

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	9,941.4	3,838.4	162

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	16	23	Increase	24	28	Very Good	16	17	Likely	0	0
Hickory	6			Medium	25	44	No Change	11	9	Good	11	13	Infill	6	8
Maple	5	Abundant	3	Low	32	9	Decrease	24	22	Fair	7	7	Migrate	5	7
Oak	12	Common	37	FIA	6		New	10	12	Poor	17	14			
Pine	2	Rare	25				Unknown	10	8	Very Poor	8	7			
Other	37	Absent	14							FIA Only	3	3			
	65		79		79	76		79	79	Unknown	4	2			
											66	63			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	57.9	59.7	62.1	62.3	
	CCSM85	57.9	60.2	63.0	66.0	
	GFDL45	57.9	61.4	63.0	63.7	
	GFDL85	57.9	60.6	64.0	67.5	
	HAD45	57.9	60.5	63.7	65.0	
	HAD85	57.9	60.9	65.5	69.4	
Growing Season (May—Sep)	CCSM45	73.3	75.0	77.1	77.6	
	CCSM85	73.3	75.4	78.4	82.4	
	GFDL45	73.3	77.3	79.1	80.4	
	GFDL85	73.3	76.5	80.6	84.7	
	HAD45	73.3	76.6	79.8	81.4	
	HAD85	73.3	77.0	83.7	87.2	
Coldest Month (Average)	CCSM45	34.3	36.1	37.7	38.0	
	CCSM85	34.3	37.5	38.6	40.2	
	GFDL45	34.3	38.1	38.0	38.3	
	GFDL85	34.3	35.8	37.0	37.5	
	HAD45	34.3	34.8	37.0	37.3	
	HAD85	34.3	36.2	38.0	39.6	
Warmest Month (Average)	CCSM45	78.5	80.1	81.4	81.5	
	CCSM85	78.5	80.7	82.4	84.2	
	GFDL45	78.5	81.5	83.1	83.9	
	GFDL85	78.5	81.7	84.1	86.5	
	HAD45	78.5	82.9	85.6	86.2	
	HAD85	78.5	84.4	89.1	90.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	50.4	52.0	57.2	55.4	
	CCSM85	50.4	56.7	56.6	60.8	
	GFDL45	50.4	57.2	60.3	63.2	
	GFDL85	50.4	57.4	61.0	64.3	
	HAD45	50.4	48.4	52.3	52.5	
	HAD85	50.4	50.5	47.1	52.0	
Growing Season (May—Sep)	CCSM45	21.0	20.3	21.8	21.2	
	CCSM85	21.0	22.3	19.8	21.4	
	GFDL45	21.0	24.0	24.2	25.0	
	GFDL85	21.0	23.8	24.6	25.2	
	HAD45	21.0	19.8	18.9	19.2	
	HAD85	21.0	20.4	15.8	17.0	

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	65.1	1173.0	13.9	No change	No change	Medium	Abundant	Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	68.4	864.5	10.2	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
yellow-poplar	Liriodendron tulipifera	WDH	High	50.1	590.1	10.9	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	3
hackberry	Celtis occidentalis	WDH	Medium	49	463.0	8.1	Sm. dec.	No change	High	Common	Fair	Good			1	4
white ash	Fraxinus americana	WDL	Medium	51.7	299.4	5.4	No change	No change	Low	Common	Poor	Poor			0	5
shagbark hickory	Carya ovata	WSL	Medium	47.3	288.7	5.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	6
winged elm	Ulmus alata	WDL	Medium	56.6	280.3	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	7
sassafras	Sassafras albidum	WSL	Low	38.1	274.8	6.4	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
chinkapin oak	Quercus muehlenbergii	NSL	Medium	44.6	234.7	3.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
pignut hickory	Carya glabra	WDL	Medium	41.9	210.6	4.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	10
black walnut	Juglans nigra	WDH	Low	43	209.3	4.4	Sm. dec.	No change	Medium	Common	Poor	Fair			1	11
boxelder	Acer negundo	WSH	Low	32.9	201.0	7.3	No change	Sm. inc.	High	Common	Good	Very Good			1	12
northern red oak	Quercus rubra	WDH	Medium	25.7	191.5	6.6	No change	No change	High	Common	Good	Good			1	13
white oak	Quercus alba	WDH	Medium	40.1	189.8	4.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
American elm	Ulmus americana	WDH	Medium	49.9	175.8	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	15
black oak	Quercus velutina	WDH	High	32	165.6	4.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
American beech	Fagus grandifolia	WDH	High	38.8	161.2	3.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
slippery elm	Ulmus rubra	WSL	Low	35	146.5	3.1	No change	Sm. inc.	Medium	Common	Fair	Good			1	18
black locust	Robinia pseudoacacia	NDH	Low	19.9	136.3	5.0	Lg. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	19
green ash	Fraxinus pennsylvanica	WSH	Low	41	131.6	3.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	20
sugarberry	Celtis laevigata	NDH	Medium	23.8	130.7	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
mockernut hickory	Carya alba	WDL	Medium	37.4	118.0	3.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	22
bitternut hickory	Carya cordiformis	WSL	Low	32	117.7	3.5	No change	No change	High	Common	Good	Good			1	23
flowering dogwood	Cornus florida	WDL	Medium	33	114.9	3.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	24
Osage-orange	Maclura pomifera	NDH	Medium	12.4	114.8	5.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	25
post oak	Quercus stellata	WDH	High	24.3	109.9	5.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
red maple	Acer rubrum	WDH	High	27.1	108.5	4.5	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	27
sweetgum	Liquidambar styraciflua	WDH	High	24	106.9	7.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
black cherry	Prunus serotina	WDL	Medium	38	104.5	3.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	29
ailanthus	Ailanthus altissima	NSL	FIA	16	101.8	4.0	Unknown	Unknown	NA	Common	NNIS	NNIS			0	30
scarlet oak	Quercus coccinea	WDL	Medium	19.3	97.1	4.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	31
blackgum	Nyssa sylvatica	WDL	Medium	46	90.4	2.7	Sm. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
sycamore	Platanus occidentalis	NSL	Low	26.9	78.8	4.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	33
blue ash	Fraxinus quadrangulata	NSL	Low	20.6	73.1	3.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	34
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32	69.5	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	35
silver maple	Acer saccharinum	NSH	Low	3.1	66.8	13.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	36
common persimmon	Diospyros virginiana	NSL	Low	29.2	58.3	2.0	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	37
southern red oak	Quercus falcata	WDL	Medium	16.8	56.8	4.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	38
red mulberry	Morus rubra	NSL	Low	28.5	53.5	2.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	39
honeylocust	Gleditsia triacanthos	NSH	Low	12.4	52.0	1.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	40
eastern redbud	Cercis canadensis	NSL	Low	28.4	44.7	1.3	No change	Sm. inc.	Medium	Rare	Poor	Fair			1	41
yellow buckeye	Aesculus flava	NSL	Low	7	43.5	4.9	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	42
chestnut oak	Quercus prinus	NDH	High	10.1	32.8	2.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	43
sourwood	Oxydendrum arboreum	NDL	High	9.7	29.1	2.2	No change	No change	High	Rare	Fair	Fair			1	44
shellbark hickory	Carya laciniosa	NSL	Low	3.4	28.4	4.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	45
Shumard oak	Quercus shumardii	NSL	Low	4.7	22.8	3.4	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	1	46
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	22.2	21.6	1.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	47



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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern cottonwood	Populus deltoides	NSH	Low	1.4	12.5	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	48
shingle oak	Quercus imbricaria	NDH	Medium	1.7	7.6	3.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	49
American basswood	Tilia americana	WSL	Medium	2.5	6.7	2.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
pawpaw	Asimina triloba	NSL	Low	4.9	6.6	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	51
paulownia	Paulownia tomentosa	NSL	FIA	3	6.4	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
swamp white oak	Quercus bicolor	NSL	Low	1	6.2	6.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	53
black willow	Salix nigra	NSH	Low	4	6.1	24.1	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	2	54
butternut	Juglans cinerea	NSLX	FIA	2	5.9	2.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	55
loblolly pine	Pinus taeda	WDH	High	1	5.4	5.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	56
Virginia pine	Pinus virginiana	NDH	High	1.2	5.0	2.1	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	57
wild plum	Prunus americana	NSLX	FIA	0.1	3.7	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	58
pecan	Carya illinoensis	NSH	Low	1	3.0	3.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	59
serviceberry	Amelanchier spp.	NSL	Low	1.6	2.8	0.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	60
black maple	Acer nigrum	NSH	Low	0.6	2.4	1.3	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	61
white mulberry	Morus alba	NSL	FIA	2	2.0	1.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	62
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	1	1.2	1.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	63
pin cherry	Prunus pensylvanica	NSL	Low	0.2	0.5	0.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	64
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	4	0.5	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	65
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	66
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	67
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	68
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
river birch	Betula nigra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	70
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	73
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	75
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	76
willow oak	Quercus phellos	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	78
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	79