

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	15,618	6,030.2	508

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	21	16	Increase	8	12	Very Good	4	4	Likely	2	2
Hickory	0			Medium	22	33	No Change	13	9	Good	5	8	Infill	3	3
Maple	7	Abundant	7	Low	18	14	Decrease	18	18	Fair	11	11	Migrate	9	10
Oak	5	Common	15	FIA	5		New	18	20	Poor	10	6			
Pine	4	Rare	22				Unknown	9	7	Very Poor	8	8			
Other	25	Absent	22							FIA Only	2	2			
	44		66		66	63		66	66	Unknown	4	2			
											44	41			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	44.2	46.0	48.2	48.3	
	CCSM85	44.2	46.6	49.1	52.2	
	GFDL45	44.2	47.1	50.4	51.9	
	GFDL85	44.2	47.5	51.8	56.8	
	HAD45	44.2	47.1	50.2	51.8	
	HAD85	44.2	47.4	51.5	56.7	
Growing Season (May—Sep)	CCSM45	61.9	63.9	65.6	65.9	
	CCSM85	61.9	64.1	66.4	69.9	
	GFDL45	61.9	65.2	68.4	70.1	
	GFDL85	61.9	65.3	69.9	75.0	
	HAD45	61.9	64.7	67.4	69.6	
	HAD85	61.9	64.5	69.1	74.5	
Coldest Month Average	CCSM45	16.3	17.7	19.4	20.0	
	CCSM85	16.3	18.9	20.2	22.5	
	GFDL45	16.3	19.2	21.6	23.0	
	GFDL85	16.3	20.1	22.6	25.3	
	HAD45	16.3	18.8	21.3	21.8	
	HAD85	16.3	20.3	22.6	26.1	
Warmest Month Average	CCSM45	68.3	70.4	71.5	71.4	
	CCSM85	68.3	70.8	72.4	74.0	
	GFDL45	68.3	71.4	73.2	74.4	
	GFDL85	68.3	71.4	74.3	77.0	
	HAD45	68.3	71.2	72.6	73.9	
	HAD85	68.3	71.0	73.6	77.0	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	45.5	44.7	42.9	49.4	
	CCSM85	45.5	45.6	46.5	48.5	
	GFDL45	45.5	49.3	52.3	50.7	
	GFDL85	45.5	48.0	50.4	51.8	
	HAD45	45.5	49.0	52.7	50.6	
	HAD85	45.5	50.1	50.7	53.0	
Growing Season (May—Sep)	CCSM45	18.4	18.6	16.7	18.8	
	CCSM85	18.4	18.5	18.8	18.2	
	GFDL45	18.4	17.5	17.4	16.9	
	GFDL85	18.4	18.4	17.2	16.0	
	HAD45	18.4	19.9	20.4	20.3	
	HAD85	18.4	19.0	19.8	20.7	

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 211D

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
red maple	Acer rubrum	WDH	High	96.2	2010.7	15.2	No change	No change	High	Abundant	Very Good	Very Good			1	1
balsam fir	Abies balsamea	NDH	High	91.6	1473.2	11.2	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	2
eastern white pine	Pinus strobus	WDH	High	84.8	1301.5	11.2	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	3
eastern hemlock	Tsuga canadensis	NSH	High	73.6	1018.2	10.5	Sm. dec.	Lg. dec.	Low	Abundant	Fair	Poor			0	4
northern red oak	Quercus rubra	WDH	Medium	64.1	678.4	7.9	Sm. inc.	No change	High	Abundant	Very Good	Very Good			1	5
red spruce	Picea rubens	NDH	High	55.9	530.0	5.0	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	6
northern white-cedar	Thuja occidentalis	WSH	High	46.9	517.8	7.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	7
paper birch	Betula papyrifera	WDH	High	82.8	487.0	4.2	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	8
American beech	Fagus grandifolia	WDH	High	62.7	483.1	6.1	No change	No change	Medium	Common	Fair	Fair			1	9
white ash	Fraxinus americana	WDL	Medium	69.1	412.8	4.6	No change	No change	Low	Common	Poor	Poor			0	10
quaking aspen	Populus tremuloides	WDH	High	57.3	376.3	5.3	No change	No change	Medium	Common	Fair	Fair			1	11
sugar maple	Acer saccharum	WDH	High	55.3	315.7	4.5	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	12
yellow birch	Betula alleghaniensis	NDL	High	64.8	280.2	2.9	No change	No change	Medium	Common	Fair	Fair			1	13
bigtooth aspen	Populus grandidentata	NSL	Medium	44.4	216.5	3.8	No change	No change	Medium	Common	Fair	Fair			1	14
gray birch	Betula populifolia	NSL	Low	55.2	202.6	2.8	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	15
black cherry	Prunus serotina	WDL	Medium	35.5	172.6	3.8	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	16
white spruce	Picea glauca	NSL	Medium	37.3	140.0	2.0	Sm. dec.	No change	Medium	Common	Poor	Fair			1	17
black ash	Fraxinus nigra	WSH	Medium	29.1	116.1	2.9	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	18
black spruce	Picea mariana	NSH	High	8.2	110.7	6.7	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor	Infill +	Infill +	0	19
tamarack (native)	Larix laricina	NSH	High	21.7	90.8	3.0	Lg. dec.	Lg. dec.	Low	Common	Very Poor	Very Poor			0	20
American elm	Ulmus americana	WDH	Medium	26.5	90.7	2.8	No change	Sm. inc.	Medium	Common	Fair	Good			1	21
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	29	71.2	2.1	Sm. inc.	Sm. inc.	High	Common	Very Good	Very Good			1	22
pin cherry	Prunus pennsylvanica	NSL	Low	12.4	41.8	2.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	23
striped maple	Acer pensylvanicum	NSL	Medium	19	36.4	1.3	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	24
green ash	Fraxinus pennsylvanica	WSH	Low	7.7	27.9	3.0	No change	Sm. inc.	Medium	Rare	Poor	Fair	Infill +	Infill +	1	25
American basswood	Tilia americana	WSL	Medium	12.6	22.5	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			1	26
balsam poplar	Populus balsamifera	NSH	Medium	5.6	17.8	2.2	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	27
red pine	Pinus resinosa	NSH	Medium	5.9	17.4	2.3	No change	No change	Low	Rare	Very Poor	Very Poor			2	28
chokecherry	Prunus virginiana	NSLX	FIA	2.1	13.8	4.7	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	29
pitch pine	Pinus rigida	NSH	High	1.2	12.0	2.0	No change	Sm. dec.	Medium	Rare	Poor	Very Poor	Infill +		2	30
Scots pine	Pinus sylvestris	NSH	FIA	0.7	9.4	14.7	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	31
white oak	Quercus alba	WDH	Medium	4.3	9.0	1.7	Lg. inc.	Lg. inc.	High	Rare	Good	Good			2	32
silver maple	Acer saccharinum	NSH	Low	0.7	8.1	12.7	Sm. dec.	Sm. inc.	High	Rare	Poor	Good			2	33
Norway spruce	Picea abies	NSH	FIA	1.1	7.0	2.6	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	34
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	4.9	4.7	0.9	No change	Sm. inc.	Medium	Rare	Poor	Fair		Infill +	1	35
black oak	Quercus velutina	WDH	High	1.1	4.3	2.9	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	36
serviceberry	Amelanchier spp.	NSL	Low	5	3.8	0.7	Lg. dec.	Sm. dec.	Medium	Rare	Very Poor	Very Poor			0	37
mountain maple	Acer spicatum	NSL	Low	2.9	2.9	0.6	Sm. dec.	Lg. dec.	High	Rare	Poor	Poor			1	38
butternut	Juglans cinerea	NSLX	FIA	1.2	2.4	1.7	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	39
bur oak	Quercus macrocarpa	NDH	Medium	0.7	1.3	2.1	Very Lg. dec.	Very Lg. dec.	High	Rare	Lost	Lost			0	40
boxelder	Acer negundo	WSH	Low	0.7	1.1	1.7	No change	Lg. inc.	High	Rare	Fair	Good			2	41
Norway maple	Acer platanoides	NSL	FIA	0.3	1.0	0.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	42
swamp white oak	Quercus bicolor	NSL	Low	0.7	0.7	1.1	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good			2	43
American mountain-ash	Sorbus americana	NSL	Low	0.5	0.1	0.1	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	44
eastern redcedar	Juniperus virginiana	WDH	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	45
Virginia pine	Pinus virginiana	NDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			0	46
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Likely +	Likely +	3	47



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cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	48
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	49
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	50
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	51
flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			3	52
American holly	Ilex opaca	NSL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat			0	53
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	54
sweetgum	Liquidambar styraciflua	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	55
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	56
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	57
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	58
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat			3	59
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	60
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			0	61
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat			3	62
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++	3	63
post oak	Quercus stellata	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			0	64
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Likely +	Likely +	3	65
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	66