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	119

Species Information

The columns below provide breif 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 Reliability	Adaptability	Potential Change in Habitat Suitability	Scenario RCP45	Scenario RCP85	Capability to Cope or Persist	Scenario RCP45	Scenario RCP85	Migration Potential	SHIFT RCP45	SHIFT RCP85
Ash	4														
Hickory	4		Abundance		Reliability	Adaptability		RCP45	RCP85		RCP45	RCP85		RCP45	RCP85
Maple	6	Abundant	0	High	12	20	Increase	15	13	Very Good	3	2	Likely	0	0
Oak	7	Common	26	Medium	22	35	No Change	12	10	Good	14	12	Infill	12	14
Pine	3	Rare	32	Low	29	10	Decrease	23	27	Fair	8	10	Migrate	2	7
Other	34	Absent	12	FIA	8		New	10	10	Poor	9	10		14	21
	58		**70**		**71**	**65**	Unknown	11	11	Very Poor	16	15			
								71	**71**	FIA Only	2	2			
										Unknown	3	3			
											55	**54**			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	49.5	51.3	53.9	54.1	
Average	CCSM85	49.5	52.1	54.7	57.8	
	GFDL45	49.5	54.3	55.1	56.1	
	GFDL85	49.5	52.6	56.1	60.4	
	HAD45	49.5	52.5	56.1	57.8	
	HAD85	49.5	52.8	57.5	62.5	
Growing	CCSM45	67.1	68.9	71.2	71.7	
Season	CCSM85	67.1	69.9	72.3	76.0	
May—Sep	GFDL45	67.1	72.9	73.8	75.3	
	GFDL85	67.1	70.9	75.1	80.2	
	HAD45	67.1	70.5	73.4	75.6	
	HAD85	67.1	70.4	75.9	81.2	
Coldest	CCSM45	21.9	23.5	25.8	25.8	
Month	CCSM85	21.9	24.4	26.1	27.9	
Average	GFDL45	21.9	25.3	26.2	26.8	
	GFDL85	21.9	25.1	26.4	27.8	
	HAD45	21.9	23.4	26.9	26.9	
	HAD85	21.9	25.5	28.2	31.2	
Warmest	CCSM45	72.9	74.7	76.3	76.8	
Month	CCSM85	72.9	76.3	78.1	80.0	
Average	GFDL45	72.9	75.9	77.7	78.8	
	GFDL85	72.9	77.0	79.0	82.1	
	HAD45	72.9	76.7	79.0	80.2	
	HAD85	72.9	77.7	81.5	85.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual	CCSM45	37.6	36.9	36.7	37.2	
Total	CCSM85	37.6	37.7	37.3	38.5	
	GFDL45	37.6	40.1	44.2	44.9	
	GFDL85	37.6	40.2	45.4	47.0	
	HAD45	37.6	38.5	40.7	40.0	
	HAD85	37.6	40.5	37.7	40.6	
Growing	CCSM45	19.0	19.0	18.5	17.9	
Season	CCSM85	19.0	17.9	18.0	17.4	
May—Sep	GFDL45	19.0	19.8	21.3	22.1	
	GFDL85	19.0	20.4	21.6	21.7	
	HAD45	19.0	19.1	18.0	18.7	
	HAD85	19.0	18.9	15.7	16.4	

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	38.6	440.8	16.4	No change	Sm. dec.	High	Common	Good	Fair			1	1
black cherry	Prunus serotina	WDL	Medium	77.3	424.2	11.1	No change	Sm. dec.	Low	Common	Poor	Poor			0	2
red maple	Acer rubrum	WDH	High	44.2	376.2	12.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	3
American elm	Ulmus americana	WDH	Medium	80.7	356.1	6.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	4
sugar maple	Acer saccharum	WDH	High	56.1	320.9	13.1	No change	Sm. dec.	High	Common	Good	Fair			1	5
black oak	Quercus velutina	WDH	High	25	230.3	9.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	6
green ash	Fraxinus pennsylvanica	WSH	Low	49.9	228.1	6.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	7
black walnut	Juglans nigra	WDH	Low	53.1	202.1	6.3	No change	No change	Medium	Common	Fair	Fair			1	8
eastern white pine	Pinus strobus	WDH	High	9.3	182.4	19.6	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	9
sassafras	Sassafras albidum	WSL	Low	32	177.8	8.0	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
white ash	Fraxinus americana	WDL	Medium	55.9	175.3	4.4	Sm. inc.	No change	Low	Common	Fair	Poor			1	11
hackberry	Celtis occidentalis	WDH	Medium	55	148.1	5.2	No change	No change	High	Common	Good	Good			1	12
northern red oak	Quercus rubra	WDH	Medium	41.8	143.5	5.2	Sm. inc.	No change	High	Common	Very Good	Good			1	13
eastern cottonwood	Populus deltoides	NSH	Low	27.3	142.5	9.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
American basswood	Tilia americana	WSL	Medium	32.5	140.2	5.9	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
shagbark hickory	Carya ovata	WSL	Medium	44.5	122.5	4.9	No change	Lg. dec.	Medium	Common	Fair	Poor			1	16
black willow	Salix nigra	NSH	Low	12.5	117.7	14.1	Lg. dec.	Sm. dec.	Low	Common	Very Poor	Poor		Infill +	0	17
bitternut hickory	Carya cordiformis	WSL	Low	42.7	101.4	5.4	No change	Sm. dec.	High	Common	Good	Fair			1	18
Siberian elm	Ulmus pumila	NDH	FIA	12.3	91.1	13.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
white oak	Quercus alba	WDH	Medium	22.7	73.3	5.0	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	20
pignut hickory	Carya glabra	WDL	Medium	26.4	67.9	4.6	Sm. inc.	No change	Medium	Common	Good	Fair	Infill ++	Infill +	1	21
boxelder	Acer negundo	WSH	Low	34.2	63.5	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	22
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	39.7	61.5	3.0	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	23
bigtooth aspen	Populus grandidentata	NSL	Medium	7.9	56.2	8.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
Scots pine	Pinus sylvestris	NSH	FIA	7.5	55.2	12.5	Unknown	Unknown	NA	Common	NNIS	NNIS			0	25
red pine	Pinus resinosa	NSH	Medium	7.4	51.8	11.9	Sm. dec.	Lg. dec.	Low	Common	Poor	Very Poor			0	26
slippery elm	Ulmus rubra	WSL	Low	45.7	48.1	4.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			1	27
swamp white oak	Quercus bicolor	NSL	Low	6.8	44.7	3.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	28
yellow-poplar	Liriodendron tulipifera	WDH	High	30.4	44.3	4.6	Sm. inc.	No change	High	Rare	Good	Fair	Infill ++	Infill +	1	29
red mulberry	Morus rubra	NSL	Low	32	38.9	3.0	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
American beech	Fagus grandifolia	WDH	High	32.4	26.7	4.2	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	31
pin oak	Quercus palustris	NSH	Low	11.8	26.4	3.1	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	32
black ash	Fraxinus nigra	WSH	Medium	12.6	20.1	3.3	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	33
sycamore	Platanus occidentalis	NSL	Low	10.7	16.3	4.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	34
yellow birch	Betula alleghaniensis	NDL	High	2.6	16.0	2.3	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	35
white mulberry	Morus alba	NSL	FIA	19	15.6	2.2	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	36
ailanthus	Ailanthus altissima	NSL	FIA	1.4	14.3	5.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	37
flowering dogwood	Cornus florida	WDL	Medium	8.9	11.8	1.9	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	38
black locust	Robinia pseudoacacia	NDH	Low	5.6	11.8	5.3	No change	Lg. inc.	Medium	Rare	Poor	Good	Infill +	Infill ++	2	39
quaking aspen	Populus tremuloides	WDH	High	0.4	11.7	4.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	40
Norway maple	Acer platanoides	NSL	FIA	1	10.5	9.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	41
bur oak	Quercus macrocarpa	NDH	Medium	24.7	10.3	1.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	42
northern catalpa	Catalpa speciosa	NSHX	FIA	7.1	9.3	13.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
Osage-orange	Maclura pomifera	NDH	Medium	1.6	9.0	4.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	44
blackgum	Nyssa sylvatica	WDL	Medium	3.2	7.6	2.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	45
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	17.1	7.5	1.6	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	46
shellbark hickory	Carya laciniosa	NSL	Low	1.1	7.4	6.9	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	47

S41 E85

Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
eastern redbud	Cercis canadensis	NSL	Low	1.1	6.2	5.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	48
blue ash	Fraxinus quadrangulata	NSL	Low	12.4	6.1	1.8	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	49
tamarack (native)	Larix laricina	NSH	High	1.1	5.8	5.4	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	50
pawpaw	Asimina triloba	NSL	Low	5.4	5.1	2.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	51
Norway spruce	Picea abies	NSH	FIA	1.1	5.1	4.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	52
eastern redcedar	Juniperus virginiana	WDH	Medium	7.5	5.0	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	53
Ohio buckeye	Aesculus glabra	NSL	Low	21.9	3.0	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	54
chinkapin oak	Quercus muehlenbergii	NSL	Medium	5.1	2.5	0.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	55
chokecherry	Prunus virginiana	NSLX	FIA	5.4	2.0	2.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	56
black maple	Acer nigrum	NSH	Low	1.1	1.7	1.6	Lg. dec.	Very Lg. dec.	High	Rare	Poor	Lost			0	57
honeylocust	Gleditsia triacanthos	NSH	Low	0.8	0.8	0.1	Lg. inc.	Sm. inc.	High	Rare	Good	Good			2	58
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	59
pecan	Carya illinoinensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	60
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	61
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	62
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	63
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	64
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	65
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	67
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	68
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	69
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	70
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	71