

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 4,066.9 272

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	Low	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85			
Ash	2			15	27	Increase	33	36	Very Good	11	13	Likely	4	4
Hickory	7			36	52	No Change	21	22	Good	20	19	Infill	18	19
Maple	4	Abundant	4	38	11	Decrease	21	17	Fair	15	20	Migrate	2	2
Oak	16	Common	31	2		New	8	8	Poor	17	11			
Pine	5	Rare	42			Unknown	8	8	Very Poor	11	10			
Other	43	Absent	11						FIA Only	1	1			
	77		88	91	90		91	91	Unknown	6	6		24	25
										81	80			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	65.9	67.6	69.3	69.5	
	CCSM85	65.9	67.8	70.3	72.6	
	GFDL45	65.9	69.2	70.1	71.1	
	GFDL85	65.9	68.5	71.5	74.8	
	HAD45	65.9	68.3	71.2	72.3	
HAD85	65.9	68.6	72.5	76.2		
Growing Season (May-Sep)	CCSM45	78.6	80.1	81.4	81.8	
	CCSM85	78.6	80.3	82.6	85.4	
	GFDL45	78.6	82.3	83.0	84.9	
	GFDL85	78.6	81.6	84.8	88.9	
	HAD45	78.6	81.7	84.4	85.1	
HAD85	78.6	82.0	87.1	90.3		
Coldest Month Average	CCSM45	46.7	49.1	50.0	50.0	
	CCSM85	46.7	49.4	50.7	51.9	
	GFDL45	46.7	50.2	50.2	50.2	
	GFDL85	46.7	47.9	48.7	49.4	
	HAD45	46.7	47.3	49.0	49.9	
HAD85	46.7	48.6	50.0	51.8		
Warmest Month Average	CCSM45	82.3	83.5	84.0	84.1	
	CCSM85	82.3	83.7	84.7	86.2	
	GFDL45	82.3	86.1	85.9	87.3	
	GFDL85	82.3	85.6	87.0	89.6	
	HAD45	82.3	86.2	87.8	87.8	
HAD85	82.3	86.7	89.8	90.7		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	59.1	62.1	67.2	64.7	
	CCSM85	59.1	62.2	64.6	67.0	
	GFDL45	59.1	64.5	72.5	68.0	
	GFDL85	59.1	63.9	65.7	67.6	
	HAD45	59.1	58.0	59.5	62.7	
HAD85	59.1	60.8	54.3	58.9		
Growing Season (May-Sep)	CCSM45	22.2	22.6	23.5	22.8	
	CCSM85	22.2	21.0	21.8	21.3	
	GFDL45	22.2	25.3	30.4	26.5	
	GFDL85	22.2	26.0	27.8	29.5	
	HAD45	22.2	21.5	22.3	21.9	
HAD85	22.2	21.5	18.0	18.5		

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
loblolly pine	Pinus taeda	WDH	High	43	1545.6	26.6	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	1
sweetgum	Liquidambar styraciflua	WDH	High	77.7	977.3	12.3	No change	No change	Medium	Abundant	Good	Good			1	2
sugarberry	Celtis laevigata	NDH	Medium	57.3	665.5	10.7	No change	No change	Medium	Abundant	Good	Good			1	3
water oak	Quercus nigra	WDH	High	67	576.8	7.3	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
water hickory	Carya aquatica	NSL	Medium	36	328.6	8.9	No change	No change	Medium	Common	Fair	Fair			1	5
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	46.1	319.0	6.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	6
black willow	Salix nigra	NSH	Low	24.2	318.1	15.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	7
sycamore	Platanus occidentalis	NSL	Low	35.3	254.4	6.8	Sm. dec.	No change	Medium	Common	Poor	Fair			1	8
green ash	Fraxinus pennsylvanica	WSH	Low	45.6	249.6	4.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	9
bald cypress	Taxodium distichum	NSH	Medium	19.9	236.4	12.7	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	10
overcup oak	Quercus lyrata	NSL	Medium	27.3	232.4	8.5	No change	Sm. inc.	Low	Common	Poor	Fair			1	11
willow oak	Quercus phellos	NSL	Low	28.4	212.4	7.4	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
boxelder	Acer negundo	WSH	Low	33.7	186.7	4.7	No change	No change	High	Common	Good	Good			1	13
nuttall oak	Quercus texana	NSH	Medium	27.6	163.5	5.9	No change	No change	High	Common	Good	Good			0	14
white oak	Quercus alba	WDH	Medium	31.6	144.9	4.1	No change	No change	High	Common	Good	Good			1	15
pecan	Carya illinoensis	NSH	Low	33.5	139.4	4.3	Sm. inc.	Lg. inc.	Low	Common	Fair	Good			1	16
yellow-poplar	Liriodendron tulipifera	WDH	High	26.9	123.2	3.5	No change	No change	High	Common	Good	Good			1	17
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	34.4	120.8	2.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
American beech	Fagus grandifolia	WDH	High	25.6	120.2	3.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	19
honeylocust	Gleditsia triacanthos	NSH	Low	32.3	112.4	2.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	20
winged elm	Ulmus alata	WDL	Medium	50.2	110.2	1.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
American elm	Ulmus americana	WDL	Medium	42.7	104.4	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
slippery elm	Ulmus rubra	WSL	Low	28.9	101.3	3.1	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	23
eastern cottonwood	Populus deltoides	NSH	Low	10.1	88.7	8.3	Sm. dec.	No change	Medium	Common	Poor	Fair	Infill +	Infill +	1	24
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	37.1	85.8	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	25
southern red oak	Quercus falcata	WDL	Medium	24.7	85.1	2.9	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	26
water tupelo	Nyssa aquatica	NSH	Medium	8.1	82.2	6.7	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	27
pignut hickory	Carya glabra	WDL	Medium	32	67.7	1.8	No change	No change	Medium	Common	Fair	Fair			1	28
flowering dogwood	Cornus florida	WDL	Medium	37	63.9	1.5	No change	No change	Medium	Common	Fair	Fair			1	29
red maple	Acer rubrum	WDH	High	36.1	57.7	1.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
common persimmon	Diospyros virginiana	NSL	Low	27.4	55.3	1.7	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	31
blackgum	Nyssa sylvatica	WDL	Medium	24.5	55.1	1.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	32
shortleaf pine	Pinus echinata	WDH	High	19.2	52.8	2.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	33
black cherry	Prunus serotina	WDL	Medium	30.9	51.7	1.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	34
water elm	Planera aquatica	NSL	Low	9.9	51.6	4.6	No change	No change	Medium	Common	Fair	Fair			1	35
southern magnolia	Magnolia grandiflora	NSL	Low	19.1	35.2	1.2	Lg. inc.	Sm. inc.	Medium	Rare	Good	Fair			1	36
waterlocust	Gleditsia aquatica	NSLX	FIA	3.7	32.8	3.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	37
black locust	Robinia pseudoacacia	NDH	Low	10.4	32.0	3.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
cedar elm	Ulmus crassifolia	NDH	Medium	10.4	31.6	2.9	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	39
sourwood	Oxydendrum arboreum	NDL	High	18.1	29.0	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	1	40
white ash	Fraxinus americana	WDL	Medium	18.5	27.1	1.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	41
swamp chestnut oak	Quercus michauxii	NSL	Low	15.3	26.2	2.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	42
bitternut hickory	Carya cordiformis	WSL	Low	11.5	25.2	1.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	43
eastern redcedar	Juniperus virginiana	WDH	Medium	10.4	24.1	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	44
mockernut hickory	Carya alba	WDL	Medium	19.2	22.7	0.9	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	45
post oak	Quercus stellata	WDH	High	11.9	20.3	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	46
swamp tupelo	Nyssa biflora	NDH	Medium	4	15.7	3.2	Sm. dec.	Sm. dec.	Low	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
red mulberry	Morus rubra	NSL	Low	10.9	11.3	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	48
Shumard oak	Quercus shumardii	NSL	Low	5.2	11.2	1.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	49
sassafras	Sassafras albidum	WSL	Low	7	11.0	0.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	50
river birch	Betula nigra	NSL	Low	3.1	9.8	2.0	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	51
chinkapin oak	Quercus muehlenbergii	NSL	Medium	3.4	9.8	2.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	52
laurel oak	Quercus laurifolia	NDH	Medium	2.9	9.7	2.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	53
bigleaf magnolia	Magnolia macrophylla	NSL	Low	7.9	7.2	0.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
longleaf pine	Pinus palustris	NSH	Medium	1.9	6.1	3.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	55
chestnut oak	Quercus prinus	NDH	High	0.2	6.1	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	56
northern red oak	Quercus rubra	WDH	Medium	3.8	5.9	1.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor		Infill +	2	57
florida maple	Acer barbatum	NSL	Low	5.9	5.9	0.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	58
American holly	Ilex opaca	NSL	Medium	8.1	5.5	0.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	59
sweetbay	Magnolia virginiana	NSL	Medium	2.7	5.2	1.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	60
black walnut	Juglans nigra	WDH	Low	3.3	5.2	1.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	61
pawpaw	Asimina triloba	NSL	Low	4.4	5.1	1.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	62
black oak	Quercus velutina	WDH	High	6.4	4.9	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +		2	63
Osage-orange	Maclura pomifera	NDH	Medium	2.2	4.5	1.4	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	64
cucumbertree	Magnolia acuminata	NSL	Low	2.9	4.2	1.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	65
eastern redbud	Cercis canadensis	NSL	Low	5.9	3.7	0.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	66
slash pine	Pinus elliotii	NDH	High	0.2	2.0	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	67
silver maple	Acer saccharinum	NSH	Low	0.4	1.9	0.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	68
shellbark hickory	Carya laciniosa	NSL	Low	0.9	0.7	0.8	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	69
Virginia pine	Pinus virginiana	NDH	High	0.2	0.7	0.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	70
paulownia	Paulownia tomentosa	NSL	FIA	0.9	0.6	0.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	71
American basswood	Tilia americana	WSL	Medium	0.5	0.6	0.3	Sm. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	72
serviceberry	Amelanchier spp.	NSL	Low	0.9	0.5	0.6	No change	No change	Medium	Rare	Poor	Poor			0	73
shagbark hickory	Carya ovata	WSL	Medium	0.6	0.5	0.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	74
redbay	Persea borbonia	NSL	Low	0.9	0.3	0.3	Sm. dec.	No change	High	Rare	Poor	Fair			0	75
scarlet oak	Quercus coccinea	WDL	Medium	0.9	0.3	0.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	76
hackberry	Celtis occidentalis	WDH	Medium	3.8	0.2	0.7	Lg. dec.	Lg. inc.	High	Rare	Poor	Good			2	77
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	78
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	80
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	81
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	82
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	83
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	84
silverbell	Halesia spp.	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	85
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	86
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	87
turkey oak	Quercus laevis	NSH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	88
bur oak	Quercus macrocarpa	NDH	Medium	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	89
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	90
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	91