

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 10,066 3,886.5 194

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	Medium	Low	FIA	RCP45	RCP85	RCP45	RCP85	RCP45	RCP85		
Ash	3			15	22	Increase		29	35	Very Good	15	15	Likely	1	1
Hickory	8			33	52	No Change		17	13	Good	11	12	Infill	23	25
Maple	4	Abundant	5	33	10	Decrease		17	15	Fair	15	20	Migrate	1	6
Oak	15	Common	30	4		New		14	15	Poor	15	11			
Pine	2	Rare	32			Unknown		8	7	Very Poor	4	4			
Other	35	Absent	16							FIA Only	4	4			
	67		83					85	85	Unknown	4	3			
											68	69			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099	
Annual	60.5	62.3	64.2	64.6	
Average	60.5	62.6	65.1	67.9	
GFDL45	60.5	64.1	65.4	66.4	
GFDL85	60.5	63.4	66.3	70.0	
HAD45	60.5	63.1	66.1	67.4	
HAD85	60.5	63.4	68.0	71.7	
Growing Season	76.0	77.8	79.3	79.9	
May—Sep	76.0	78.3	80.7	84.3	
GFDL45	76.0	80.4	81.8	83.5	
GFDL85	76.0	79.7	83.1	87.7	
HAD45	76.0	79.3	82.1	83.5	
HAD85	76.0	79.6	85.9	89.2	
Coldest Month	36.8	39.1	40.3	40.6	
Average	36.8	39.3	40.3	42.0	
GFDL45	36.8	40.9	41.1	41.3	
GFDL85	36.8	38.3	39.6	40.3	
HAD45	36.8	37.8	39.8	40.0	
HAD85	36.8	39.1	40.9	42.6	
Warmest Month	81.8	83.6	84.6	84.8	
Average	81.8	84.2	85.2	87.0	
GFDL45	81.8	86.3	87.2	88.3	
GFDL85	81.8	86.0	87.6	90.6	
HAD45	81.8	85.7	87.7	88.1	
HAD85	81.8	86.8	90.7	91.9	

Precipitation (in)

Scenario	2009	2039	2069	2099	
Annual	48.7	48.2	53.3	51.1	
Total	48.7	50.8	52.9	54.2	
GFDL45	48.7	53.7	57.2	55.9	
GFDL85	48.7	53.9	58.9	60.1	
HAD45	48.7	46.8	51.8	53.4	
HAD85	48.7	52.2	46.1	50.7	
Growing Season	17.7	16.6	17.5	17.2	
May—Sep	17.7	17.4	16.2	16.5	
GFDL45	17.7	19.4	19.4	20.1	
GFDL85	17.7	20.2	21.7	21.7	
HAD45	17.7	16.0	16.6	15.8	
HAD85	17.7	17.4	12.9	13.0	

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-DGP30 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
post oak	Quercus stellata	WDH	High	46.2	738.2	11.9	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	1
white oak	Quercus alba	WDH	Medium	53	657.9	10.3	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
black hickory	Carya texana	NDL	High	47.6	644.4	10.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
shortleaf pine	Pinus echinata	WDH	High	26.5	556.1	14.2	Sm. inc.	Sm. inc.	Medium	Abundant	Very Good	Very Good			1	4
eastern redcedar	Juniperus virginiana	WDH	Medium	40.3	539.7	9.7	No change	No change	Medium	Abundant	Good	Good			1	5
sweetgum	Liquidambar styraciflua	WDH	High	44.2	399.1	9.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	6
southern red oak	Quercus falcata	WDL	Medium	33.3	293.2	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	7
winged elm	Ulmus alata	WDL	Medium	56.6	284.3	4.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	8
black oak	Quercus velutina	WDH	High	30.5	259.5	6.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
loblolly pine	Pinus taeda	WDH	High	21.1	254.7	22.0	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	10
water oak	Quercus nigra	WDH	High	20.4	223.8	12.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	11
mockernut hickory	Carya alba	WDL	Medium	34.7	223.5	4.2	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	12
red maple	Acer rubrum	WDH	High	38.9	208.8	6.4	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	13
green ash	Fraxinus pennsylvanica	WSH	Low	49.7	197.1	7.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
willow oak	Quercus phellos	NSL	Low	19.8	182.5	7.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	15
blackgum	Nyssa sylvatica	WDL	Medium	34.1	159.6	3.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	16
slippery elm	Ulmus rubra	WSL	Low	27.4	150.9	5.7	No change	No change	Medium	Common	Fair	Fair			1	17
overcup oak	Quercus lyrata	NSL	Medium	23.5	134.8	8.2	No change	Sm. inc.	Low	Common	Poor	Fair	Infill +	Infill +	1	18
northern red oak	Quercus rubra	WDH	Medium	20.7	134.6	3.9	No change	No change	High	Common	Good	Good			1	19
black cherry	Prunus serotina	WDL	Medium	24.9	131.8	3.9	No change	Sm. inc.	Low	Common	Poor	Fair			1	20
sugarberry	Celtis laevigata	NDH	Medium	26.2	118.9	6.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	21
boxelder	Acer negundo	WSH	Low	7	103.4	12.8	No change	No change	High	Common	Good	Good			1	22
cherrybark oak; swamp red o	Quercus pagoda	NSL	Medium	15.1	93.9	3.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	23
black willow	Salix nigra	NSH	Low	8.8	91.5	13.8	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	24
bitternut hickory	Carya cordiformis	WSL	Low	15.7	87.9	5.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	25
white ash	Fraxinus americana	WDL	Medium	18.8	84.9	2.8	No change	Sm. inc.	Low	Common	Poor	Fair			1	26
silver maple	Acer saccharinum	NSH	Low	6.9	83.4	12.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	27
American elm	Ulmus americana	WDH	Medium	23.7	80.2	4.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	28
black locust	Robinia pseudoacacia	NDH	Low	6	79.2	11.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	29
blackjack oak	Quercus marilandica	NSL	Medium	13.7	73.9	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	30
bald cypress	Taxodium distichum	NSH	Medium	9.7	65.6	9.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	31
water tupelo	Nyssa aquatica	NSH	Medium	13.2	63.1	12.2	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	2	32
common persimmon	Diospyros virginiana	NSL	Low	30.2	62.7	2.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	33
nuttall oak	Quercus texana	NSH	Medium	18.8	60.0	13.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			0	34
shagbark hickory	Carya ovata	WSL	Medium	11	56.3	3.5	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	35
water elm	Planera aquatica	NSL	Low	13.1	46.4	6.1	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	36
flowering dogwood	Cornus florida	WDL	Medium	18.2	43.1	1.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	37
sassafras	Sassafras albidum	WSL	Low	14.5	41.5	2.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good			1	38
pignut hickory	Carya glabra	WDL	Medium	2.1	39.5	6.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	39
water hickory	Carya aquatica	NSL	Medium	11.9	37.8	4.5	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	40
waterlocust	Gleditsia aquatica	NSLX	FIA	13.3	35.4	4.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	41
chinkapin oak	Quercus muehlenbergii	NSL	Medium	9.6	33.9	3.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
river birch	Betula nigra	NSL	Low	5	31.4	16.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	43
pawpaw	Asimina triloba	NSL	Low	4	29.1	7.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	44
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	9.6	24.5	3.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair			1	45
black walnut	Juglans nigra	WDH	Low	7.5	22.7	2.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	46
florida maple	Acer barbatum	NSL	Low	3.7	21.2	2.9	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			1	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
honeylocust	Gleditsia triacanthos	NSH	Low	8	18.7	2.0	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	48
pecan	Carya illinoensis	NSH	Low	10.5	18.0	6.0	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	49
Shumard oak	Quercus shumardii	NSL	Low	4.6	16.8	1.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	50
hackberry	Celtis occidentalis	WDH	Medium	9.1	16.4	1.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	51
eastern redbud	Cercis canadensis	NSL	Low	8.3	15.6	1.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	52
sycamore	Platanus occidentalis	NSL	Low	5.3	13.7	2.2	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	53
serviceberry	Amelanchier spp.	NSL	Low	3.1	11.1	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
swamp chestnut oak	Quercus michauxii	NSL	Low	5.9	10.3	2.1	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	55
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	3	6.8	2.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	56
cedar elm	Ulmus crassifolia	NDH	Medium	2	6.6	3.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	57
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	4.2	4.5	0.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	58
red mulberry	Morus rubra	NSL	Low	4.5	4.3	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	2	59
wild plum	Prunus americana	NSLX	FIA	2.4	3.3	0.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	60
butternut	Juglans cinerea	NSLX	FIA	1	1.3	1.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	61
American holly	Ilex opaca	NSL	Medium	1	1.0	1.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	62
laurel oak	Quercus laurifolia	NDH	Medium	1	0.9	0.9	Very Lg. dec.	No change	Medium	Rare	Lost	Poor			0	63
American basswood	Tilia americana	WSL	Medium	1	0.7	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	64
shellbark hickory	Carya laciniosa	NSL	Low	0.6	0.6	0.4	Very Lg. dec.	Lg. dec.	Medium	Rare	Lost	Very Poor			0	65
eastern cottonwood	Populus deltoides	NSH	Low	4	0.6	2.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	66
Carolina ash	Fraxinus caroliniana	NSL	FIA	4	0.5	2.1	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	67
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	68
slash pine	Pinus elliottii	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	69
longleaf pine	Pinus palustris	NSH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	70
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	71
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	72
sugar maple	Acer saccharum	WDH	High	0	0	0	Unknown	Unknown	High	Modeled	Unknown	Unknown			0	73
Ohio buckeye	Aesculus glabra	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	74
American beech	Fagus grandifolia	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	75
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	76
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	77
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	78
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	79
sweetbay	Magnolia virginiana	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	80
swamp tupelo	Nyssa biflora	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	81
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	82
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	83
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	84
bluejack oak	Quercus incana	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	85