

### Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	13,900	5,366.9	180

### 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	23	Increase	RCP45	RCP85	Very Good	7	6	Likely	0	0
Ash	4			Medium	29	No Change	15	14	Good	8	12	Infill	35	36
Hickory	5			Low	31	Decrease	22	23	Fair	14	10	Migrate	6	10
Maple	5	Abundant	0	FIA	5	New	14	14	Poor	12	13			
Oak	10	Common	23			Unknown	9	9	Very Poor	13	12			
Pine	3	Rare	37						FIA Only	2	2			
Other	33	Absent	18						Unknown	4	4			
	<b>60</b>		<b>78</b>				<b>78</b>	<b>78</b>		<b>60</b>	<b>59</b>			

### Potential Changes in Climate Variables

#### Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	46.6	47.8	49.6	49.8	
Average	CCSM85	46.6	48.3	50.2	52.5	
	GFDL45	46.6	49.7	50.8	51.4	
	GFDL85	46.6	48.9	51.5	54.6	
	HAD45	46.6	48.7	51.4	52.5	
	HAD85	46.6	49.1	52.5	55.9	
Growing Season	CCSM45	59.2	60.4	62.0	62.4	
	CCSM85	59.2	61.0	62.9	65.8	
May—Sep	GFDL45	59.2	62.9	64.2	65.2	
	GFDL85	59.2	62.1	65.3	68.8	
	HAD45	59.2	61.7	64.2	65.7	
	HAD85	59.2	61.9	66.4	70.0	
Coldest Month	CCSM45	26.8	27.8	29.1	29.4	
	CCSM85	26.8	28.8	29.6	30.9	
Average	GFDL45	26.8	29.5	29.9	30.4	
	GFDL85	26.8	28.9	29.8	30.5	
	HAD45	26.8	27.6	29.7	29.7	
	HAD85	26.8	28.7	30.5	32.2	
Warmest Month	CCSM45	63.4	64.6	65.6	66.0	
	CCSM85	63.4	65.4	66.7	68.2	
Average	GFDL45	63.4	65.8	67.2	67.9	
	GFDL85	63.4	66.3	68.2	70.3	
	HAD45	63.4	66.2	68.3	69.1	
	HAD85	63.4	67.4	70.6	72.9	

#### Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	30.6	31.1	32.4	32.5	
Total	CCSM85	30.6	31.5	32.3	33.9	
	GFDL45	30.6	33.9	35.9	37.4	
	GFDL85	30.6	32.2	36.6	38.5	
	HAD45	30.6	32.1	32.8	32.6	
	HAD85	30.6	32.1	30.2	32.9	
Growing Season	CCSM45	14.4	14.6	14.7	14.6	
	CCSM85	14.4	13.7	13.8	13.8	
May—Sep	GFDL45	14.4	15.8	15.5	16.2	
	GFDL85	14.4	14.7	15.5	15.7	
	HAD45	14.4	14.9	13.3	14.0	
	HAD85	14.4	14.3	11.9	12.1	

**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
white ash	Fraxinus americana	WDL	Medium	83.5	476.3	11.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	1
sugar maple	Acer saccharum	WDH	High	68.9	388.7	9.2	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	2
American elm	Ulmus americana	WDH	Medium	79.9	302.9	7.5	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	3
black walnut	Juglans nigra	WDH	Low	68.3	277.6	8.7	No change	Sm. dec.	Medium	Common	Fair	Poor	Infill +	Infill +	1	4
black locust	Robinia pseudoacacia	NDH	Low	25.3	225.9	9.6	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	5
black cherry	Prunus serotina	WDL	Medium	70.8	189.3	5.0	No change	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	6
Osage-orange	Maclura pomifera	NDH	Medium	43.9	170.3	7.1	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	7
hackberry	Celtis occidentalis	WDH	Medium	61.3	151.3	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	8
honeylocust	Gleditsia triacanthos	NSH	Low	35.4	107.5	6.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	9
bitternut hickory	Carya cordiformis	WSL	Low	43.6	100.3	3.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	10
slippery elm	Ulmus rubra	WSL	Low	50.6	95.9	2.8	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	11
boxelder	Acer negundo	WSH	Low	38.5	95.7	4.9	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	12
shagbark hickory	Carya ovata	WSL	Medium	33.9	94.9	5.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	13
yellow-poplar	Liriodendron tulipifera	WDH	High	16.2	87.9	5.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair	Infill +	Infill +	1	14
sycamore	Platanus occidentalis	NSL	Low	34.6	84.5	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	1	15
northern red oak	Quercus rubra	WDH	Medium	42.1	80.8	4.7	Sm. inc.	No change	High	Common	Very Good	Good	Infill ++	Infill ++	1	16
Ohio buckeye	Aesculus glabra	NSL	Low	36.3	80.4	2.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	17
green ash	Fraxinus pennsylvanica	WSH	Low	39.7	75.7	5.1	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	18
eastern redcedar	Juniperus virginiana	WDH	Medium	24	73.0	5.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	19
eastern cottonwood	Populus deltoides	NSH	Low	19.3	66.9	5.9	No change	Sm. inc.	Medium	Common	Fair	Good	Infill +	Infill ++	1	20
American beech	Fagus grandifolia	WDH	High	21.7	63.6	3.6	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	21
black oak	Quercus velutina	WDH	High	13	59.8	4.8	Sm. inc.	Sm. inc.	Medium	Common	Good	Good	Infill ++	Infill ++	2	22
white oak	Quercus alba	WDH	Medium	24.8	53.4	4.2	Lg. inc.	Sm. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	23
chinkapin oak	Quercus muehlenbergii	NSL	Medium	26.6	44.8	2.4	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	24
American basswood	Tilia americana	WSL	Medium	31.4	36.6	4.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	25
silver maple	Acer saccharinum	NSH	Low	11.2	34.8	5.3	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	26
white mulberry	Morus alba	NSL	FIA	26	31.8	5.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	27
blue ash	Fraxinus quadrangulata	NSL	Low	22.4	28.3	2.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	28
red maple	Acer rubrum	WDH	High	11.5	27.4	2.1	Sm. inc.	Sm. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	29
sassafras	Sassafras albidum	WSL	Low	5.4	24.2	2.3	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	30
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	23.9	23.4	1.8	Sm. dec.	No change	High	Rare	Poor	Fair	Infill +	Infill +	1	31
swamp white oak	Quercus bicolor	NSL	Low	13.1	20.6	10.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	32
eastern redbud	Cercis canadensis	NSL	Low	26.8	19.8	1.2	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	33
black maple	Acer nigrum	NSH	Low	3.4	19.3	11.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	34
pignut hickory	Carya glabra	WDL	Medium	11.6	18.8	2.1	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	35
eastern white pine	Pinus strobus	WDH	High	1.4	17.5	11.4	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	36
black willow	Salix nigra	NSH	Low	12.7	11.8	5.7	Lg. dec.	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	37
red pine	Pinus resinosa	NSH	Medium	3.9	9.5	5.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	38
pin oak	Quercus palustris	NSH	Low	2.4	9.4	2.4	No change	No change	Low	Rare	Very Poor	Very Poor			2	39
mockernut hickory	Carya alba	WDL	Medium	18.1	7.6	3.1	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	40
sweetgum	Liquidambar styraciflua	WDH	High	1.5	7.1	1.5	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +		2	41
flowering dogwood	Cornus florida	WDL	Medium	14.2	6.4	1.2	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	42
Virginia pine	Pinus virginiana	NDH	High	3.3	4.9	1.5	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	43
bur oak	Quercus macrocarpa	NDH	Medium	2.7	4.9	2.0	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	44
northern catalpa	Catalpa speciosa	NSHX	FIA	0.5	4.0	4.2	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
scarlet oak	Quercus coccinea	WDL	Medium	0.7	3.9	5.4	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	46
blackgum	Nyssa sylvatica	WDL	Medium	0.3	3.7	0.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	47

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
ailanthus	Ailanthus altissima	NSL	FIA	4.2	3.6	2.0	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	48
yellow buckeye	Aesculus flava	NSL	Low	5.9	3.6	2.3	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	49
pawpaw	Asimina triloba	NSL	Low	2.3	3.2	0.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	50
rock elm	Ulmus thomasii	NSLX	FIA	4.4	2.9	1.5	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	51
bigtooth aspen	Populus grandidentata	NSL	Medium	2.3	2.4	1.1	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	52
red mulberry	Morus rubra	NSL	Low	3.8	2.4	0.8	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	53
Siberian elm	Ulmus pumila	NDH	FIA	0.7	1.8	2.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	54
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	6.5	1.7	0.6	No change	No change	Medium	Rare	Poor	Poor		Infill +	2	55
black ash	Fraxinus nigra	WSL	Medium	3.1	1.2	0.6	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	56
shingle oak	Quercus imbricaria	NDH	Medium	3.6	0.9	1.3	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	57
sugarberry	Celtis laevigata	NDH	Medium	0.1	0.7	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	58
northern pin oak	Quercus ellipsoidalis	NSH	Medium	2.2	0.4	1.6	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	59
shellbark hickory	Carya laciniosa	NSL	Low	2.9	0.1	0.7	No change	Lg. dec.	Medium	Rare	Poor	Very Poor			0	60
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	61
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	62
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	63
serviceberry	Amelanchier spp.	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	64
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	65
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate ++	3	66
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	67
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	68
pin cherry	Prunus pensylvanica	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	69
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	70
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	71
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	72
water oak	Quercus nigra	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	74
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	75
bluejack oak	Quercus incana	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	76
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	77
cedar elm	Ulmus crassifolia	NDH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	78