

	sq. km	sq. mi	FIA Plots
Area of Region	39,138	15,111	464

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	Increase	RCP45	RCP85	Very Good	Good	Fair	Poor	RCP45	RCP85
Ash	3			8	14	5	8	0	0	Likely	2	2	2	2
Hickory	5			17	32	No Change	11	11	6	8	Infill	14	14	
Maple	1	Abundant	2	21	4	Decrease	22	19	7	8	Migrate	0	0	
Oak	10	Common	8	5		New	2	2	12	10				
Pine	1	Rare	33			Unknown	11	11	5	5				
Other	23	Absent	7	51	50		51	51	6	6			16	16
									Very Poor	13	12			
									FIA Only	5	5			
									Unknown	6	6			
										49	49			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	64.7	66.1	67.6	68.3	
	CCSM85	64.7	66.7	68.7	71.2	
	GFDL45	64.7	69.5	68.9	70.5	
	GFDL85	64.7	67.5	70.5	74.2	
	HAD45	64.7	66.8	69.3	70.2	
HAD85	64.7	67.2	71.0	74.1		
Growing Season (May—Sep)	CCSM45	78.8	80.1	81.5	82.3	
	CCSM85	78.8	81.0	82.8	85.9	
	GFDL45	78.8	85.1	83.9	86.6	
	GFDL85	78.8	82.7	86.2	90.9	
	HAD45	78.8	81.0	83.1	83.7	
HAD85	78.8	81.5	85.6	88.4		
Coldest Month Average	CCSM45	43.4	45.6	46.3	46.8	
	CCSM85	43.4	45.5	46.5	47.8	
	GFDL45	43.4	46.8	46.8	47.0	
	GFDL85	43.4	44.4	45.6	45.9	
	HAD45	43.4	43.8	45.8	46.1	
HAD85	43.4	46.4	48.0	49.6		
Warmest Month Average	CCSM45	84.2	85.2	86.1	86.4	
	CCSM85	84.2	86.2	86.8	88.6	
	GFDL45	84.2	89.3	89.6	91.4	
	GFDL85	84.2	89.4	91.1	94.9	
	HAD45	84.2	86.4	87.5	87.7	
HAD85	84.2	87.2	89.3	90.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	34.4	35.2	35.4	33.9	
	CCSM85	34.4	33.5	36.9	35.9	
	GFDL45	34.4	34.6	40.1	33.0	
	GFDL85	34.4	34.1	36.7	35.1	
	HAD45	34.4	34.9	34.2	35.8	
HAD85	34.4	35.1	31.3	34.3		
Growing Season (May—Sep)	CCSM45	16.0	17.5	15.9	16.0	
	CCSM85	16.0	16.1	16.5	15.4	
	GFDL45	16.0	16.5	19.6	15.8	
	GFDL85	16.0	16.7	17.8	16.7	
	HAD45	16.0	15.8	15.4	16.4	
HAD85	16.0	15.7	13.1	14.7		

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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Section 255E

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Climate Change Atlas Tree Species

USDA Forest Service
Northern Research Station
Landscape Change Research Group
Iverson, Peters, Prasad, Matthews

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
ashe juniper	Juniperus ashei	NDH	High	51.8	1146.0	42.1	No change	No change	Medium	Abundant	Good	Good			0	1
post oak	Quercus stellata	WDH	High	42.6	625.2	22.9	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
live oak	Quercus virginiana	NDH	High	49.5	467.7	17.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	3
cedar elm	Ulmus crassifolia	NDH	Medium	59.9	298.4	12.4	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	4
sugarberry	Celtis laevigata	NDH	Medium	40.7	110.9	7.9	Sm. dec.	No change	Medium	Common	Poor	Fair			1	5
blackjack oak	Quercus marilandica	NSL	Medium	24	80.9	7.8	No change	No change	High	Common	Good	Good			1	6
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	23.2	77.9	6.6	No change	No change	High	Common	Good	Good			1	7
American elm	Ulmus americana	WDH	Medium	27	68.0	8.5	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	8
eastern redcedar	Juniperus virginiana	WDH	Medium	19.3	55.2	8.2	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	2	9
pecan	Carya illinoensis	NSH	Low	27.1	50.6	8.1	No change	Sm. inc.	Low	Common	Poor	Fair			1	10
hackberry	Celtis occidentalis	WDH	Medium	17.4	44.3	6.9	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	11
bur oak	Quercus macrocarpa	NDH	Medium	6.8	29.8	6.1	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor	Infill +		2	12
black willow	Salix nigra	NSH	Low	10.6	28.6	10.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	13
winged elm	Ulmus alata	WDL	Medium	11.7	24.1	6.8	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	14
Osage-orange	Maclura pomifera	NDH	Medium	15.6	20.9	5.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +	Infill ++	2	15
red mulberry	Morus rubra	NSL	Low	6.8	18.0	7.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	16
green ash	Fraxinus pennsylvanica	WSH	Low	14.7	17.4	4.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	17
Texas ash	Fraxinus texensis	NDH	FIA	14.3	16.6	3.5	Unknown	Unknown	NA	Rare	FIA Only	FIA Only			0	18
Shumard oak	Quercus shumardii	NSL	Low	11.9	16.0	3.7	Lg. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	19
durand oak	Quercus sinuata var. sinuata	NSL	FIA	3.6	11.2	6.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	20
honeylocust	Gleditsia triacanthos	NSH	Low	11	11.2	5.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	21
sycamore	Platanus occidentalis	NSL	Low	1.8	10.5	10.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	22
mockernut hickory	Carya alba	WDL	Medium	1.1	8.9	11.6	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	23
eastern cottonwood	Populus deltoides	NSH	Low	8.1	8.9	10.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	24
black hickory	Carya texana	NDL	High	3.9	6.7	3.4	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	25
slippery elm	Ulmus rubra	WSL	Low	4.7	6.1	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	26
common persimmon	Diospyros virginiana	NSL	Low	1.2	5.6	4.5	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	27
chinkapin oak	Quercus muehlenbergii	NSL	Medium	1.8	4.3	7.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	28
boxelder	Acer negundo	WSH	Low	2.5	3.4	7.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	29
bitternut hickory	Carya cordiformis	WSL	Low	0.3	2.0	7.7	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	30
sweetgum	Liquidambar styraciflua	WDH	High	0.2	1.8	4.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	31
waterlocust	Gleditsia aquatica	NSLX	FIA	1.1	1.6	25.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
white ash	Fraxinus americana	WDL	Medium	2.7	1.6	2.6	No change	No change	Low	Rare	Very Poor	Very Poor			2	33
eastern redbud	Cercis canadensis	NSL	Low	7.1	1.6	1.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	34
black walnut	Juglans nigra	WDH	Low	3.5	1.5	4.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
water elm	Planera aquatica	NSL	Low	1.1	1.3	20.0	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	36
black oak	Quercus velutina	WDH	High	0.9	0.6	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
black locust	Robinia pseudoacacia	NDH	Low	0.8	0.6	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	38
northern red oak	Quercus rubra	WDH	Medium	2.2	0.6	2.0	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	39
loblolly pine	Pinus taeda	WDH	High	0.6	0.3	2.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			0	40
shagbark hickory	Carya ovata	WSL	Medium	0.8	0.2	2.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	41
wild plum	Prunus americana	NSLX	FIA	2.2	0.1	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	42
bear oak; scrub oak	Quercus ilicifolia	NSLX	FIA	0.2	0.1	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	43
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	44
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	45
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	46
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			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
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	48
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	49
sassafras	Sassafras albidum	WSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	50
American basswood	Tilia americana	WSL	Medium	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	51