

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	42,850	16,545	1,742

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	19	Increase	16	20	Very Good	6	5	Likely	4	4
Hickory	0			Medium	22	37	No Change	9	6	Good	6	12	Infill	6	8
Maple	5	Abundant	8	Low	27	16	Decrease	11	10	Fair	12	10	Migrate	6	12
Oak	1	Common	10	FIA	1		New	23	27	Poor	8	7		16	24
Pine	3	Rare	19				Unknown	13	9	Very Poor	4	1			
Other	25	Absent	34					72	72	FIA Only	1	1			
	<b>37</b>		<b>71</b>							Unknown	12	8			
											<b>49</b>	<b>44</b>			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	39.0	40.9	43.3	43.4	
	CCSM85	39.0	41.6	44.2	47.7	
	GFDL45	39.0	42.0	45.7	47.3	
	GFDL85	39.0	42.6	47.2	52.6	
	HAD45	39.0	42.2	45.2	47.0	
	HAD85	39.0	42.4	46.5	52.3	
Growing Season (May—Sep)	CCSM45	58.0	60.1	62.0	62.3	
	CCSM85	58.0	60.4	62.8	66.6	
	GFDL45	58.0	61.5	65.2	67.0	
	GFDL85	58.0	61.9	66.6	72.1	
	HAD45	58.0	61.0	63.5	65.7	
	HAD85	58.0	60.7	65.2	71.3	
Coldest Month Average	CCSM45	9.2	10.9	12.9	13.2	
	CCSM85	9.2	12.0	13.5	16.1	
	GFDL45	9.2	11.9	14.9	16.2	
	GFDL85	9.2	13.1	16.0	19.2	
	HAD45	9.2	12.2	14.9	15.6	
	HAD85	9.2	13.9	16.4	20.3	
Warmest Month Average	CCSM45	64.4	66.5	67.7	67.8	
	CCSM85	64.4	67.0	68.7	70.6	
	GFDL45	64.4	67.5	69.5	70.8	
	GFDL85	64.4	67.8	70.8	73.6	
	HAD45	64.4	67.4	68.7	70.2	
	HAD85	64.4	67.2	69.8	73.9	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	46.4	45.3	45.2	49.4	
	CCSM85	46.4	47.6	47.4	49.4	
	GFDL45	46.4	51.0	53.6	52.5	
	GFDL85	46.4	49.9	52.4	53.7	
	HAD45	46.4	50.1	52.9	52.6	
	HAD85	46.4	51.3	51.3	55.4	
Growing Season (May—Sep)	CCSM45	21.8	21.7	20.5	22.2	
	CCSM85	21.8	22.3	21.9	21.0	
	GFDL45	21.8	21.7	21.4	21.2	
	GFDL85	21.8	22.2	21.5	20.3	
	HAD45	21.8	23.5	23.4	24.9	
	HAD85	21.8	22.9	23.0	25.3	

**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-DPC30 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 M211A

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
balsam fir	Abies balsamea	NDH	High	97.9	2261.9	19.5	Lg. dec.	Lg. dec.	Low	Abundant	Poor	Poor			0	1
red spruce	Picea rubens	NDH	High	95.1	1272.5	11.7	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
sugar maple	Acer saccharum	WDH	High	81	1142.3	11.5	No change	No change	High	Abundant	Very Good	Very Good			1	3
red maple	Acer rubrum	WDH	High	94.4	1093.7	9.5	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	4
yellow birch	Betula alleghaniensis	NDL	High	92.1	998.0	9.3	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	5
paper birch	Betula papyrifera	WDH	High	92.3	759.1	7.0	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
American beech	Fagus grandifolia	WDH	High	68.6	656.0	7.6	Sm. inc.	No change	Medium	Abundant	Very Good	Good			1	7
northern white-cedar	Thuja occidentalis	WSH	High	56.7	560.3	8.3	No change	No change	Medium	Abundant	Good	Good			1	8
eastern white pine	Pinus strobus	WDH	High	42.4	277.1	4.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	9
black spruce	Picea mariana	NSH	High	24.7	263.2	9.3	No change	No change	Medium	Common	Fair	Fair			1	10
quaking aspen	Populus tremuloides	WDH	High	48.3	222.8	3.8	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	11
eastern hemlock	Tsuga canadensis	NSH	High	28.6	220.3	5.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	12
white spruce	Picea glauca	NSL	Medium	51.3	194.1	3.1	No change	Sm. inc.	Medium	Common	Fair	Good			1	13
striped maple	Acer pensylvanicum	NSL	Medium	72.6	171.7	2.0	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	14
white ash	Fraxinus americana	WDL	Medium	31.1	136.9	2.9	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	15
northern red oak	Quercus rubra	WDH	Medium	11.7	82.9	4.1	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good	Infill ++	Infill ++	1	16
bigtooth aspen	Populus grandidentata	NSL	Medium	20.5	79.5	2.7	Lg. inc.	Lg. inc.	Medium	Common	Very Good	Very Good			1	17
pin cherry	Prunus pensylvanica	NSL	Low	38.9	59.9	1.3	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	18
black cherry	Prunus serotina	WDL	Medium	16.8	40.9	1.8	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	19
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	15.5	35.9	1.4	Lg. inc.	Lg. inc.	High	Rare	Good	Good			1	20
tamarack (native)	Larix laricina	NSH	High	10.4	35.8	2.6	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	1	21
red pine	Pinus resinosa	NSH	Medium	5.1	34.4	5.6	No change	Sm. inc.	Low	Rare	Very Poor	Poor		Infill +	2	22
balsam poplar	Populus balsamifera	NSH	Medium	8	32.2	3.2	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	23
mountain maple	Acer spicatum	NSL	Low	24.7	28.3	1.0	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	24
black ash	Fraxinus nigra	WSH	Medium	15.1	25.3	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	25
gray birch	Betula populifolia	NSL	Low	9.5	18.1	1.4	No change	No change	Medium	Rare	Poor	Poor			1	26
American mountain-ash	Sorbus americana	NSL	Low	21.5	16.9	0.7	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	27
American elm	Ulmus americana	WDH	Medium	4	6.0	0.9	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	28
American basswood	Tilia americana	WSL	Medium	2.7	5.5	1.1	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good	Infill +	Infill ++	2	29
silver maple	Acer saccharinum	NSH	Low	0.2	4.3	14.2	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	30
serviceberry	Amelanchier spp.	NSL	Low	4.6	3.1	0.6	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	31
green ash	Fraxinus pennsylvanica	WSH	Low	1.6	3.0	1.4	No change	Lg. inc.	Medium	Rare	Poor	Good			2	32
jack pine	Pinus banksiana	NSH	Medium	0.1	1.1	2.3	No change	No change	High	Rare	Fair	Fair		Infill +	2	33
chokecherry	Prunus virginiana	NSLX	FIA	1.6	0.9	0.4	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	34
black locust	Robinia pseudoacacia	NDH	Low	0.2	0.7	3.0	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	35
slippery elm	Ulmus rubra	WSL	Low	0.2	0.2	1.0	Sm. dec.	Lg. inc.	Medium	Rare	Very Poor	Good			2	36
sweet birch	Betula lenta	NDH	High	0.2	0.1	0.3	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair	Infill +	Infill +	2	37
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate ++	3	38
sand pine	Pinus clausa	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	39
pitch pine	Pinus rigida	NSH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	40
loblolly pine	Pinus taeda	WDH	High	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	41
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	42
black maple	Acer nigrum	NSH	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	43
yellow buckeye	Aesculus flava	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	44
pawpaw	Asimina triloba	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown			0	45
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	46
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	47



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pinut hickory	<i>Carya glabra</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	48
pecan	<i>Carya illinoensis</i>	NSH	Low	0	0	0	Unknown	Unknown	Low	Absent	Unknown	Unknown				49
shagbark hickory	<i>Carya ovata</i>	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
mockernut hickory	<i>Carya alba</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	51
flowering dogwood	<i>Cornus florida</i>	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				52
common persimmon	<i>Diospyros virginiana</i>	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				53
silverbell	<i>Halesia spp.</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				54
black walnut	<i>Juglans nigra</i>	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	55
yellow-poplar	<i>Liriodendron tulipifera</i>	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++	3	56
Osage-orange	<i>Maclura pomifera</i>	NDH	Medium	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				57
southern magnolia	<i>Magnolia grandiflora</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				58
bigleaf magnolia	<i>Magnolia macrophylla</i>	NSL	Low	0	0	0	Unknown	Unknown	Medium	Absent	Unknown	Unknown				59
mountain or Fraser magnolia	<i>Magnolia fraseri</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				60
blackgum	<i>Nyssa sylvatica</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	61
sourwood	<i>Oxydendrum arboreum</i>	NDL	High	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				62
redbay	<i>Persea borbonia</i>	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				63
sycamore	<i>Platanus occidentalis</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				64
white oak	<i>Quercus alba</i>	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Likely +	Likely +	3	65
swamp white oak	<i>Quercus bicolor</i>	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	66
scarlet oak	<i>Quercus coccinea</i>	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	67
northern pin oak	<i>Quercus ellipsoidalis</i>	NSH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				68
chestnut oak	<i>Quercus prinus</i>	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate ++	Migrate ++	3	69
black oak	<i>Quercus velutina</i>	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	70
black willow	<i>Salix nigra</i>	NSH	Low	0	0	0	Unknown	Unknown	Low	Modeled	Unknown	Unknown				71
sassafras	<i>Sassafras albidum</i>	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	72