

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 3,886.5 223

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	2		High	20	Increase	25	29	Very Good	8	13	Likely	2	2
Hickory	6		Medium	29	No Change	12	10	Good	19	19	Infill	8	6
Maple	6	Abundant	Low	33	Decrease	27	25	Fair	11	8	Migrate	3	3
Oak	14	Common	FIA	4	New	12	12	Poor	12	10			
Pine	5	Rare			Unknown	10	10	Very Poor	9	10			
Other	35	Absent						FIA Only	2	2			
	68	86		86	84	86	86	Unknown	6	6		13	11
									67	68			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	59.7	61.5	63.6	63.7	
	CCSM85	59.7	61.9	64.3	67.2	
	GFDL45	59.7	62.8	64.8	65.6	
	GFDL85	59.7	62.7	65.9	69.7	
	HAD45	59.7	62.0	65.0	66.4	
HAD85	59.7	62.3	66.3	70.5		
Growing Season (May—Sep)	CCSM45	74.0	75.8	77.6	78.1	
	CCSM85	74.0	76.0	78.5	82.2	
	GFDL45	74.0	77.5	79.5	80.9	
	GFDL85	74.0	77.4	81.0	85.3	
	HAD45	74.0	77.0	79.8	81.4	
HAD85	74.0	77.0	82.4	86.9		
Coldest Month Average	CCSM45	38.7	41.0	41.8	41.9	
	CCSM85	38.7	41.1	42.1	43.2	
	GFDL45	38.7	42.0	42.2	43.0	
	GFDL85	38.7	40.8	41.8	42.7	
	HAD45	38.7	39.2	41.0	41.3	
HAD85	38.7	39.9	41.0	42.6		
Warmest Month Average	CCSM45	79.2	81.2	82.3	82.3	
	CCSM85	79.2	81.4	83.0	84.7	
	GFDL45	79.2	82.1	83.2	84.2	
	GFDL85	79.2	82.7	84.7	87.2	
	HAD45	79.2	82.6	84.4	85.1	
HAD85	79.2	83.3	86.6	89.2		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.5	48.6	51.0	52.6	
	CCSM85	44.5	49.2	52.1	57.6	
	GFDL45	44.5	49.6	53.5	56.3	
	GFDL85	44.5	48.7	54.9	55.3	
	HAD45	44.5	46.8	48.3	48.5	
HAD85	44.5	48.9	45.5	47.4		
Growing Season (May—Sep)	CCSM45	19.9	23.0	24.5	25.8	
	CCSM85	19.9	22.6	23.5	26.3	
	GFDL45	19.9	23.5	26.1	27.1	
	GFDL85	19.9	22.4	27.3	27.4	
	HAD45	19.9	20.5	20.6	21.4	
HAD85	19.9	22.5	19.6	19.2		

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
sweetgum	Liquidambar styraciflua	WDH	High	84.5	1157.7	11.0	No change	No change	Medium	Abundant	Good	Good			1	1
loblolly pine	Pinus taeda	WDH	High	41.2	948.5	14.8	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	2
red maple	Acer rubrum	WDH	High	80.7	861.6	7.5	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
yellow-poplar	Liriodendron tulipifera	WDH	High	71.8	800.2	8.5	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	4
white oak	Quercus alba	WDH	Medium	74.3	734.0	7.9	No change	Sm. dec.	High	Abundant	Very Good	Good			1	5
shortleaf pine	Pinus echinata	WDH	High	61.9	649.4	9.4	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	6
Virginia pine	Pinus virginiana	NDH	High	59.4	580.7	7.8	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	7
eastern redcedar	Juniperus virginiana	WDH	Medium	74.1	485.9	5.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	8
southern red oak	Quercus falcata	WDL	Medium	63.2	337.7	4.2	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
white ash	Fraxinus americana	WDL	Medium	40.2	236.6	5.9	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	10
winged elm	Ulmus alata	WDL	Medium	53.3	231.6	3.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	11
pignut hickory	Carya glabra	WDL	Medium	59.1	221.2	3.1	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	12
black cherry	Prunus serotina	WDL	Medium	70.1	211.0	2.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	13
northern red oak	Quercus rubra	WDH	Medium	50.8	180.0	2.9	No change	No change	High	Common	Good	Good			1	14
flowering dogwood	Cornus florida	WDL	Medium	67.4	171.6	2.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	15
sourwood	Oxydendrum arboreum	NDL	High	51.5	168.1	2.5	Sm. dec.	Lg. dec.	High	Common	Fair	Fair			1	16
post oak	Quercus stellata	WDH	High	37.3	158.8	3.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	17
green ash	Fraxinus pennsylvanica	WSH	Low	19.3	139.2	4.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	18
willow oak	Quercus phellos	NSL	Low	26.5	137.9	4.0	No change	No change	Medium	Common	Fair	Fair			1	19
mockernut hickory	Carya alba	WDL	Medium	45.5	130.9	2.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
chestnut oak	Quercus prinus	NDH	High	17.6	120.6	4.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	21
American beech	Fagus grandifolia	WDH	High	36.9	116.9	3.1	No change	Sm. inc.	Medium	Common	Fair	Good			1	22
American elm	Ulmus americana	WDH	Medium	42.3	115.6	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
shagbark hickory	Carya ovata	WSL	Medium	17.7	109.2	5.1	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
blackgum	Nyssa sylvatica	WDL	Medium	50.7	105.7	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	25
scarlet oak	Quercus coccinea	WDL	Medium	26.6	92.8	3.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	26
sycamore	Platanus occidentalis	NSL	Low	14.9	84.1	4.5	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	27
black walnut	Juglans nigra	WDH	Low	17.4	80.0	4.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	28
American hornbeam; musclev	Carpinus caroliniana	WDL	Low	23	78.3	2.5	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	29
black oak	Quercus velutina	WDH	High	23.3	64.4	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	30
boxelder	Acer negundo	WSH	Low	10.2	64.1	4.1	No change	Sm. inc.	High	Common	Good	Very Good			1	31
ailanthus	Ailanthus altissima	NSL	FIA	10.7	63.4	8.0	Unknown	Unknown	NA	Common	NNIS	NNIS			0	32
hackberry	Celtis occidentalis	WDH	Medium	19.4	57.2	3.3	No change	Sm. inc.	High	Common	Good	Very Good			1	33
florida maple	Acer barbatum	NSL	Low	11	50.2	4.2	Sm. dec.	No change	High	Common	Fair	Good			1	34
slippery elm	Ulmus rubra	WSL	Low	13.7	48.5	2.9	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
common persimmon	Diospyros virginiana	NSL	Low	17.9	43.4	2.0	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	36
water oak	Quercus nigra	WDH	High	7.5	36.9	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	37
eastern redbud	Cercis canadensis	NSL	Low	14.5	32.0	1.4	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
black willow	Salix nigra	NSH	Low	2.8	29.4	9.6	No change	No change	Low	Rare	Very Poor	Very Poor			2	39
sugarberry	Celtis laevigata	NDH	Medium	2	26.9	13.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	40
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	13.2	25.3	1.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	41
American holly	Ilex opaca	NSL	Medium	13.4	23.6	1.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	42
red mulberry	Morus rubra	NSL	Low	9.3	23.0	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	43
river birch	Betula nigra	NSL	Low	5.9	15.5	2.0	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	44
black locust	Robinia pseudoacacia	NDH	Low	8	15.2	2.6	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	45
sugar maple	Acer saccharum	WDH	High	3	11.2	3.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	46
overcup oak	Quercus lyrata	NSL	Medium	0.6	7.3	4.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	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
pitch pine	Pinus rigida	NSH	High	1	5.4	5.4	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	48
blackjack oak	Quercus marilandica	NSL	Medium	2.3	4.4	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	49
sassafras	Sassafras albidum	WSL	Low	3	4.2	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	50
swamp chestnut oak	Quercus michauxii	NSL	Low	0.6	3.7	2.2	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	51
laurel oak	Quercus laurifolia	NDH	Medium	2	3.3	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++		2	52
eastern white pine	Pinus strobus	WDH	High	1.6	3.2	1.3	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	53
shellbark hickory	Carya laciniosa	NSL	Low	1.3	2.7	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
cucumber tree	Magnolia acuminata	NSL	Low	2.2	2.3	0.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	55
bitternut hickory	Carya cordiformis	WSL	Low	1.4	2.1	0.3	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	56
pawpaw	Asimina triloba	NSL	Low	1	1.8	1.8	Lg. dec.	Lg. inc.	Medium	Rare	Very Poor	Very Poor			0	57
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	1	1.3	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	58
butternut	Juglans cinerea	NSLX	FIA	1	1.1	1.1	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	59
American basswood	Tilia americana	WSL	Medium	0.1	0.9	0.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	60
honeylocust	Gleditsia triacanthos	NSH	Low	1	0.8	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	61
silver maple	Acer saccharinum	NSH	Low	1	0.6	0.6	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	62
pecan	Carya illinoensis	NSH	Low	1	0.6	0.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair		Infill +	2	63
swamp tupelo	Nyssa biflora	NDH	Medium	0.3	0.6	0.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	64
striped maple	Acer pensylvanicum	NSL	Medium	2	0.5	0.3	No change	No change	Medium	Rare	Poor	Poor			0	65
serviceberry	Amelanchier spp.	NSL	Low	1.5	0.5	0.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
white mulberry	Morus alba	NSL	FIA	0.4	0.3	0.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	67
wild plum	Prunus americana	NSLX	FIA	0.4	0.3	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	68
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	69
slash pine	Pinus elliotii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	70
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	71
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	72
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	73
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	75
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	76
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	77
blue ash	Fraxinus quadrangulata	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	78
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	80
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	81
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
nuttall oak	Quercus texana	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	83
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	84
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	86