

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	46,109	17,803	1,504

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	22	20	Increase	15	19	Very Good	5	4	Likely	0	0
Hickory	2			Medium	24	40	No Change	13	7	Good	12	13	Infill	9	12
Maple	6	Abundant	8	Low	25	13	Decrease	20	22	Fair	14	16	Migrate	6	8
Oak	7	Common	21	FIA	5		New	19	20	Poor	8	9			
Pine	4	Rare	24				Unknown	9	8	Very Poor	9	5			
Other	31	Absent	22							FIA Only	2	2			
	<b>53</b>		<b>75</b>		<b>76</b>	<b>73</b>		<b>76</b>	<b>76</b>	Unknown	4	3			
											<b>54</b>	<b>52</b>			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.6	46.4	49.5	49.3	
	CCSM85	44.6	47.1	50.2	53.6	
	GFDL45	44.6	47.5	50.5	51.8	
	GFDL85	44.6	47.9	51.7	56.5	
	HAD45	44.6	48.0	51.2	53.1	
HAD85	44.6	48.2	52.5	58.3		
Growing Season (May—Sep)	CCSM45	62.3	63.9	66.3	66.5	
	CCSM85	62.3	64.4	67.2	71.0	
	GFDL45	62.3	66.1	69.9	71.8	
	GFDL85	62.3	66.8	71.4	76.9	
	HAD45	62.3	65.8	68.0	70.6	
HAD85	62.3	65.4	69.8	75.7		
Coldest Month (Average)	CCSM45	17.9	19.7	22.7	22.2	
	CCSM85	17.9	20.8	23.2	25.5	
	GFDL45	17.9	19.8	21.7	22.9	
	GFDL85	17.9	20.8	22.4	24.9	
	HAD45	17.9	19.7	23.5	23.7	
HAD85	17.9	21.9	24.6	29.0		
Warmest Month (Average)	CCSM45	68.4	70.5	71.9	72.3	
	CCSM85	68.4	71.4	73.1	75.1	
	GFDL45	68.4	72.4	74.1	75.4	
	GFDL85	68.4	73.1	75.4	78.3	
	HAD45	68.4	72.3	73.4	75.2	
HAD85	68.4	72.6	75.1	79.3		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	32.3	32.1	31.4	32.6	
	CCSM85	32.3	33.0	32.1	33.2	
	GFDL45	32.3	34.4	37.1	36.5	
	GFDL85	32.3	35.2	37.9	38.6	
	HAD45	32.3	33.6	35.0	34.7	
HAD85	32.3	34.9	34.2	37.2		
Growing Season (May—Sep)	CCSM45	16.2	16.7	15.7	16.3	
	CCSM85	16.2	16.7	15.7	15.4	
	GFDL45	16.2	16.6	18.1	17.8	
	GFDL85	16.2	17.7	17.4	17.3	
	HAD45	16.2	16.1	15.1	15.5	
HAD85	16.2	16.5	13.9	14.9		

**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-DGP30 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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EcoMap 2007  
Climate Change Atlas Tree Species

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

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Common Name	Scientific Name	Range	MR	%Cell	FIAsum	FIAiv	ChngCl45	ChngCl85	Adap	Abund	Capabil45	Capabil85	SHIFT45	SHIFT85	SSO	N
red maple	Acer rubrum	WDH	High	74.7	1103.4	13.3	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
red pine	Pinus resinosa	NSH	Medium	44.1	917.5	19.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
sugar maple	Acer saccharum	WDH	High	39.6	840.1	18.4	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	3
quaking aspen	Populus tremuloides	WDH	High	57.4	731.7	11.6	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	4
bigtooth aspen	Populus grandidentata	NSL	Medium	53.6	662.9	11.5	Sm. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	5
northern red oak	Quercus rubra	WDH	Medium	47.9	557.7	10.5	No change	No change	High	Abundant	Very Good	Very Good			1	6
northern white-cedar	Thuja occidentalis	WSH	High	29.8	517.8	14.5	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
eastern white pine	Pinus strobus	WDH	High	49.4	514.2	9.1	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	8
jack pine	Pinus banksiana	NSH	Medium	29.9	487.7	15.9	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	9
white oak	Quercus alba	WDH	Medium	31.8	333.2	9.3	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	10
green ash	Fraxinus pennsylvanica	WSH	Low	26.5	312.8	9.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	11
black cherry	Prunus serotina	WDL	Medium	50.3	283.1	5.1	Lg. inc.	Sm. inc.	Low	Common	Good	Fair			1	12
northern pin oak	Quercus ellipsoidalis	NSH	Medium	26.5	262.2	9.0	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	13
balsam fir	Abies balsamea	NDH	High	31.5	242.9	6.9	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	14
white ash	Fraxinus americana	WDL	Medium	28.2	178.0	5.2	No change	Sm. inc.	Low	Common	Poor	Fair			1	15
paper birch	Betula papyrifera	WDH	High	41.4	173.1	3.6	No change	No change	Medium	Common	Fair	Fair			1	16
black oak	Quercus velutina	WDH	High	22.6	169.3	6.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
American basswood	Tilia americana	WSL	Medium	26.4	166.9	6.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	18
Scots pine	Pinus sylvestris	NSH	FIA	7.5	160.6	15.0	Unknown	Unknown	NA	Common	NNIS	NNIS			0	19
American beech	Fagus grandifolia	WDH	High	29.2	159.2	4.6	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	20
black ash	Fraxinus nigra	WSH	Medium	27.6	129.0	4.2	No change	Sm. dec.	Low	Common	Poor	Poor			0	21
American elm	Ulmus americana	WDH	Medium	27.7	93.3	2.9	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	22
silver maple	Acer saccharinum	NSH	Low	8.3	91.8	9.5	No change	No change	High	Common	Good	Good	Infill ++	Infill ++	1	23
white spruce	Picea glauca	NSL	Medium	13.1	88.2	5.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	24
eastern hemlock	Tsuga canadensis	NSH	High	16.8	86.2	4.2	No change	Sm. dec.	Low	Common	Poor	Poor	Infill +	Infill +	0	25
tamarack (native)	Larix laricina	NSH	High	11.1	85.2	7.2	No change	No change	Low	Common	Poor	Poor			0	26
balsam poplar	Populus balsamifera	NSH	Medium	14.1	67.4	4.4	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	27
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	23.2	64.6	2.5	Lg. dec.	Lg. dec.	High	Common	Fair	Fair			1	28
black spruce	Picea mariana	NSH	High	13	54.7	3.8	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor		Infill +	0	29
serviceberry	Amelanchier spp.	NSL	Low	15.4	25.7	1.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	30
yellow birch	Betula alleghaniensis	NDL	High	11.1	22.8	2.0	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	1	31
Norway spruce	Picea abies	NSH	FIA	1.8	18.9	6.4	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	32
swamp white oak	Quercus bicolor	NSL	Low	3.2	16.8	4.7	Sm. inc.	Sm. inc.	Medium	Rare	Fair	Fair	Infill +	Infill +	2	33
pin cherry	Prunus pensylvanica	NSL	Low	4.3	15.7	3.4	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	34
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	8.3	15.0	1.8	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	35
bur oak	Quercus macrocarpa	NDH	Medium	3.5	14.7	3.8	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	36
black locust	Robinia pseudoacacia	NDH	Low	0.4	10.0	23.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	37
sassafras	Sassafras albidum	WSL	Low	4.8	9.9	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
eastern cottonwood	Populus deltoides	NSH	Low	1.7	9.5	3.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	39
black willow	Salix nigra	NSH	Low	1.2	6.6	2.7	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	40
boxelder	Acer negundo	WSH	Low	0.8	5.5	4.8	No change	Sm. inc.	High	Rare	Fair	Good	Infill +		2	41
blackgum	Nyssa sylvatica	WDL	Medium	0.6	5.0	3.8	Sm. inc.	Lg. inc.	High	Rare	Good	Good			2	42
slippery elm	Ulmus rubra	WSL	Low	2.3	4.8	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			2	43
bitternut hickory	Carya cordiformis	WSL	Low	1.7	4.6	2.6	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	2	44
peachleaf willow	Salix amygdaloides	NSLX	FIA	1.2	3.6	2.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	45
mountain maple	Acer spicatum	NSL	Low	0.4	3.6	4.3	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			0	46
chokecherry	Prunus virginiana	NSLX	FIA	2.7	3.1	1.0	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	47



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pin oak	Quercus palustris	NSH	Low	0.4	1.8	4.1	No change	Lg. inc.	Low	Rare	Very Poor	Fair		Infill +	2	48	
Siberian elm	Ulmus pumila	NDH	FIA	0.3	1.5	2.8	Unknown	Unknown	NA	Rare	NNIS	NNIS				0	49
flowering dogwood	Cornus florida	WDL	Medium	0.6	0.8	1.1	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		Infill +	2	50	
shagbark hickory	Carya ovata	WSL	Medium	0.1	0.6	0.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	51
eastern redcedar	Juniperus virginiana	WDH	Medium	0.4	0.4	0.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2	52
striped maple	Acer pensylvanicum	NSL	Medium	0.5	0.4	0.4	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor				0	53
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	54
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	55
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				3	56
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	57
shellbark hickory	Carya laciniosa	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0	58
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	59
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	60
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	61
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	62
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	63
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++		3	64
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	65
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	66
cucumber tree	Magnolia acuminata	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown				0	67
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0	68
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				0	69
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3	70
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	71
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0	72
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	73
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	74
live oak	Quercus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	75
American mountain-ash	Sorbus americana	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0	76

