

	sq. km	sq. mi	FIA Plots
Area of Region	8,800.0	3,397.7	487

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	2			High	11	13	Increase	17	17	Very Good	6	6	Likely	1	1
Hickory	0			Medium	19	28	No Change	4	8	Good	11	13	Infill	4	3
Maple	5	Abundant	7	Low	17	8	Decrease	11	7	Fair	9	7	Migrate	4	10
Oak	4	Common	13	FIA	2		New	13	13	Poor	3	4		9	14
Pine	3	Rare	14				Unknown	4	4	Very Poor	1	0			
Other	20	Absent	15							FIA Only	2	2			
	34		49		49	49		49	49	Unknown	2	2			
											34	34			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	39.7	41.3	44.1	44.6	
	CCSM85	39.7	42.1	45.4	49.1	
	GFDL45	39.7	42.6	45.3	47.0	
	GFDL85	39.7	43.0	46.6	51.8	
	HAD45	39.7	42.8	46.5	48.5	
	HAD85	39.7	43.3	47.6	53.6	
Growing Season (May—Sep)	CCSM45	61.1	62.7	65.2	65.6	
	CCSM85	61.1	63.7	66.7	70.7	
	GFDL45	61.1	64.3	67.7	69.8	
	GFDL85	61.1	64.9	68.8	74.5	
	HAD45	61.1	64.2	67.2	69.5	
	HAD85	61.1	64.1	68.2	74.4	
Coldest Month Average	CCSM45	4.9	6.7	9.0	9.1	
	CCSM85	4.9	6.1	8.7	11.1	
	GFDL45	4.9	8.6	10.5	11.2	
	GFDL85	4.9	9.4	11.2	14.6	
	HAD45	4.9	6.8	11.0	10.8	
	HAD85	4.9	10.4	13.7	17.8	
Warmest Month Average	CCSM45	67.8	69.7	71.2	71.8	
	CCSM85	67.8	71.2	73.2	75.7	
	GFDL45	67.8	71.5	72.9	74.6	
	GFDL85	67.8	72.0	74.2	77.3	
	HAD45	67.8	71.1	72.6	74.5	
	HAD85	67.8	71.3	73.5	77.6	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	27.0	27.6	27.6	26.9	
	CCSM85	27.0	26.8	27.3	26.9	
	GFDL45	27.0	30.0	31.5	29.6	
	GFDL85	27.0	30.6	32.7	32.2	
	HAD45	27.0	28.5	26.6	28.4	
	HAD85	27.0	28.6	28.0	29.5	
Growing Season (May—Sep)	CCSM45	17.8	17.8	17.2	17.1	
	CCSM85	17.8	17.0	16.6	15.8	
	GFDL45	17.8	20.2	20.5	19.3	
	GFDL85	17.8	20.4	21.2	20.0	
	HAD45	17.8	18.1	16.1	16.8	
	HAD85	17.8	17.9	15.9	15.6	

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
quaking aspen	Populus tremuloides	WDH	High	94.3	2323.7	24.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	1
black ash	Fraxinus nigra	WSH	Medium	83	795.4	9.6	No change	No change	Low	Abundant	Fair	Fair			0	2
northern white-cedar	Thuja occidentalis	WSH	High	54.5	699.8	12.8	Sm. dec.	No change	Medium	Abundant	Fair	Good			1	3
balsam fir	Abies balsamea	NDH	High	85.2	694.3	8.2	Sm. dec.	No change	Low	Abundant	Fair	Fair			0	4
red pine	Pinus resinosa	NSH	Medium	46.6	690.8	14.8	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	5
paper birch	Betula papyrifera	WDH	High	93.2	658.5	7.1	No change	No change	Medium	Abundant	Good	Good			1	6
tamarack (native)	Larix laricina	NSH	High	55.7	631.2	11.3	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	7
black spruce	Picea mariana	NSH	High	53.4	450.3	8.4	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
American basswood	Tilia americana	WSL	Medium	55.7	433.2	7.8	Sm. inc.	No change	Medium	Common	Good	Fair			1	9
balsam poplar	Populus balsamifera	NSH	Medium	59.1	370.8	6.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	10
red maple	Acer rubrum	WDH	High	77.3	337.7	4.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	11
sugar maple	Acer saccharum	WDH	High	47.7	312.7	6.6	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
bur oak	Quercus macrocarpa	NDH	Medium	63.6	265.7	4.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	13
bigtooth aspen	Populus grandidentata	NSL	Medium	37.5	164.8	4.4	Sm. inc.	No change	Medium	Common	Good	Fair			1	14
northern red oak	Quercus rubra	WDH	Medium	36.4	157.3	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	15
eastern white pine	Pinus strobus	WDH	High	27.3	145.5	5.3	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
American elm	Ulmus americana	WDH	Medium	62.5	142.5	2.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
jack pine	Pinus banksiana	NSH	Medium	27.3	141.1	5.2	Sm. dec.	No change	High	Common	Fair	Good			1	18
green ash	Fraxinus pennsylvanica	WSH	Low	53.4	138.1	2.6	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
white spruce	Picea glauca	NSL	Medium	52.3	115.4	2.2	No change	Sm. inc.	Medium	Common	Fair	Good			1	20
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	27.3	41.8	1.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	21
boxelder	Acer negundo	WSH	Low	3.4	39.2	11.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	22
mountain maple	Acer spicatum	NSL	Low	36.4	34.9	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	23
northern pin oak	Quercus ellipsoidalis	NSH	Medium	10.2	25.4	2.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	24
yellow birch	Betula alleghaniensis	NDL	High	15.9	19.7	1.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	25
pin cherry	Prunus pensylvanica	NSL	Low	13.6	15.7	1.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	26
chokecherry	Prunus virginiana	NSLX	FIA	28.4	12.0	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	27
black cherry	Prunus serotina	WDL	Medium	9.1	7.3	0.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	28
silver maple	Acer saccharinum	NSH	Low	1.1	3.2	2.8	No change	Lg. inc.	High	Rare	Fair	Good	Infill +		2	29
eastern cottonwood	Populus deltoides	NSH	Low	1.1	3.0	2.6	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	30
serviceberry	Amelanchier spp.	NSL	Low	8	2.4	0.3	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	31
white oak	Quercus alba	WDH	Medium	2.3	2.2	1.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	32
American hornbeam; muscle	Carpinus caroliniana	WSL	Low	2.3	1.5	0.7	Very Lg. dec.	No change	Medium	Rare	Lost	Poor			0	33
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.1	0.9	0.8	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	35
bitternut hickory	Carya cordiformis	WDL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	36
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	37
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	38
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	39
white ash	Fraxinus americana	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	40
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	41
red mulberry	Morus rubra	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	42
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	43
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	44
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	45
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	46
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	47

Chippewa

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
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 48
slippery elm	<i>Ulmus rubra</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 49