

Climate Change Atlas Tree Species
Current and Potential Future Habitat, Capability, and Migration

Area of Region sq. km sq. mi FIA Plots
153,599 59,305 532

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	13	21	Increase	11	12	Very Good	0	0
Hickory	6			Medium	25	41	No Change	22	23	Good	11	11
Maple	4	Abundant	0	Low	30	11	Decrease	15	13	Fair	10	12
Oak	10	Common	5	FIA	9		New	12	14	Poor	12	12
Pine	2	Rare	52				Unknown	17	15	Very Poor	15	13
Other	32	Absent	20							FIA Only	6	6
	57		77		77	73		77	77	Unknown	8	6
											62	60

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099
Annual	55.2	57.0	58.9	59.5
Average	55.2	57.6	59.8	62.6
GFDL45	55.2	61.2	60.1	61.4
GFDL85	55.2	58.0	61.0	65.2
HAD45	55.2	57.7	60.6	61.7
HAD85	55.2	58.0	62.9	65.9
Growing Season	73.0	75.2	77.2	77.9
May—Sep	73.0	81.1	79.1	81.3
GFDL45	73.0	81.1	79.1	81.3
GFDL85	73.0	76.7	80.2	85.5
HAD45	73.0	75.2	77.5	78.6
HAD85	73.0	75.8	80.9	83.6
Coldest Month	28.3	30.2	31.4	32.1
Average	28.3	30.7	31.4	33.1
GFDL45	28.3	32.1	32.4	32.6
GFDL85	28.3	30.2	31.6	32.6
HAD45	28.3	30.1	32.6	32.5
HAD85	28.3	32.1	34.7	36.4
Warmest Month	79.9	82.4	83.8	84.4
Average	79.9	83.5	84.8	86.7
GFDL45	79.9	84.1	85.3	86.9
GFDL85	79.9	84.3	85.7	89.8
HAD45	79.9	82.0	83.6	84.2
HAD85	79.9	83.8	86.2	87.7

Precipitation (in)

Scenario	2009	2039	2069	2099
Annual	32.4	31.8	32.5	31.5
Total	32.4	32.6	32.9	33.6
GFDL45	32.4	35.2	37.3	35.8
GFDL85	32.4	35.8	40.5	38.1
HAD45	32.4	35.4	34.6	35.6
HAD85	32.4	33.9	31.6	35.0
Growing Season	19.6	18.2	18.5	17.8
May—Sep	19.6	21.5	21.9	21.1
GFDL45	19.6	21.5	21.9	21.1
GFDL85	19.6	21.9	24.5	22.5
HAD45	19.6	20.6	21.1	21.1
HAD85	19.6	19.7	17.7	18.6

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
hackberry	Celtis occidentalis	WDH	Medium	39.3	104.2	18.3	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	2	1
American elm	Ulmus americana	WDH	Medium	43.5	100.1	15.9	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	2
Osage-orange	Maclura pomifera	NDH	Medium	28.6	94.2	22.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	3
eastern redcedar	Juniperus virginiana	WDH	Medium	25.4	62.0	14.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	4
green ash	Fraxinus pennsylvanica	WSH	Low	28.9	51.8	16.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	2	5
black walnut	Juglans nigra	WDH	Low	25	47.8	11.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	6
red mulberry	Morus rubra	NSL	Low	27	45.9	13.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	7
honeylocust	Gleditsia triacanthos	NSH	Low	22.9	40.3	14.9	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	8
post oak	Quercus stellata	WDH	High	3.2	29.4	28.4	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	9
chinkapin oak	Quercus muehlenbergii	NSL	Medium	8.8	24.2	10.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	10
eastern cottonwood	Populus deltoides	NSH	Low	11.2	23.2	22.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	11
bur oak	Quercus macrocarpa	NDH	Medium	10.6	22.3	12.8	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	12
black oak	Quercus velutina	WDH	High	2.7	11.3	8.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	13
slippery elm	Ulmus rubra	WSL	Low	10.7	11.1	4.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	14
pecan	Carya illinoensis	NSH	Low	3.9	10.6	10.6	Sm. inc.	Sm. inc.	Low	Rare	Poor	Poor	Infill +	Infill +	2	15
shagbark hickory	Carya ovata	WSL	Medium	5	10.6	6.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	16
black willow	Salix nigra	NSH	Low	5.9	10.5	14.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	17
boxelder	Acer negundo	WSH	Low	9.3	10.4	7.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	18
bitternut hickory	Carya cordiformis	WSL	Low	7.4	10.2	6.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	19
eastern redbud	Cercis canadensis	NSL	Low	9	9.8	5.1	No change	No change	Medium	Rare	Poor	Poor			0	20
northern red oak	Quercus rubra	WDH	Medium	5.5	8.9	7.5	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	21
pin oak	Quercus palustris	NSH	Low	2.6	8.1	10.1	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	22
sycamore	Platanus occidentalis	NSL	Low	4.7	7.9	7.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	23
Siberian elm	Ulmus pumila	NDH	FIA	4.4	7.5	23.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	24
sugar maple	Acer saccharum	WDH	High	0.6	6.9	15.9	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	25
silver maple	Acer saccharinum	NSH	Low	2.4	6.4	11.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	26
black locust	Robinia pseudoacacia	NDH	Low	1.6	4.8	25.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	27
white ash	Fraxinus americana	WDL	Medium	4.2	4.0	9.0	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	28
black cherry	Prunus serotina	WDL	Medium	4.7	3.9	2.8	No change	No change	Low	Rare	Very Poor	Very Poor			2	29
blackjack oak	Quercus marilandica	NSL	Medium	2.6	3.6	6.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	30
white mulberry	Morus alba	NSL	FIA	0.5	2.7	9.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	31
northern catalpa	Catalpa speciosa	NSHX	FIA	2.4	2.7	15.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
common persimmon	Diospyros virginiana	NSL	Low	2.6	2.4	3.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	33
Kentucky coffeetree	Gymnocladus dioicus	NSLX	FIA	5.7	2.3	3.9	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			2	34
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.2	2.1	25.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
sugarberry	Celtis laevigata	NDH	Medium	0.9	1.9	6.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	36
eastern hophornbeam; iron	Ostrya virginiana	WSL	Low	1.9	0.9	2.7	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	37
wild plum	Prunus americana	NSLX	FIA	2.5	0.9	4.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	38
white oak	Quercus alba	WDH	Medium	0.6	0.9	2.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	39
American basswood	Tilia americana	WSL	Medium	2	0.8	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
shellbark hickory	Carya laciniosa	NSL	Low	0.8	0.7	3.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
Shumard oak	Quercus shumardii	NSL	Low	1.3	0.5	2.5	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	42
flowering dogwood	Cornus florida	WDL	Medium	0.1	0.3	0.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	43
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0.6	0.2	2.1	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	44
black hickory	Carya texana	NDL	High	0.5	0.2	1.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
serviceberry	Amelanchier spp.	NSL	Low	0.1	0.2	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	46
chokecherry	Prunus virginiana	NSLX	FIA	0.3	0.2	11.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
shingle oak	Quercus imbricaria	NDH	Medium	0.3	0.2	2.2	No change	No change	Medium	Rare	Poor	Poor			0	48
eastern white pine	Pinus strobus	WDH	High	0.3	0.2	9.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	49
pawpaw	Asimina triloba	NSL	Low	0.8	0.1	2.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
mockernut hickory	Carya alba	WDL	Medium	0.3	0.1	3.7	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	51
Ohio buckeye	Aesculus glabra	NSL	Low	0.6	0.1	0.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	52
rock elm	Ulmus thomasii	NSLX	FIA	0.3	0.1	5.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	53
shortleaf pine	Pinus echinata	WDH	High	0.3	0.1	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	54
red maple	Acer rubrum	WDH	High	0	0.1	0.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	55
blue ash	Fraxinus quadrangulata	NSL	Low	0.3	0.0	2.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	56
ailanthus	Ailanthus altissima	NSL	FIA	0.2	0.0	0.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	57
Atlantic white-cedar	Chamaecyparis thyoides	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	58
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	NA	Absent	New Habitat	New Habitat			0	59
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++		3	60
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	61
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	62
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	64
black ash	Fraxinus nigra	WSH	Medium	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	65
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	67
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	68
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	69
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	70
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	72
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	73
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	74
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	76
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	77