

	sq. km	sq. mi	FIA Plots
Area of Region	8,350.2	3,224.0	22

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	6	18	Increase	8	7	Very Good	0	0	Likely	3	2
Hickory	1			Medium	20	25	No Change	14	13	Good	6	6	Infill	15	15
Maple	3	Abundant	0	Low	23	6	Decrease	8	10	Fair	7	5	Migrate	7	11
Oak	6	Common	0	FIA	1		New	19	18	Poor	6	8		25	28
Pine	0	Rare	31				Unknown	1	2	Very Poor	10	9			
Other	18	Absent	19							FIA Only	0	0			
	31		50		50	49		50	50	Unknown	0	1			
											29	29			

Potential Changes in Climate Variables

Temperature (°F)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	50.1	52.0	54.5	54.6	
Average	CCSM85	50.1	52.7	55.4	58.2	
	GFDL45	50.1	56.6	55.6	56.6	
	GFDL85	50.1	53.2	56.6	60.9	
	HAD45	50.1	53.0	56.5	58.3	
	HAD85	50.1	53.3	58.0	62.9	
Growing Season	CCSM45	68.2	70.3	72.5	73.0	
	CCSM85	68.2	71.1	73.6	77.0	
May—Sep	GFDL45	68.2	76.2	74.7	76.2	
	GFDL85	68.2	72.0	75.9	81.1	
	HAD45	68.2	71.4	74.2	76.4	
	HAD85	68.2	71.3	76.8	81.6	
Coldest Month	CCSM45	21.0	22.3	24.8	24.8	
	CCSM85	21.0	23.6	25.3	27.0	
Average	GFDL45	21.0	25.1	26.2	26.7	
	GFDL85	21.0	24.8	26.2	27.7	
	HAD45	21.0	22.5	26.2	26.2	
	HAD85	21.0	24.9	28.1	30.8	
Warmest Month	CCSM45	74.1	76.3	77.8	78.5	
	CCSM85	74.1	77.8	79.6	81.2	
Average	GFDL45	74.1	77.3	78.9	80.1	
	GFDL85	74.1	78.3	80.1	83.2	
	HAD45	74.1	77.5	79.7	80.7	
	HAD85	74.1	78.6	82.1	85.2	

Precipitation (in)

Scenario	2009	2039	2069	2099		
Annual	CCSM45	37.4	36.8	36.2	36.3	
Total	CCSM85	37.4	36.9	36.1	37.3	
	GFDL45	37.4	39.9	43.8	44.5	
	GFDL85	37.4	40.7	46.2	46.5	
	HAD45	37.4	38.9	40.6	40.5	
	HAD85	37.4	40.7	38.3	41.7	
Growing Season	CCSM45	19.2	19.4	18.6	17.8	
	CCSM85	19.2	18.0	17.4	17.2	
May—Sep	GFDL45	19.2	19.9	21.6	22.0	
	GFDL85	19.2	20.8	22.3	21.6	
	HAD45	19.2	19.5	18.2	19.1	
	HAD85	19.2	19.6	16.4	16.9	

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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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
eastern cottonwood	Populus deltoides	NSH	Low	19.2	40.8	34.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	1
silver maple	Acer saccharinum	NSH	Low	28.7	40.0	22.2	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	2
green ash	Fraxinus pennsylvanica	WSH	Low	43.1	38.8	14.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	3
black cherry	Prunus serotina	WDL	Medium	38.3	23.0	9.6	No change	Sm. dec.	Low	Rare	Very Poor	Very Poor			2	4
bur oak	Quercus macrocarpa	NDH	Medium	24	21.0	14.0	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	5
white oak	Quercus alba	WDH	Medium	24	15.0	10.0	No change	Lg. dec.	High	Rare	Fair	Poor	Infill +	Infill +	2	6
eastern redcedar	Juniperus virginiana	WDH	Medium	4.8	15.0	50.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	7
black oak	Quercus velutina	WDH	High	19.2	11.4	9.5	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	8
swamp white oak	Quercus bicolor	NSL	Low	24	8.7	5.8	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			2	9
red mulberry	Morus rubra	NSL	Low	9.6	8.4	14.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	10
hackberry	Celtis occidentalis	WDH	Medium	14.4	8.1	9.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	11
boxelder	Acer negundo	WSH	Low	9.6	7.5	12.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	12
white ash	Fraxinus americana	WDL	Medium	19.2	6.8	5.7	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	13
black walnut	Juglans nigra	WDH	Low	19.2	6.1	5.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	14
American elm	Ulmus americana	WDH	Medium	19.2	5.6	4.7	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	15
black locust	Robinia pseudoacacia	NDH	Low	9.6	4.9	8.2	Sm. dec.	No change	Medium	Rare	Very Poor	Poor			2	16
northern red oak	Quercus rubra	WDH	Medium	9.6	4.8	8.1	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	17
black willow	Salix nigra	NSH	Low	9.6	4.3	7.2	No change	No change	Low	Rare	Very Poor	Very Poor			2	18
honeylocust	Gleditsia triacanthos	NSH	Low	9.6	4.0	6.7	Sm. inc.	Sm. inc.	High	Rare	Good	Good			2	19
pin oak	Quercus palustris	NSH	Low	4.8	3.3	11.1	No change	No change	Low	Rare	Very Poor	Very Poor			2	20
American basswood	Tilia americana	WSL	Medium	4.8	2.6	8.7	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	21
white mulberry	Morus alba	NSL	FIA	14.4	2.0	2.3	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	22
shagbark hickory	Carya ovata	WSL	Medium	4.8	1.5	5.0	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	23
balsam poplar	Populus balsamifera	NSH	Medium	4.8	1.4	4.6	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	24
sassafras	Sassafras albidum	WSL	Low	4.8	1.2	4.1	No change	Lg. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	25
bigtooth aspen	Populus grandidentata	NSL	Medium	4.8	1.2	4.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	26
serviceberry	Amelanchier spp.	NSL	Low	4.8	1.0	3.4	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
sycamore	Platanus occidentalis	NSL	Low	4.8	1.0	3.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	28
black maple	Acer nigrum	NSH	Low	4.8	0.7	2.4	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	29
blue ash	Fraxinus quadrangulata	NSL	Low	4.8	0.6	1.9	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	30
slippery elm	Ulmus rubra	WSL	Low	4.8	0.3	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	31
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	32
sugar maple	Acer saccharum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	33
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	34
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	Unknown	Medium	Absent	New Habitat	Unknown	Likely +		3	35
pecan	Carya illinoensis	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	36
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	37
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	38
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	39
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	41
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	42
Osage-orange	Maclura pomifera	NDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	43
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	44
shingle oak	Quercus imbricaria	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +		3	45
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	46
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	47

Midwin

National Forests and Grasslands 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
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	48
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	49
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	50