

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	284

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									
Hickory	5									
Maple	4	Abundant 6	High 20	23	Increase 22	33	Very Good 12	14	Likely 1	1
Oak	13	Common 27	Medium 31	50	No Change 14	8	Good 12	17	Infill 4	9
Pine	6	Rare 38	Low 32	11	Decrease 31	26	Fair 14	14	Migrate 0	4
Other	41	Absent 15	FIA 4		New 7	10	Poor 6	6		
	71	86	87	84	Unknown 13	10	Very Poor 17	11	5	14
					87	87	FIA Only 1	1		
							Unknown 9	6		
							71	69		

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	57.6	59.4	61.5	61.6
	CCSM85	57.6	59.8	62.2	65.2
	GFDL45	57.6	60.2	62.8	63.6
	GFDL85	57.6	60.6	63.9	67.7
	HAD45	57.6	59.9	63.0	64.3
HAD85	57.6	60.1	64.2	68.5	
Growing Season May—Sep	CCSM45	72.2	74.0	75.9	76.5
	CCSM85	72.2	74.3	76.9	80.7
	GFDL45	72.2	75.1	78.0	79.4
	GFDL85	72.2	75.8	79.5	83.8
	HAD45	72.2	75.1	78.1	79.7
HAD85	72.2	75.1	80.3	85.1	
Coldest Month Average	CCSM45	36.0	38.1	39.0	39.3
	CCSM85	36.0	38.4	39.4	40.6
	GFDL45	36.0	39.5	39.8	40.5
	GFDL85	36.0	38.3	39.2	40.4
	HAD45	36.0	36.9	38.7	38.9
HAD85	36.0	37.2	38.6	40.1	
Warmest Month Average	CCSM45	77.6	79.7	80.8	80.8
	CCSM85	77.6	79.9	81.7	83.3
	GFDL45	77.6	80.7	82.0	83.0
	GFDL85	77.6	81.5	83.6	86.0
	HAD45	77.6	81.0	83.0	83.8
HAD85	77.6	81.7	84.9	87.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	45.2	49.2	52.1	52.9
	CCSM85	45.2	50.8	52.8	58.2
	GFDL45	45.2	50.6	54.0	56.5
	GFDL85	45.2	48.8	54.7	55.6
	HAD45	45.2	48.8	50.0	49.4
HAD85	45.2	51.1	48.1	50.2	
Growing Season May—Sep	CCSM45	20.4	23.9	25.6	26.3
	CCSM85	20.4	23.9	24.5	27.3
	GFDL45	20.4	23.5	25.4	26.8
	GFDL85	20.4	22.1	26.0	26.5
	HAD45	20.4	22.3	21.9	22.1
HAD85	20.4	24.1	22.2	22.5	

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
Virginia pine	Pinus virginiana	NDH	High	88.3	1655.0	14.4	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	1
yellow-poplar	Liriodendron tulipifera	WDH	High	91.6	1536.7	12.7	Lg. dec.	Lg. dec.	High	Abundant	Good	Good			1	2
red maple	Acer rubrum	WDH	High	92.8	1186.4	8.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
loblolly pine	Pinus taeda	WDH	High	48.2	1121.0	15.6	Lg. inc.	Lg. inc.	Medium	Abundant	Very Good	Very Good			1	4
sweetgum	Liquidambar styraciflua	WDH	High	70.4	885.9	8.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	5
white oak	Quercus alba	WDH	Medium	84.3	638.9	5.8	No change	No change	High	Abundant	Very Good	Very Good			1	6
sourwood	Oxydendrum arboreum	NDL	High	68	322.0	3.3	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	7
shortleaf pine	Pinus echinata	WDH	High	50.6	309.1	4.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
eastern redcedar	Juniperus virginiana	WDH	Medium	55.1	260.6	3.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	9
black cherry	Prunus serotina	WDL	Medium	72	252.7	2.8	No change	Sm. inc.	Low	Common	Poor	Fair			1	10
mockernut hickory	Carya alba	WDL	Medium	58.3	251.9	3.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	11
southern red oak	Quercus falcata	WDL	Medium	48.8	208.8	3.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
northern red oak	Quercus rubra	WDH	Medium	57.6	206.0	2.7	No change	No change	High	Common	Good	Good			1	13
pignut hickory	Carya glabra	WDL	Medium	56.4	203.3	2.9	No change	No change	Medium	Common	Fair	Fair			1	14
chestnut oak	Quercus prinus	NDH	High	23.2	201.6	6.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	15
American beech	Fagus grandifolia	WDH	High	52	200.6	3.2	No change	No change	Medium	Common	Fair	Fair			1	16
blackgum	Nyssa sylvatica	WDL	Medium	70.1	196.2	2.0	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	17
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	55	164.6	2.4	No change	Sm. inc.	Medium	Common	Fair	Good			1	18
sycamore	Platanus occidentalis	NSL	Low	28.7	140.8	3.6	No change	Sm. inc.	Medium	Common	Fair	Good			1	19
white ash	Fraxinus americana	WDL	Medium	45.4	133.0	2.5	No change	Sm. inc.	Low	Common	Poor	Fair			1	20
American elm	Ulmus americana	WDH	Medium	35.6	122.8	1.9	No change	Lg. inc.	Medium	Common	Fair	Very Good			1	21
scarlet oak	Quercus coccinea	WDL	Medium	36.6	107.4	2.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	22
black oak	Quercus velutina	WDH	High	38.8	104.5	2.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
flowering dogwood	Cornus florida	WDL	Medium	62.8	103.2	1.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
ailanthus	Ailanthus altissima	NSL	FIA	15.1	94.1	5.2	Unknown	Unknown	NA	Common	NNIS	NNIS			0	25
river birch	Betula nigra	NSL	Low	12.1	92.8	5.0	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	26
green ash	Fraxinus pennsylvanica	WSH	Low	31.6	85.6	1.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	27
winged elm	Ulmus alata	WDL	Medium	28.8	85.1	1.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	28
willow oak	Quercus phellos	NSL	Low	23.5	81.3	2.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	29
boxelder	Acer negundo	WSH	Low	11.7	81.1	4.2	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	30
post oak	Quercus stellata	WDH	High	32.9	70.2	1.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	31
hackberry	Celtis occidentalis	WDH	Medium	10	69.0	4.7	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	32
common persimmon	Diospyros virginiana	NSL	Low	20.7	64.9	2.6	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	33
black locust	Robinia pseudoacacia	NDH	Low	17.6	45.5	1.5	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	34
eastern white pine	Pinus strobus	WDH	High	7.7	42.8	4.0	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	35
eastern redbud	Cercis canadensis	NSL	Low	26.9	42.1	1.3	Lg. dec.	No change	Medium	Rare	Very Poor	Poor			1	36
black walnut	Juglans nigra	WDH	Low	11.1	41.9	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
slippery elm	Ulmus rubra	WSL	Low	13.3	38.4	2.0	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	38
shagbark hickory	Carya ovata	WSL	Medium	11.5	24.1	1.7	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	39
florida maple	Acer barbatum	NSL	Low	3	17.6	1.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	40
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0.8	15.1	12.7	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	41
sassafras	Sassafras albidum	WSL	Low	10.4	14.2	0.8	No change	Lg. inc.	Medium	Rare	Poor	Good			1	42
sweet birch	Betula lenta	NDH	High	3	11.4	2.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	43
pitch pine	Pinus rigida	NSH	High	7	10.3	0.9	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	44
American basswood	Tilia americana	WSL	Medium	1.9	9.6	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	45
paulownia	Paulownia tomentosa	NSL	FIA	0.2	9.5	2.1	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	46
bitternut hickory	Carya cordiformis	WSL	Low	7	9.2	1.3	Very Lg. dec.	Lg. dec.	High	Rare	Lost	Poor		Infill +	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
sugarberry	Celtis laevigata	NDH	Medium	2	9.2	4.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	48
black willow	Salix nigra	NSH	Low	3.3	9.0	1.3	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	49
sugar maple	Acer saccharum	WDH	High	6.3	9.0	1.2	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	50
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	6.9	8.5	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	51
pawpaw	Asimina triloba	NSL	Low	5.4	5.9	0.7	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	52
red mulberry	Morus rubra	NSL	Low	5.9	5.7	0.5	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair		Infill +	1	53
cucumbertree	Magnolia acuminata	NSL	Low	3.9	5.6	1.0	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
serviceberry	Amelanchier spp.	NSL	Low	6	5.3	0.9	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	55
honeylocust	Gleditsia triacanthos	NSH	Low	2.3	4.3	0.7	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			2	56
water oak	Quercus nigra	WDH	High	2	4.0	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	57
pecan	Carya illinoensis	NSH	Low	1	3.3	3.3	Sm. inc.	Lg. inc.	Low	Rare	Poor	Fair		Infill +	2	58
blackjack oak	Quercus marilandica	NSL	Medium	1.4	3.2	1.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	59
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1	2.7	2.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	60
longleaf pine	Pinus palustris	NSH	Medium	0.3	2.0	0.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	61
American holly	Ilex opaca	NSL	Medium	2	1.7	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	62
white mulberry	Morus alba	NSL	FIA	1	1.5	1.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	63
bigleaf magnolia	Magnolia macrophylla	NSL	Low	2	1.4	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	64
laurel oak	Quercus laurifolia	NDH	Medium	1.8	0.9	0.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	65
bigtooth aspen	Populus grandidentata	NSL	Medium	0.8	0.7	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	66
swamp tupelo	Nyssa biflora	NDH	Medium	0.1	0.6	0.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	67
swamp chestnut oak	Quercus michauxii	NSL	Low	0.9	0.6	0.6	Very Lg. dec.	No change	Medium	Rare	Lost	Poor			0	68
butternut	Juglans cinerea	NSLX	FIA	1	0.5	0.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	69
yellow birch	Betula alleghaniensis	NDL	High	1	0.4	0.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	70
southern magnolia	Magnolia grandiflora	NSL	Low	1	0.2	0.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			0	71
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	72
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	73
striped maple	Acer pensylvanicum	NSL	Medium	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
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	76
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	77
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat			3	78
silverbell	Halesia spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	79
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	80
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	81
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	82
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	83
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	84
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	85
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat		Migrate +	3	86
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	87