

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 10,306 3,979.1 110

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	9	14	Increase	13	15	Very Good	2	2	Likely	1	1
Hickory	6			Medium	20	28	No Change	13	13	Good	11	12	Infill	14	16
Maple	1	Abundant	0	Low	18	6	Decrease	16	14	Fair	7	7	Migrate	0	0
Oak	12	Common	15	FIA	2		New	2	2	Poor	12	13			
Pine	1	Rare	29				Unknown	5	5	Very Poor	9	8			
Other	21	Absent	4							FIA Only	2	2			
	44		48		49	48		49	49	Unknown	3	3			
											46	47			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	63.6	65.1	66.7	67.2	
	CCSM85	63.6	65.8	68.0	70.5	
	GFDL45	63.6	68.8	68.0	69.4	
	GFDL85	63.6	66.4	69.3	73.0	
	HAD45	63.6	65.8	68.4	69.4	
	HAD85	63.6	66.1	70.2	73.5	
Growing Season (May—Sep)	CCSM45	78.4	79.7	81.1	81.8	
	CCSM85	78.4	80.8	82.8	85.8	
	GFDL45	78.4	85.2	83.6	86.2	
	GFDL85	78.4	82.2	85.6	90.2	
	HAD45	78.4	80.7	83.2	83.8	
	HAD85	78.4	81.2	86.0	88.9	
Coldest Month (Average)	CCSM45	41.4	43.6	44.4	44.8	
	CCSM85	41.4	43.6	44.7	46.0	
	GFDL45	41.4	44.9	45.0	45.1	
	GFDL85	41.4	42.4	43.9	44.3	
	HAD45	41.4	41.9	44.0	44.3	
	HAD85	41.4	44.1	45.9	47.6	
Warmest Month (Average)	CCSM45	84.3	85.3	86.1	86.3	
	CCSM85	84.3	86.5	87.1	88.8	
	GFDL45	84.3	89.5	89.7	91.7	
	GFDL85	84.3	89.2	90.9	94.7	
	HAD45	84.3	86.7	88.0	88.2	
	HAD85	84.3	87.5	90.0	90.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	41.8	42.8	43.0	42.3	
	CCSM85	41.8	40.8	43.7	43.2	
	GFDL45	41.8	43.5	49.5	42.2	
	GFDL85	41.8	43.3	46.8	46.3	
	HAD45	41.8	42.4	41.9	44.7	
	HAD85	41.8	44.6	38.8	42.1	
Growing Season (May—Sep)	CCSM45	17.8	19.1	17.2	18.0	
	CCSM85	17.8	17.6	16.8	16.7	
	GFDL45	17.8	19.2	22.4	18.8	
	GFDL85	17.8	19.6	21.3	20.1	
	HAD45	17.8	17.5	16.9	17.9	
	HAD85	17.8	18.2	14.1	15.3	

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	71.2	392.2	16.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	1
Osage-orange	Maclura pomifera	NDH	Medium	66.9	257.7	10.3	No change	No change	High	Common	Good	Good			1	2
post oak	Quercus stellata	WDH	High	38.3	227.2	15.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	3
cedar elm	Ulmus crassifolia	NDH	Medium	49	210.8	10.7	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	4
sugarberry	Celtis laevigata	NDH	Medium	65.3	210.0	12.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	5
pecan	Carya illinoensis	NSH	Low	54.5	167.9	8.1	No change	No change	Low	Common	Poor	Poor			0	6
winged elm	Ulmus alata	WDL	Medium	52	165.6	9.2	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
green ash	Fraxinus pennsylvanica	WSH	Low	57.6	164.5	8.2	No change	No change	Medium	Common	Fair	Fair			1	8
honeylocust	Gleditsia triacanthos	NSH	Low	55.4	123.1	5.7	No change	No change	High	Common	Good	Good			1	9
blackjack oak	Quercus marilandica	NSL	Medium	22.9	114.7	10.4	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	10
hackberry	Celtis occidentalis	WDH	Medium	24	94.9	9.2	Lg. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	11
water oak	Quercus nigra	WDH	High	16.5	91.5	10.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	12
black hickory	Carya texana	NDL	High	7.3	76.2	5.9	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	13
white ash	Fraxinus americana	WDL	Medium	9.9	63.0	9.3	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	14
American elm	Ulmus americana	WDH	Medium	53.4	50.2	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
slippery elm	Ulmus rubra	WSL	Low	14.6	40.3	8.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	16
Shumard oak	Quercus shumardii	NSL	Low	28.4	34.9	2.1	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	17
Texas ash	Fraxinus texensis	NDH	FIA	9	31.2	9.7	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	18
black walnut	Juglans nigra	WDH	Low	4.9	24.8	13.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	19
bur oak	Quercus macrocarpa	NDH	Medium	9.9	24.5	5.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	20
boxelder	Acer negundo	WSH	Low	20.8	21.6	6.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	21
black willow	Salix nigra	NSH	Low	19	16.9	4.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	1	22
common persimmon	Diospyros virginiana	NSL	Low	24.6	16.6	3.5	No change	No change	High	Rare	Fair	Fair			1	23
eastern cottonwood	Populus deltoides	NSH	Low	20	15.7	3.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	24
chinkapin oak	Quercus muehlenbergii	NSL	Medium	10.6	12.3	3.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	14.8	9.4	3.2	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	26
mockernut hickory	Carya alba	WDL	Medium	6.6	6.9	0.9	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	27
sweetgum	Liquidambar styraciflua	WDH	High	1	6.7	6.9	No change	No change	Medium	Rare	Poor	Poor			0	28
red mulberry	Morus rubra	NSL	Low	26.1	5.9	1.7	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	29
southern red oak	Quercus falcata	WDL	Medium	7.5	5.6	1.6	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	30
flowering dogwood	Cornus florida	WDL	Medium	0.4	3.2	1.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
eastern redbud	Cercis canadensis	NSL	Low	9.2	3.1	0.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	32
black oak	Quercus velutina	WDH	High	4.2	1.7	0.6	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
shagbark hickory	Carya ovata	WSL	Medium	4.8	1.6	1.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	34
northern red oak	Quercus rubra	WDH	Medium	6.7	1.2	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	35
loblolly pine	Pinus taeda	WDH	High	3	1.1	3.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	36
sycamore	Platanus occidentalis	NSL	Low	0.2	1.1	0.2	No change	No change	Medium	Rare	Poor	Poor			0	37
black cherry	Prunus serotina	WDL	Medium	1.7	0.9	0.5	Very Lg. dec.	Sm. dec.	Low	Rare	Lost	Very Poor			0	38
bitternut hickory	Carya cordiformis	WSL	Low	7.1	0.9	1.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	39
willow oak	Quercus phellos	NSL	Low	0.7	0.6	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
water hickory	Carya aquatica	NSL	Medium	0.7	0.4	0.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
live oak	Quercus virginiana	NDH	High	3.7	0.3	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	42
overcup oak	Quercus lyrata	NSL	Medium	0.7	0.3	0.2	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	43
wild plum	Prunus americana	NSLX	FIA	3.7	0.2	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	44
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	45
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	46
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			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
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	48
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	49