

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	9,273.2	3,580.4	44

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	5	18	Increase	13	10	Very Good	1	0	Likely	0	0
Hickory	3			Medium	20	27	No Change	7	12	Good	9	8	Infill	21	23
Maple	4	Abundant	0	Low	25	6	Decrease	14	12	Fair	8	9	Migrate	6	12
Oak	7	Common	4	FIA	2		New	12	13	Poor	7	10		27	35
Pine	0	Rare	32				Unknown	6	5	Very Poor	9	7			
Other	19	Absent	14					52	52	FIA Only	1	1			
	36		50		52	51				Unknown	4	3			
											39	38			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	50.2	52.2	54.6	54.9	
	CCSM85	50.2	53.0	55.5	58.6	
	GFDL45	50.2	56.7	55.5	56.7	
	GFDL85	50.2	53.3	56.6	60.9	
	HAD45	50.2	52.9	56.4	58.2	
	HAD85	50.2	53.4	58.1	62.6	
Growing Season (May—Sep)	CCSM45	69.0	71.4	73.4	74.1	
	CCSM85	69.0	72.5	74.8	78.3	
	GFDL45	69.0	77.3	75.4	77.4	
	GFDL85	69.0	73.0	76.7	82.1	
	HAD45	69.0	71.9	74.7	76.8	
	HAD85	69.0	72.3	77.5	81.9	
Coldest Month Average	CCSM45	19.5	21.4	23.7	24.1	
	CCSM85	19.5	22.1	23.8	25.7	
	GFDL45	19.5	23.2	24.1	24.6	
	GFDL85	19.5	22.9	24.5	26.1	
	HAD45	19.5	20.8	24.5	24.5	
	HAD85	19.5	23.8	27.0	29.7	
Warmest Month Average	CCSM45	75.2	77.5	78.9	79.6	
	CCSM85	75.2	79.2	80.9	82.6	
	GFDL45	75.2	78.7	80.2	81.8	
	GFDL85	75.2	79.6	81.2	84.9	
	HAD45	75.2	78.0	80.1	81.1	
	HAD85	75.2	79.5	82.7	85.3	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	36.3	35.1	35.9	35.5	
	CCSM85	36.3	34.8	35.6	36.0	
	GFDL45	36.3	38.9	41.8	41.6	
	GFDL85	36.3	39.7	44.1	43.4	
	HAD45	36.3	39.4	39.7	39.9	
	HAD85	36.3	38.3	37.3	39.7	
Growing Season (May—Sep)	CCSM45	21.1	20.4	20.7	20.0	
	CCSM85	21.1	19.4	19.5	19.3	
	GFDL45	21.1	21.8	23.1	22.7	
	GFDL85	21.1	22.7	24.2	22.9	
	HAD45	21.1	21.8	20.6	21.4	
	HAD85	21.1	21.2	18.9	18.8	

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
silver maple	Acer saccharinum	NSH	Low	47	133.9	18.1	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	1
American elm	Ulmus americana	WDH	Medium	70	75.0	9.3	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	2
hackberry	Celtis occidentalis	WDH	Medium	48	68.4	13.3	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	3
boxelder	Acer negundo	WSH	Low	41.6	64.3	12.7	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	4
shagbark hickory	Carya ovata	WSL	Medium	36.5	45.9	12.8	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	5
red mulberry	Morus rubra	NSL	Low	33.8	45.8	11.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	6
black cherry	Prunus serotina	WDL	Medium	48.4	40.7	9.1	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	7
black walnut	Juglans nigra	WDH	Low	38.3	31.1	4.3	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	8
slippery elm	Ulmus rubra	WSL	Low	38.1	29.5	6.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	1	9
American basswood	Tilia americana	WSL	Medium	15.8	24.9	8.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	10
bitternut hickory	Carya cordiformis	WSL	Low	22.5	24.7	10.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	11
white oak	Quercus alba	WDH	Medium	17.6	22.0	6.9	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	12
bur oak	Quercus macrocarpa	NDH	Medium	15	19.4	9.9	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	13
black willow	Salix nigra	NSH	Low	12.5	19.3	15.8	Sm. dec.	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	14
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	32.1	19.3	2.5	No change	Sm. dec.	High	Rare	Fair	Poor	Infill +	Infill +	1	15
northern red oak	Quercus rubra	WDH	Medium	20.4	18.3	6.7	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	2	16
eastern cottonwood	Populus deltoides	NSH	Low	8	16.9	6.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	17
honeylocust	Gleditsia triacanthos	NSH	Low	26.4	16.6	6.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	18
black oak	Quercus velutina	WDH	High	13.1	14.8	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	19
green ash	Fraxinus pennsylvanica	WSH	Low	25.8	13.6	2.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	20
eastern redcedar	Juniperus virginiana	WDH	Medium	13.9	11.5	5.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	21
black locust	Robinia pseudoacacia	NDH	Low	8.6	11.3	8.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	22
Siberian elm	Ulmus pumila	NDH	FIA	8	11.0	20.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	23
mockernut hickory	Carya alba	WDL	Medium	1.2	9.2	1.8	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	2	24
Osage-orange	Maclura pomifera	NDH	Medium	7.5	9.0	16.5	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	25
black maple	Acer nigrum	NSH	Low	7	7.8	10.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	26
white ash	Fraxinus americana	WDL	Medium	22.9	7.5	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	27
black ash	Fraxinus nigra	WSH	Medium	0.1	5.1	0.5	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	28
wild plum	Prunus americana	NSLX	FIA	11.6	5.1	5.3	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
shingle oak	Quercus imbricaria	NDH	Medium	8.2	3.5	2.2	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	30
river birch	Betula nigra	NSL	Low	12.9	2.5	3.1	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
northern pin oak	Quercus ellipsoidalis	NSH	Medium	3.9	2.1	1.0	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			0	32
swamp white oak	Quercus bicolor	NSL	Low	5	1.7	1.1	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	33
Ohio buckeye	Aesculus glabra	NSL	Low	0.8	1.0	0.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
serviceberry	Amelanchier spp.	NSL	Low	4.3	0.9	3.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
sugar maple	Acer saccharum	WDH	High	4.3	0.8	3.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	36
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat		Migrate +	3	37
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	38
pignut hickory	Carya glabra	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	39
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	40
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	41
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	42
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	43
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	44
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	45
quaking aspen	Populus tremuloides	WDH	High	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	46
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	47



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chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	48
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate ++	Migrate +	3	49
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	50
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	51
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	52