

	sq. km	sq. mi	FIA Plots
Area of Region	46,544	17,971	38

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	1			High	8	10	Increase	4	3	Very Good	0	0
Hickory	0			Medium	12	21	No Change	2	4	Good	3	4
Maple	1	Abundant	0	Low	13	4	Decrease	8	7	Fair	2	0
Oak	1	Common	2	FIA	4		New	15	15	Poor	4	5
Pine	1	Rare	16				Unknown	8	8	Very Poor	5	3
Other	14	Absent	19							FIA Only	2	2
	18		37		37	35		37	37	Unknown	4	4
											20	18

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	40.1	41.8	44.3	45.1	
	CCSM85	40.1	42.4	45.9	49.5	
	GFDL45	40.1	46.4	44.8	46.4	
	GFDL85	40.1	42.8	46.3	51.2	
	HAD45	40.1	43.6	47.4	49.4	
	HAD85	40.1	44.0	49.0	54.6	
Growing Season (May—Sep)	CCSM45	62.2	64.3	66.7	67.4	
	CCSM85	62.2	65.1	68.2	72.2	
	GFDL45	62.2	70.0	68.1	70.0	
	GFDL85	62.2	65.6	69.3	75.0	
	HAD45	62.2	65.4	68.3	70.6	
	HAD85	62.2	65.3	69.4	75.1	
Coldest Month (Average)	CCSM45	5.0	6.5	8.8	8.9	
	CCSM85	5.0	6.0	8.4	10.9	
	GFDL45	5.0	8.3	9.4	10.0	
	GFDL85	5.0	8.8	10.5	13.4	
	HAD45	5.0	8.1	11.9	11.7	
	HAD85	5.0	10.8	15.5	18.5	
Warmest Month (Average)	CCSM45	69.2	72.1	73.5	74.0	
	CCSM85	69.2	72.8	75.0	77.4	
	GFDL45	69.2	73.0	74.5	75.8	
	GFDL85	69.2	73.1	75.2	78.7	
	HAD45	69.2	73.1	74.5	76.4	
	HAD85	69.2	72.7	75.3	78.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	19.5	18.9	19.5	18.7	
	CCSM85	19.5	19.1	19.3	19.2	
	GFDL45	19.5	21.7	23.9	22.7	
	GFDL85	19.5	22.6	24.6	24.1	
	HAD45	19.5	20.1	19.1	19.7	
	HAD85	19.5	19.9	19.6	21.4	
Growing Season (May—Sep)	CCSM45	13.7	12.7	13.2	12.4	
	CCSM85	13.7	12.8	12.9	12.2	
	GFDL45	13.7	15.4	16.9	15.5	
	GFDL85	13.7	15.5	16.8	15.8	
	HAD45	13.7	13.4	12.3	12.1	
	HAD85	13.7	13.0	11.9	11.6	

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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Section 332A

EcoMap 2007
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
quaking aspen	Populus tremuloides	WDH	High	2.8	73.0	31.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	2	1
bur oak	Quercus macrocarpa	NDH	Medium	10.5	70.5	28.6	Sm. dec.	No change	High	Common	Fair	Good	Infill +		2	2
green ash	Fraxinus pennsylvanica	WSH	Low	13.9	38.6	19.3	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	3
boxelder	Acer negundo	WSH	Low	10.8	31.7	21.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor	Infill +	Infill +	2	4
balsam poplar	Populus balsamifera	NSH	Medium	1.1	11.4	6.7	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	5
eastern cottonwood	Populus deltoides	NSH	Low	1.7	8.9	37.3	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	6
American elm	Ulmus americana	WDH	Medium	5.3	6.5	12.2	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	7
Siberian elm	Ulmus pumila	NDH	FIA	2.4	2.8	16.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	8
American basswood	Tilia americana	WSL	Medium	1.7	2.5	8.3	Sm. inc.	No change	Medium	Rare	Fair	Poor	Infill +	Infill +	2	9
Scots pine	Pinus sylvestris	NSH	FIA	0.9	1.9	34.5	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	10
chokecherry	Prunus virginiana	NSLX	FIA	2.7	1.8	2.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	11
white spruce	Picea glauca	NSL	Medium	0.3	1.0	6.4	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	12
eastern redcedar	Juniperus virginiana	WDH	Medium	1.5	0.7	5.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	13
wild plum	Prunus americana	NSLX	FIA	0.9	0.7	13.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	14
pin cherry	Prunus pensylvanica	NSL	Low	0.9	0.3	0.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	15
serviceberry	Amelanchier spp.	NSL	Low	1.8	0.3	0.6	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	16
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	1	0.2	0.8	Lg. inc.	Sm. inc.	High	Rare	Good	Good			2	17
paper birch	Betula papyrifera	WDH	High	0.5	0.0	0.5	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	18
balsam fir	Abies balsamea	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	19
ashe juniper	Juniperus ashei	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	20
striped maple	Acer pensylvanicum	NSL	Medium	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	21
red maple	Acer rubrum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	22
sugar maple	Acer saccharum	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	23
mountain maple	Acer spicatum	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	24
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	25
yellow birch	Betula alleghaniensis	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	26
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	27
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	28
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	29
black ash	Fraxinus nigra	WSH	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	30
honeylocust	Gleditsia triacanthos	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	31
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	32
black cherry	Prunus serotina	WDL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat		Migrate +	3	33
northern red oak	Quercus rubra	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	34
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	35
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	36
slippery elm	Ulmus rubra	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	37

