

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	9,441.0	3,645.2	283

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				Increase	23	24	Very Good	7	7	Likely	3	3		
Hickory	4				No Change	8	7	Good	14	18	Infill	10	9		
Maple	6	Abundant	8	High	24	23	Decrease	22	22	Fair	10	8	Migrate	6	14
Oak	8	Common	20	Medium	26	45	New	22	26	Poor	10	8		19	26
Pine	3	Rare	32	Low	33	17	Unknown	15	11	Very Poor	11	9			
Other	36	Absent	30	FIA	7					FIA Only	2	2			
	<b>60</b>		<b>90</b>		<b>90</b>	<b>85</b>		<b>90</b>	<b>90</b>		<b>62</b>	<b>56</b>			

Potential Changes in Climate Variables

Temperature (°F)					
	Scenario	2009	2039	2069	2099
Annual Average	CCSM45	44.6	46.5	48.8	49.1
	CCSM85	44.6	47.0	49.5	52.8
	GFDL45	44.6	47.5	50.8	52.1
	GFDL85	44.6	48.1	52.1	56.7
	HAD45	44.6	47.6	50.9	52.6
HAD85	44.6	47.7	51.9	57.3	
Growing Season May—Sep	CCSM45	61.3	63.4	65.2	65.8
	CCSM85	61.3	63.6	66.1	70.0
	GFDL45	61.3	64.3	68.4	69.9
	GFDL85	61.3	65.4	69.9	74.7
	HAD45	61.3	64.5	67.3	69.6
HAD85	61.3	64.0	68.7	74.8	
Coldest Month Average	CCSM45	18.7	20.6	22.6	23.0
	CCSM85	18.7	21.5	22.7	24.9
	GFDL45	18.7	21.8	23.7	24.5
	GFDL85	18.7	22.4	24.2	26.5
	HAD45	18.7	20.8	23.8	23.9
HAD85	18.7	22.0	24.4	27.7	
Warmest Month Average	CCSM45	67.0	69.7	70.8	71.0
	CCSM85	67.0	69.9	71.6	73.7
	GFDL45	67.0	70.0	72.2	73.5
	GFDL85	67.0	71.4	74.1	76.9
	HAD45	67.0	70.5	72.1	73.6
HAD85	67.0	70.4	73.1	77.5	

Precipitation (in)					
	Scenario	2009	2039	2069	2099
Annual Total	CCSM45	45.7	45.9	44.9	49.2
	CCSM85	45.7	46.4	48.4	50.5
	GFDL45	45.7	50.4	52.4	51.2
	GFDL85	45.7	47.9	51.5	54.0
	HAD45	45.7	47.7	49.0	48.1
HAD85	45.7	48.6	48.5	51.3	
Growing Season May—Sep	CCSM45	21.1	22.0	21.0	22.7
	CCSM85	21.1	21.4	22.7	21.8
	GFDL45	21.1	21.7	21.1	21.7
	GFDL85	21.1	21.0	21.1	21.1
	HAD45	21.1	22.4	20.9	21.3
HAD85	21.1	21.2	21.0	22.0	

**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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Section 2111

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	93	2117.6	16.1	No change	Sm. dec.	High	Abundant	Very Good	Good			1	1
sugar maple	Acer saccharum	WDH	High	93.3	2040.4	16.6	Sm. dec.	Sm. dec.	High	Abundant	Good	Good			1	2
American beech	Fagus grandifolia	WDH	High	79	1052.8	9.4	Lg. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	3
eastern hemlock	Tsuga canadensis	NSH	High	62.2	912.8	9.9	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
white ash	Fraxinus americana	WDL	Medium	87.6	879.4	7.1	No change	No change	Low	Abundant	Fair	Fair			0	5
eastern white pine	Pinus strobus	WDH	High	46.9	646.8	8.7	No change	No change	Low	Abundant	Fair	Fair			0	6
black cherry	Prunus serotina	WDL	Medium	65.9	589.8	6.8	Sm. inc.	No change	Low	Abundant	Good	Fair			1	7
northern red oak	Quercus rubra	WDH	Medium	57.2	521.2	6.6	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	8
yellow birch	Betula alleghaniensis	NDL	High	56.4	371.3	5.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	9
sweet birch	Betula lenta	NDH	High	54.2	285.2	3.5	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	10
quaking aspen	Populus tremuloides	WDH	High	27.5	241.4	7.1	Sm. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	11
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	58.3	224.6	2.5	Sm. dec.	Sm. dec.	High	Common	Fair	Fair			1	12
American basswood	Tilia americana	WSL	Medium	35.3	151.8	2.8	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	13
American elm	Ulmus americana	WDH	Medium	20.1	112.9	3.9	Sm. inc.	Lg. inc.	Medium	Common	Good	Very Good			1	14
chestnut oak	Quercus prinus	NDH	High	9.5	112.4	6.7	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	15
striped maple	Acer pensylvanicum	NSL	Medium	38.1	95.4	2.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	16
serviceberry	Amelanchier spp.	NSL	Low	32.8	90.9	2.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	17
paper birch	Betula papyrifera	WDH	High	24.9	85.5	3.2	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
shagbark hickory	Carya ovata	WSL	Medium	12	72.2	3.2	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	19
balsam fir	Abies balsamea	NDH	High	6.4	68.4	10.8	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	20
red pine	Pinus resinosa	NSH	Medium	6	63.9	9.6	Lg. dec.	Very Lg. dec.	Low	Common	Very Poor	Lost			0	21
Norway spruce	Picea abies	NSH	FIA	7.4	60.9	4.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	22
bigtooth aspen	Populus grandidentata	NSL	Medium	12.2	58.4	2.5	Lg. inc.	Sm. inc.	Medium	Common	Very Good	Good			1	23
pignut hickory	Carya glabra	WDL	Medium	9	58.0	3.9	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	24
white oak	Quercus alba	WDH	Medium	8.4	54.7	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	25
Scots pine	Pinus sylvestris	NSH	FIA	6.6	52.8	7.1	Unknown	Unknown	NA	Common	NNIS	NNIS			0	26
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	24.6	52.2	1.5	Sm. dec.	Sm. inc.	Medium	Common	Poor	Good			1	27
black oak	Quercus velutina	WDH	High	4.2	51.9	4.4	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good	Infill ++	Infill ++	1	28
eastern cottonwood	Populus deltoides	NSH	Low	0.3	47.6	3.0	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	29
black locust	Robinia pseudoacacia	NDH	Low	3.4	45.1	8.8	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	30
red spruce	Picea rubens	NDH	High	8.7	44.4	4.5	Sm. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	31
bitternut hickory	Carya cordiformis	WSL	Low	7.5	43.5	4.3	No change	No change	High	Rare	Fair	Fair	Infill +	Infill +	1	32
eastern redcedar	Juniperus virginiana	WDH	Medium	6.5	39.0	1.2	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	33
pin oak	Quercus palustris	NSH	Low	0.6	33.5	1.9	No change	No change	Low	Rare	Very Poor	Very Poor			2	34
black willow	Salix nigra	NSH	Low	3.2	28.8	9.0	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	35
pin cherry	Prunus pensylvanica	NSL	Low	6.8	20.8	2.7	Sm. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	36
white spruce	Picea glauca	NSL	Medium	1.7	19.8	2.5	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	37
swamp white oak	Quercus bicolor	NSL	Low	0.2	14.5	2.4	No change	No change	Medium	Rare	Poor	Poor	Infill +	Infill +	2	38
green ash	Fraxinus pennsylvanica	WSH	Low	2	13.6	2.7	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	1	39
river birch	Betula nigra	NSL	Low	0.5	11.4	5.1	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	40
tamarack (native)	Larix laricina	NSH	High	1.8	10.8	4.8	Lg. dec.	Very Lg. dec.	Low	Rare	Very Poor	Lost			0	41
gray birch	Betula populifolia	NSL	Low	4.4	9.1	1.5	Sm. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	42
American mountain-ash	Sorbus americana	NSL	Low	3.2	8.0	2.5	Sm. dec.	Sm. dec.	Low	Rare	Very Poor	Very Poor			0	43
ailanthus	Ailanthus altissima	NSL	FIA	0.1	7.6	0.9	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	44
mockernut hickory	Carya alba	WDL	Medium	0.9	5.6	0.3	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	45
butternut	Juglans cinerea	NSLX	FIA	4.7	5.2	0.9	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	46
boxelder	Acer negundo	WSH	Low	1.3	4.7	2.0	Sm. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	2	47



Section 211I

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black ash	Fraxinus nigra	WSH	Medium	2.1	4.1	1.9	Very Lg. dec.	Very Lg. dec.	Low	Rare	Lost	Lost				0 48
sycamore	Platanus occidentalis	NSL	Low	0.7	3.8	2.2	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 49
slippery elm	Ulmus rubra	WSL	Low	2.1	1.9	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +			2 50
scarlet oak	Quercus coccinea	WDL	Medium	0.9	1.7	1.4	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 51
blackgum	Nyssa sylvatica	WDL	Medium	0.4	1.6	0.6	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 52
chinkapin oak	Quercus muehlenbergii	NSL	Medium	0.1	1.6	0.2	No change	Lg. inc.	Medium	Rare	Poor	Good				2 53
sassafras	Sassafras albidum	WSL	Low	0.1	1.3	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 54
white mulberry	Morus alba	NSL	FIA	0.1	1.2	0.1	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 55
chokecherry	Prunus virginiana	NSL	FIA	0.1	1.1	0.1	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only				0 56
yellow-poplar	Liriodendron tulipifera	WDH	High	0.7	0.9	0.5	Lg. inc.	Lg. inc.	High	Rare	Good	Good				2 57
mountain maple	Acer spicatum	NSL	Low	1.1	0.7	0.7	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor				0 58
Norway maple	Acer platanoides	NSL	FIA	0.2	0.6	0.1	Unknown	Unknown	NA	Rare	NNIS	NNIS				0 59
black walnut	Juglans nigra	WDH	Low	0.2	0.6	0.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good				2 60
shortleaf pine	Pinus echinata	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 61
Table Mountain pine	Pinus pungens	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 62
pitch pine	Pinus rigida	NSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +			3 63
loblolly pine	Pinus taeda	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++		3 64
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 65
northern white-cedar	Thuja occidentalis	WSH	High	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 66
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0 67
silver maple	Acer saccharinum	NSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 68
pawpaw	Asimina triloba	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 69
cittawood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0 70
pecan	Carya illinoensis	NSH	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				0 71
black hickory	Carya texana	NDL	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 72
sugarberry	Celtis laevigata	NDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0 73
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +		3 74
eastern redbud	Cercis canadensis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 75
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +		3 76
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 77
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3 78
cucumbertree	Magnolia acuminata	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +		3 79
southern magnolia	Magnolia grandiflora	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 80
bigleaf magnolia	Magnolia macrophylla	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				0 81
mountain or Fraser magnolia	Magnolia fraseri	NSL	Low	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				0 82
sourwood	Oxydendrum arboreum	NDL	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 83
southern red oak	Quercus falcata	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 84
cherrybark oak; swamp red o.	Quercus pagoda	NSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 85
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	Unknown	New Habitat	Low	Absent	Unknown	New Habitat				3 86
blackjack oak	Quercus marilandica	NSL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3 87
Shumard oak	Quercus shumardii	NSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				0 88
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3 89
winged elm	Ulmus alata	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3 90

