

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

Area of Region sq. km sq. mi FIA Plots
 9,130.7 3,525.4 60

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	10	20	Increase	14	13	Very Good	5	7	Likely	0	0
Hickory	2			Medium	20	30	No Change	8	9	Good	11	9	Infill	22	22
Maple	4	Abundant	0	Low	25	8	Decrease	12	12	Fair	5	4	Migrate	7	16
Oak	7	Common	19	FIA	5		New	17	18	Poor	5	5			
Pine	1	Rare	20				Unknown	9	8	Very Poor	7	6			
Other	22	Absent	19							FIA Only	3	3			
	39		58		60	58		60	60	Unknown	4	3			
											40	37			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	47.0	49.1	51.7	52.0	
Average	CCSM85	47.0	49.8	52.5	55.8	
	GFDL45	47.0	53.0	52.4	53.7	
	GFDL85	47.0	50.2	53.6	58.2	
	HAD45	47.0	49.8	53.5	55.3	
	HAD85	47.0	50.5	55.1	60.0	
Growing Season	CCSM45	66.4	68.7	70.9	71.4	
	CCSM85	66.4	69.6	72.0	76.0	
May—Sep	GFDL45	66.4	74.0	72.9	75.0	
	GFDL85	66.4	70.5	74.3	79.9	
	HAD45	66.4	69.3	72.2	74.3	
	HAD85	66.4	69.7	74.8	79.5	
Coldest Month	CCSM45	15.6	17.5	20.0	20.3	
	CCSM85	15.6	18.2	20.0	22.2	
Average	GFDL45	15.6	19.1	20.3	20.8	
	GFDL85	15.6	19.1	20.8	22.7	
	HAD45	15.6	16.8	21.0	20.9	
	HAD85	15.6	20.1	23.6	26.6	
Warmest Month	CCSM45	72.5	74.9	76.4	77.0	
	CCSM85	72.5	76.5	78.3	80.4	
Average	GFDL45	72.5	76.0	77.4	79.2	
	GFDL85	72.5	77.0	78.8	82.7	
	HAD45	72.5	75.5	77.5	78.6	
	HAD85	72.5	76.9	79.9	83.1	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	36.1	35.5	35.7	35.5	
Total	CCSM85	36.1	34.9	36.0	36.3	
	GFDL45	36.1	38.6	42.2	40.8	
	GFDL85	36.1	39.8	42.9	42.4	
	HAD45	36.1	38.6	39.1	38.8	
	HAD85	36.1	37.5	36.4	39.1	
Growing Season	CCSM45	21.7	21.3	21.2	21.3	
	CCSM85	21.7	20.4	20.8	20.0	
May—Sep	GFDL45	21.7	22.6	24.7	23.3	
	GFDL85	21.7	23.6	24.3	23.1	
	HAD45	21.7	22.1	21.1	21.3	
	HAD85	21.7	21.2	18.9	19.0	

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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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
American elm	Ulmus americana	WDH	Medium	64.4	408.5	12.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	1
black walnut	Juglans nigra	WDH	Low	44.3	196.6	8.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	2
sugar maple	Acer saccharum	WDH	High	25	151.5	7.7	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	3
silver maple	Acer saccharinum	NSH	Low	16.3	145.2	15.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	4
northern red oak	Quercus rubra	WDH	Medium	19.2	120.8	10.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	2	5
American basswood	Tilia americana	WSL	Medium	34.2	112.3	9.6	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	6
white ash	Fraxinus americana	WDL	Medium	25.5	108.2	8.8	Sm. dec.	No change	Low	Common	Poor	Poor	Infill +	Infill +	2	7
boxelder	Acer negundo	WSH	Low	35.8	103.2	8.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
white oak	Quercus alba	WDH	Medium	23	95.8	10.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	9
eastern redcedar	Juniperus virginiana	WDH	Medium	27.4	95.5	10.2	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	10
slippery elm	Ulmus rubra	WSL	Low	37.8	79.8	4.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	11
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	33.8	76.3	4.3	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	12
bur oak	Quercus macrocarpa	NDH	Medium	15.4	72.6	9.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	2	13
green ash	Fraxinus pennsylvanica	WSH	Low	21.1	69.4	7.3	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good	Infill ++	Infill ++	1	14
shagbark hickory	Carya ovata	WSL	Medium	28.7	67.7	5.9	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	15
black cherry	Prunus serotina	WDL	Medium	30.5	65.9	3.8	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair	Infill +	Infill +	1	16
hackberry	Celtis occidentalis	WDH	Medium	40.5	63.7	5.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	17
red mulberry	Morus rubra	NSL	Low	16.1	62.0	8.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	18
bitternut hickory	Carya cordiformis	WSL	Low	33.4	60.0	4.6	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
black maple	Acer nigrum	NSH	Low	5.8	45.2	12.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	20
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.5	39.5	11.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
swamp white oak	Quercus bicolor	NSL	Low	2.1	30.9	7.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	22
wild plum	Prunus americana	NSLX	FIA	2.4	26.0	7.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	23
Siberian elm	Ulmus pumila	NDH	FIA	13.8	22.2	19.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	24
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	7	19.1	2.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	25
northern pin oak	Quercus ellipsoidalis	NSH	Medium	8.2	14.7	8.2	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	26
eastern cottonwood	Populus deltoides	NSH	Low	2.9	14.3	3.8	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	27
black ash	Fraxinus nigra	WSH	Medium	7.3	12.6	1.4	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost			0	28
white mulberry	Morus alba	NSL	FIA	1.8	11.5	3.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	29
quaking aspen	Populus tremuloides	WDH	High	10.9	10.4	3.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	30
bigtooth aspen	Populus grandidentata	NSL	Medium	3.9	8.4	2.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
black oak	Quercus velutina	WDH	High	11.2	7.6	3.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	32
honeylocust	Gleditsia triacanthos	NSH	Low	4.7	5.0	1.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	33
black locust	Robinia pseudoacacia	NDH	Low	1.7	4.2	1.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	34
eastern white pine	Pinus strobus	WDH	High	0.3	4.0	1.0	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	35
river birch	Betula nigra	NSL	Low	4.4	2.0	7.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
chokecherry	Prunus virginiana	NSLX	FIA	5.8	0.7	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	37
paper birch	Betula papyrifera	WDH	High	1	0.5	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
butternut	Juglans cinerea	NSLX	FIA	4.4	0.4	1.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	39
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	40
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	41
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	42
gray birch	Betula populifolia	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	43
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			3	44
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	45
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	46
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	47



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mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	50
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	51
American beech	<i>Fagus grandifolia</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	52
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	53
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	55
shingle oak	<i>Quercus imbricaria</i>	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	57
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	58
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	59
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	60