

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	10,465	4,040.4	257

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	23	22	Increase	15	17	Very Good	5	5	Likely	4	4
Hickory	4			Medium	24	41	No Change	12	8	Good	13	12	Infill	8	8
Maple	5	Abundant	9	Low	29	15	Decrease	19	21	Fair	11	13	Migrate	5	10
Oak	4	Common	21	FIA	4		New	21	23	Poor	7	6			
Pine	4	Rare	20				Unknown	13	11	Very Poor	9	7			
Other	30	Absent	29							FIA Only	2	2			
	<b>50</b>		<b>79</b>		<b>80</b>	<b>78</b>		<b>80</b>	<b>80</b>	Unknown	9	7			
											<b>56</b>	<b>52</b>			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.5	46.5	49.0	49.0	
	CCSM85	44.5	47.0	49.6	52.9	
	GFDL45	44.5	47.7	51.1	52.4	
	GFDL85	44.5	48.2	52.4	57.3	
	HAD45	44.5	47.7	51.0	52.8	
HAD85	44.5	47.8	52.0	57.7		
Growing Season (May—Sep)	CCSM45	62.3	64.4	66.3	66.7	
	CCSM85	62.3	64.6	67.1	71.0	
	GFDL45	62.3	65.7	69.7	71.3	
	GFDL85	62.3	66.6	71.3	76.5	
	HAD45	62.3	65.5	68.3	70.7	
HAD85	62.3	65.2	69.8	76.1		
Coldest Month Average	CCSM45	16.4	18.3	20.7	20.8	
	CCSM85	16.4	19.4	20.8	23.1	
	GFDL45	16.4	19.7	21.9	22.9	
	GFDL85	16.4	20.7	22.7	25.5	
	HAD45	16.4	18.7	22.0	22.3	
HAD85	16.4	20.0	22.7	26.3		
Warmest Month Average	CCSM45	68.3	70.5	71.8	71.9	
	CCSM85	68.3	71.1	72.8	75.0	
	GFDL45	68.3	71.4	73.7	74.9	
	GFDL85	68.3	72.6	75.4	78.3	
	HAD45	68.3	71.8	73.3	75.0	
HAD85	68.3	71.8	74.6	79.2		

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	47.7	47.0	45.6	50.0	
	CCSM85	47.7	48.4	48.9	50.0	
	GFDL45	47.7	52.2	53.9	52.8	
	GFDL85	47.7	49.5	52.8	54.8	
	HAD45	47.7	49.7	51.5	50.8	
HAD85	47.7	50.8	50.1	54.3		
Growing Season (May—Sep)	CCSM45	20.9	20.7	19.1	21.1	
	CCSM85	20.9	20.7	20.8	19.4	
	GFDL45	20.9	21.8	20.8	20.7	
	GFDL85	20.9	20.8	20.5	19.6	
	HAD45	20.9	21.5	20.2	21.0	
HAD85	20.9	20.9	19.8	21.0		

**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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EcoMap 2007  
Climate Change Atlas Tree Species

USDA Forest Service  
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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	78.3	1909.2	15.0	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	78.1	1559.9	11.8	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
eastern hemlock	Tsuga canadensis	NSH	High	58.9	1024.2	10.3	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	3
white ash	Fraxinus americana	WDL	Medium	71.5	905.1	8.0	No change	No change	Low	Abundant	Fair	Fair			0	4
black cherry	Prunus serotina	WDL	Medium	68.9	746.0	6.6	Sm. inc.	No change	Low	Abundant	Good	Fair			1	5
eastern white pine	Pinus strobus	WDH	High	45.8	745.9	8.4	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	6
American beech	Fagus grandifolia	WDH	High	61.3	580.6	5.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
quaking aspen	Populus tremuloides	WDH	High	42.6	533.6	8.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	8
yellow birch	Betula alleghaniensis	NDL	High	57.1	530.5	6.0	Lg. dec.	Lg. dec.	Medium	Abundant	Fair	Fair			0	9
American elm	Ulmus americana	WDH	Medium	54.2	451.3	5.7	No change	No change	Medium	Common	Fair	Fair			1	10
balsam fir	Abies balsamea	NDH	High	24	331.3	9.1	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	11
red pine	Pinus resinosa	NSH	Medium	10.1	255.8	11.3	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	12
American basswood	Tilia americana	WSL	Medium	31.7	197.8	4.0	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
northern red oak	Quercus rubra	WDH	Medium	18.1	194.2	4.4	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	14
boxelder	Acer negundo	WSH	Low	4.5	158.0	15.6	No change	No change	High	Common	Good	Good			1	15
red spruce	Picea rubens	NDH	High	27.6	150.9	3.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	16
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	28.9	125.4	2.4	No change	Sm. inc.	High	Common	Good	Very Good			1	17
green ash	Fraxinus pennsylvanica	WSH	Low	10.8	122.6	6.3	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	18
eastern cottonwood	Populus deltoides	NSH	Low	5.6	110.8	15.1	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	19
Norway spruce	Picea abies	NSH	FIA	7	98.1	8.3	Unknown	Unknown	NA	Common	NNIS	NNIS			0	20
Scots pine	Pinus sylvestris	NSH	FIA	8.7	97.3	5.8	Unknown	Unknown	NA	Common	NNIS	NNIS			0	21
black willow	Salix nigra	NSH	Low	6.6	94.1	9.5	Sm. dec.	Sm. dec.	Low	Common	Poor	Poor			0	22
bitternut hickory	Carya cordiformis	WSL	Low	13.8	94.0	4.8	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	23
shagbark hickory	Carya ovata	WSL	Medium	4.5	71.3	6.0	No change	No change	Medium	Common	Fair	Fair	Infill +	Infill +	1	24
tamarack (native)	Larix laricina	NSH	High	10.5	69.2	6.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	25
gray birch	Betula populifolia	NSL	Low	12.2	66.4	2.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	26
northern white-cedar	Thuja occidentalis	WSH	High	3.4	59.3	7.0	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	27
black ash	Fraxinus nigra	WSH	Medium	15.9	56.6	2.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	28
bigtooth aspen	Populus grandidentata	NSL	Medium	13.3	56.4	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	29
serviceberry	Amelanchier spp.	NSL	Low	23.6	55.9	1.6	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	30
silver maple	Acer saccharinum	NSH	Low	2.6	49.9	14.7	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	31
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	13.5	35.0	1.4	Sm. dec.	Sm. inc.	Medium	Rare	Very Poor	Fair			1	32
white spruce	Picea glauca	NSL	Medium	4.8	28.9	6.0	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	33
paper birch	Betula papyrifera	WDH	High	9.1	26.4	1.8	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	1	34
black oak	Quercus velutina	WDH	High	1.5	17.3	3.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	35
striped maple	Acer pensylvanicum	NSL	Medium	12.9	15.9	0.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
black locust	Robinia pseudoacacia	NDH	Low	1	15.7	4.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	37
pignut hickory	Carya glabra	WDL	Medium	3.5	14.6	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	2	38
swamp white oak	Quercus bicolor	NSL	Low	1	14.0	0.8	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	2	39
sweet birch	Betula lenta	NDH	High	4.9	13.8	2.4	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	40
white oak	Quercus alba	WDH	Medium	1.2	13.3	0.8	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	41
pin cherry	Prunus pensylvanica	NSL	Low	5.9	9.4	1.3	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	42
butternut	Juglans cinerea	NSLX	FIA	1.8	6.7	3.2	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	43
sycamore	Platanus occidentalis	NSL	Low	1.6	5.2	2.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	44
black walnut	Juglans nigra	WDH	Low	0.6	3.0	1.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	45
hackberry	Celtis occidentalis	WDH	Medium	1	2.6	2.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	46
pitch pine	Pinus rigida	NSH	High	0.5	1.6	0.9	No change	Sm. dec.	Medium	Rare	Poor	Very Poor			1	47



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mockernut hickory	<i>Carya alba</i>	WDL	Medium	1	1.3	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	48
chokecherry	<i>Prunus virginiana</i>	NSLX	FIA	1.7	1.0	0.5	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	49
black spruce	<i>Picea mariana</i>	NSH	High	1	0.7	0.7	Very Lg. dec.	Very Lg. dec.	Medium	Rare	Lost	Lost			0	50
eastern redcedar	<i>Juniperus virginiana</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	51
jack pine	<i>Pinus banksiana</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +		3	52
shortleaf pine	<i>Pinus echinata</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	53
mountain maple	<i>Acer spicatum</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	54
cittamwood/gum bumelia	<i>Sideroxylon lanuginosum ssp.</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	55
black hickory	<i>Carya texana</i>	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	56
sugarberry	<i>Celtis laevigata</i>	NDH	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	57
eastern redbud	<i>Cercis canadensis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	58
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	59
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	60
honeylocust	<i>Gleditsia triacanthos</i>	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	61
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	62
sweetgum	<i>Liquidambar styraciflua</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	63
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	64
cucumbertree	<i>Magnolia acuminata</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Modeled	Unknown	Unknown			0	65
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	66
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	67
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	68
sourwood	<i>Oxydendron arboreum</i>	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	69
redbay	<i>Persea borbonia</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	70
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	71
northern pin oak	<i>Quercus ellipsoidalis</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	72
chinkapin oak	<i>Quercus muehlenbergii</i>	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	73
pin oak	<i>Quercus palustris</i>	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	74
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	75
post oak	<i>Quercus stellata</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	76
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	77
American mountain-ash	<i>Sorbus americana</i>	NSL	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown			0	78
winged elm	<i>Ulmus alata</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	79
slippery elm	<i>Ulmus rubra</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	80

