDL	Medium	14.8	39.3	6.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	21
pignut hickory	Carya glabra	WDL	Medium	11	36.7	4.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	22
southern red oak	Quercus falcata	WDL	Medium	18.7	33.7	6.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	23
common persimmon	Diospyros virginiana	NSL	Low	38.2	33.0	1.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	24
post oak	Quercus stellata	WDH	High	23.3	32.5	6.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	25
water elm	Planera aquatica	NSL	Low	14	31.9	4.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	26
mockernut hickory	Carya alba	WDL	Medium	18.4	31.3	2.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	10.4	30.1	4.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	28
shortleaf pine	Pinus echinata	WDH	High	3.7	28.4	7.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
water hickory	Carya aquatica	NSL	Medium	18.6	27.8	5.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	30
blackgum	Nyssa sylvatica	WDL	Medium	20.1	27.5	2.8	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	31
water oak	Quercus nigra	WDH	High	15	23.5	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	32
American beech	Fagus grandifolia	WDH	High	4.9	22.7	4.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
black oak	Quercus velutina	WDH	High	3.9	20.5	4.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
northern red oak	Quercus rubra	WDH	Medium	7.7	20.0	4.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	35
shagbark hickory	Carya ovata	WDL	Medium	14.5	19.3	4.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	36
hackberry	Celtis occidentalis	WDH	Medium	11.7	19.1	6.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	37
sugar maple	Acer saccharum	WDH	High	2.4	17.5	3.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	38
florida maple	Acer barbatum	NSL	Low	10.1	17.4	9.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	39
pecan	Carya illinoensis	NSH	Low	19.4	17.3	2.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	40
eastern cottonwood	Populus deltoides	NSH	Low	11.9	13.6	6.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	41
sassafras	Sassafras albidum	WSL	Low	13.8	12.0	1.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	42
silver maple	Acer saccharinum	NSH	Low	6.6	8.9	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	43
flowering dogwood	Cornus florida	WDL	Medium	8.7	8.3	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	44
swamp tupelo	Nyssa biflora	NDH	Medium	1	6.8	6.8	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	45
red mulberry	Morus rubra	NSL	Low	6.9	5.4	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	46
river birch	Betula nigra	NSL	Low	7.9	5.2	10.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	47

One x One Degree
Climate Change Atlas Tree Species

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
honeylocust	Gleditsia triacanthos	NSH	Low	15.1	4.6	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	48
waterlocust	Gleditsia aquatica	NSLX	FIA	8.3	4.6	1.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
chinkapin oak	Quercus muehlenbergii	NSL	Medium	8.5	4.5	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
black walnut	Juglans nigra	WDH	Low	6.4	4.3	1.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	51
eastern redcedar	Juniperus virginiana	WDH	Medium	4.3	4.0	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	52
Shumard oak	Quercus shumardii	NSL	Low	12.1	3.9	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	53
white ash	Fraxinus americana	WDL	Medium	7.8	3.9	0.9	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	54
swamp chestnut oak	Quercus michauxii	NSL	Low	5.2	3.2	0.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	55
blackjack oak	Quercus marilandica	NSL	Medium	5.8	2.9	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	56
eastern redbud	Cercis canadensis	NSL	Low	9.8	2.6	2.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	57
bitternut hickory	Carya cordiformis	WSL	Low	6.6	1.5	0.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	58
pawpaw	Asimina triloba	NSL	Low	3.8	1.1	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	59
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	4.8	0.9	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	60
black locust	Robinia pseudoacacia	NDH	Low	1.4	0.5	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	61
ailanthus	Ailanthus altissima	NSL	FIA	5.4	0.4	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	62
northern catalpa	Catalpa speciosa	NSHX	FIA	4	0.2	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
scarlet oak	Quercus coccinea	WDL	Medium	1.4	0.2	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	65
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	66
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	67
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	68
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	71
American holly	Ilex opaca	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	72
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	73
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	74
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	77
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
laurel oak	Quercus laurifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
chestnut oak	Quercus prinus	NDH	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	80
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	81
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	82