

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 10,533 4,066.9 307

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	Scenario	Scenario	Scenario	SHIFT	SHIFT				
				High	12	18	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2						Increase	16	17	Very Good	7	8	Likely	1	1
Hickory	7			Medium	26	40	No Change	16	20	Good	11	14	Infill	2	3
Maple	3	Abundant	7	Low	28	9	Decrease	24	19	Fair	7	4	Migrate	2	1
Oak	12	Common	13	FIA	1		New	4	4	Poor	12	16		5	5
Pine	3	Rare	37				Unknown	7	7	Very Poor	17	14			
Other	30	Absent	9							FIA Only	1	1			
	57		66		67	67		67	67	Unknown	6	6			
											61	63			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	66.2	67.8	69.2	69.5	
	CCSM85	66.2	68.4	70.7	72.9	
	GFDL45	66.2	69.2	70.3	71.6	
	GFDL85	66.2	68.8	71.7	75.2	
	HAD45	66.2	68.4	71.1	72.0	
HAD85	66.2	68.7	72.4	75.9		
Growing Season (May—Sep)	CCSM45	79.2	80.7	81.6	82.2	
	CCSM85	79.2	81.5	83.5	86.3	
	GFDL45	79.2	82.7	83.7	86.2	
	GFDL85	79.2	82.5	85.8	90.1	
	HAD45	79.2	81.8	84.2	84.7	
HAD85	79.2	82.3	86.5	89.4		
Coldest Month Average	CCSM45	46.4	48.9	49.7	49.8	
	CCSM85	46.4	49.0	50.2	51.4	
	GFDL45	46.4	50.1	50.2	50.1	
	GFDL85	46.4	47.4	48.5	49.0	
	HAD45	46.4	46.7	48.4	49.0	
HAD85	46.4	48.7	50.2	52.1		
Warmest Month Average	CCSM45	83.8	84.8	85.2	85.5	
	CCSM85	83.8	85.7	86.4	87.9	
	GFDL45	83.8	88.3	88.2	90.0	
	GFDL85	83.8	88.0	89.5	92.6	
	HAD45	83.8	86.6	87.7	87.9	
HAD85	83.8	87.3	89.4	90.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.4	43.4	49.4	46.8	
	CCSM85	44.4	44.9	48.8	48.0	
	GFDL45	44.4	45.4	52.6	44.6	
	GFDL85	44.4	44.8	47.7	46.7	
	HAD45	44.4	45.1	43.2	46.6	
HAD85	44.4	46.3	40.4	42.9		
Growing Season (May—Sep)	CCSM45	17.7	18.3	20.0	18.7	
	CCSM85	17.7	17.5	18.0	16.8	
	GFDL45	17.7	19.2	23.7	18.7	
	GFDL85	17.7	19.5	21.0	20.8	
	HAD45	17.7	17.1	16.3	17.7	
HAD85	17.7	17.5	14.4	14.8		

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	73.7	3040.4	32.1	No change	No change	Medium	Abundant	Good	Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	80.3	1138.4	11.6	No change	No change	Medium	Abundant	Good	Good			1	2
post oak	Quercus stellata	WDH	High	78.4	1026.6	11.2	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
winged elm	Ulmus alata	WDL	Medium	83.1	755.6	6.3	No change	No change	Medium	Abundant	Good	Good			1	4
shortleaf pine	Pinus echinata	WDH	High	55.5	642.6	9.0	No change	No change	Medium	Abundant	Good	Good			1	5
water oak	Quercus nigra	WDH	High	76.5	540.5	5.4	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	6
southern red oak	Quercus falcata	WDL	Medium	72.6	523.5	5.5	No change	No change	High	Abundant	Very Good	Very Good			1	7
sugarberry	Celtis laevigata	NDH	Medium	42.9	351.5	6.6	No change	No change	Medium	Common	Fair	Fair			1	8
eastern redcedar	Juniperus virginiana	WDH	Medium	36.3	208.3	4.6	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	9
willow oak	Quercus phellos	NSL	Low	32.6	193.7	6.0	No change	No change	Medium	Common	Fair	Fair			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	26.9	182.4	6.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
American elm	Ulmus americana	WDH	Medium	29.3	125.9	3.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	12
blackjack oak	Quercus marilandica	NSL	Medium	28.2	123.9	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
black hickory	Carya texana	NDL	High	35.2	122.1	2.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
pecan	Carya illinoensis	NSH	Low	12.8	122.1	10.0	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor			0	15
cedar elm	Ulmus crassifolia	NDH	Medium	18.9	110.8	8.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
blackgum	Nyssa sylvatica	WDL	Medium	37.4	97.5	2.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	17
white ash	Fraxinus americana	WDL	Medium	27	84.4	2.7	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	18
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	22.5	77.1	2.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	19
mockernut hickory	Carya alba	WDL	Medium	23.9	55.1	1.8	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	20
black willow	Salix nigra	NSH	Low	7.9	49.9	4.2	No change	No change	Low	Rare	Very Poor	Very Poor			0	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	19.9	49.0	2.0	No change	No change	High	Rare	Fair	Fair			1	22
sassafras	Sassafras albidum	WSL	Low	27.4	45.6	1.5	No change	No change	Medium	Rare	Poor	Poor			1	23
bluejack oak	Quercus incana	NSL	Low	10.2	45.4	4.7	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	15.4	45.0	2.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	25
honeylocust	Gleditsia triacanthos	NSH	Low	16.8	43.8	3.2	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	26
red maple	Acer rubrum	WDH	High	16.7	39.1	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	27
white oak	Quercus alba	WDH	Medium	12.6	37.1	1.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	28
overcup oak	Quercus lyrata	NSL	Medium	3.4	36.5	8.2	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	29
river birch	Betula nigra	NSL	Low	13.5	34.9	2.4	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	30
black walnut	Juglans nigra	WDH	Low	2.8	32.9	11.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
flowering dogwood	Cornus florida	WDL	Medium	21.4	30.2	0.7	No change	No change	Medium	Rare	Poor	Poor			1	32
common persimmon	Diospyros virginiana	NSL	Low	12.4	28.2	1.7	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor			1	33
slash pine	Pinus elliotii	NDH	High	1.9	26.5	14.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	34
eastern redbud	Cercis canadensis	NSL	Low	13.1	25.7	1.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	35
red mulberry	Morus rubra	NSL	Low	11.5	20.9	1.5	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	36
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	7.4	20.4	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	37
boxelder	Acer negundo	WSH	Low	3.8	19.4	5.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	38
American holly	Ilex opaca	NSL	Medium	16.1	18.6	0.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	39
Osage-orange	Maclura pomifera	NDH	Medium	1.8	12.1	6.3	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	40
black cherry	Prunus serotina	WDL	Medium	7.3	11.5	1.0	No change	No change	Low	Rare	Very Poor	Very Poor			0	41
water elm	Planera aquatica	NSL	Low	6.6	11.5	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
shagbark hickory	Carya ovata	WSL	Medium	2.7	11.3	3.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	43
florida maple	Acer barbatum	NSL	Low	2.6	10.2	3.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	44
water hickory	Carya aquatica	NSL	Medium	6.3	7.7	2.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	45
sycamore	Platanus occidentalis	NSL	Low	2.8	7.4	2.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
eastern cottonwood	Populus deltoides	NSH	Low	0.9	5.1	5.4	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		
wild plum	<i>Prunus americana</i>	NSLX	FIA	0.2	5.0	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0	48	
American basswood	<i>Tilia americana</i>	WSL	Medium	6.6	4.9	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor					0	49
slippery elm	<i>Ulmus rubra</i>	WSL	Low	2.9	3.8	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor					0	50
bitternut hickory	<i>Carya cordiformis</i>	WSL	Low	1.9	3.3	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor					0	51
swamp tupelo	<i>Nyssa biflora</i>	NDH	Medium	0.9	3.1	3.3	No change	No change	Low	Rare	Very Poor	Very Poor					2	52
Shumard oak	<i>Quercus shumardii</i>	NSL	Low	0.8	2.4	2.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor					0	53
sweetbay	<i>Magnolia virginiana</i>	NSL	Medium	1.1	1.1	0.5	Very Lg. dec.	No change	Medium	Rare	Lost	Poor					0	54
black oak	<i>Quercus velutina</i>	WDH	High	0.9	1.1	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor					0	55
laurel oak	<i>Quercus laurifolia</i>	NDH	Medium	1	1.0	0.2	Very Lg. dec.	No change	Medium	Rare	Lost	Poor					0	56
shellbark hickory	<i>Carya laciniosa</i>	NSL	Low	0.9	0.6	0.7	No change	No change	Medium	Rare	Poor	Poor					0	57
ashe juniper	<i>Juniperus ashei</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat					0	58
longleaf pine	<i>Pinus palustris</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +			3	59
yellow buckeye	<i>Aesculus flava</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown					0	60
serviceberry	<i>Amelanchier spp.</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	61
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +				3	62
black ash	<i>Fraxinus nigra</i>	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown					0	63
redbay	<i>Persea borbonia</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown					0	64
northern red oak	<i>Quercus rubra</i>	WDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown					0	65
live oak	<i>Quercus virginiana</i>	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +			3	66
black locust	<i>Robinia pseudoacacia</i>	NDH	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown					0	67