

Current and Potential Future Habitat, Capability, and Migration

	sq. km	sq. mi	FIA Plots
Area of Region	13,434	5,186.9	517

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	17	18	Increase	14	15	Very Good	3	3	Likely	0	0
Hickory	0			Medium	22	30	No Change	5	5	Good	8	10	Infill	3	7
Maple	5	Abundant	8	Low	20	14	Decrease	14	13	Fair	10	10	Migrate	4	14
Oak	1	Common	13	FIA	4		New	21	24	Poor	8	7		7	21
Pine	3	Rare	16				Unknown	9	6	Very Poor	4	2			
Other	25	Absent	26							FIA Only	3	3			
	37		63		63	62		63	63	Unknown	5	2			
											41	37			

Potential Changes in Climate Variables

Temperature (°F)

	Scenario	2009	2039	2069	2099	
Annual Average	CCSM45	41.9	43.8	46.0	46.1	
	CCSM85	41.9	44.4	47.0	50.3	
	GFDL45	41.9	44.8	48.4	50.0	
	GFDL85	41.9	45.4	49.9	55.0	
	HAD45	41.9	45.0	48.0	49.7	
	HAD85	41.9	45.3	49.4	54.8	
Growing Season (May—Sep)	CCSM45	60.6	62.6	64.4	64.7	
	CCSM85	60.6	62.9	65.2	68.9	
	GFDL45	60.6	64.0	67.4	69.1	
	GFDL85	60.6	64.1	68.8	74.0	
	HAD45	60.6	63.4	66.0	68.1	
	HAD85	60.6	63.2	67.7	73.4	
Coldest Month Average	CCSM45	12.5	14.0	15.8	16.3	
	CCSM85	12.5	15.2	16.7	19.1	
	GFDL45	12.5	15.3	18.2	19.5	
	GFDL85	12.5	16.3	19.2	22.1	
	HAD45	12.5	15.4	17.9	18.7	
	HAD85	12.5	16.8	19.4	22.9	
Warmest Month Average	CCSM45	67.2	69.2	70.4	70.4	
	CCSM85	67.2	69.7	71.4	73.2	
	GFDL45	67.2	70.3	72.1	73.4	
	GFDL85	67.2	70.2	73.3	76.0	
	HAD45	67.2	70.2	71.4	72.8	
	HAD85	67.2	70.0	72.5	76.2	

Precipitation (in)

	Scenario	2009	2039	2069	2099	
Annual Total	CCSM45	44.6	44.3	43.2	49.2	
	CCSM85	44.6	46.2	45.8	47.4	
	GFDL45	44.6	48.7	51.9	50.2	
	GFDL85	44.6	48.2	50.1	51.4	
	HAD45	44.6	48.2	52.2	51.0	
	HAD85	44.6	48.4	49.7	52.6	
Growing Season (May—Sep)	CCSM45	18.7	18.8	17.5	19.7	
	CCSM85	18.7	19.8	19.3	18.3	
	GFDL45	18.7	18.0	18.3	17.5	
	GFDL85	18.7	18.9	18.2	16.8	
	HAD45	18.7	20.4	20.7	21.5	
	HAD85	18.7	19.1	20.4	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 211B

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	97.7	2011.4	14.0	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	1
northern white-cedar	Thuja occidentalis	WSH	High	87.3	1329.9	10.8	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	2
red maple	Acer rubrum	WDH	High	97.8	1280.2	9.1	Sm. inc.	Sm. inc.	High	Abundant	Very Good	Very Good			1	3
red spruce	Picea rubens	NDH	High	92.4	1172.3	8.6	Sm. dec.	Sm. dec.	Low	Abundant	Fair	Fair			0	4
eastern hemlock	Tsuga canadensis	NSH	High	86.5	1076.4	9.3	No change	Sm. dec.	Low	Abundant	Fair	Fair			0	5
American beech	Fagus grandifolia	WDH	High	68.7	829.2	7.9	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	6
eastern white pine	Pinus strobus	WDH	High	73.9	699.3	6.8	Sm. inc.	Sm. inc.	Low	Abundant	Good	Good			1	7
yellow birch	Betula alleghaniensis	NDL	High	87.5	590.6	4.4	Sm. dec.	Sm. dec.	Medium	Abundant	Fair	Fair			0	8
sugar maple	Acer saccharum	WDH	High	57.7	387.4	4.3	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	9
paper birch	Betula papyrifera	WDH	High	86.6	380.8	2.9	No change	No change	Medium	Common	Fair	Fair			1	10
black spruce	Picea mariana	NSH	High	34.9	364.5	8.3	Sm. dec.	Sm. dec.	Medium	Common	Poor	Poor			0	11
quaking aspen	Populus tremuloides	WDH	High	57.6	328.9	3.7	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	12
white spruce	Picea glauca	NSL	Medium	54.2	203.7	2.3	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	13
bigtooth aspen	Populus grandidentata	NSL	Medium	43.8	199.5	3.1	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	14
white ash	Fraxinus americana	WDL	Medium	50.7	197.5	2.4	Lg. inc.	Lg. inc.	Low	Common	Good	Good			1	15
gray birch	Betula populifolia	NSL	Low	51.6	155.1	2.5	Sm. inc.	Sm. inc.	Medium	Common	Good	Good			1	16
striped maple	Acer pensylvanicum	NSL	Medium	50.8	132.4	1.7	Lg. dec.	Lg. dec.	Medium	Common	Poor	Poor			0	17
tamarack (native)	Larix laricina	NSH	High	26.9	109.1	2.8	No change	No change	Low	Common	Poor	Poor			0	18
black ash	Fraxinus nigra	WSH	Medium	30.1	87.4	1.6	Sm. inc.	Sm. inc.	Low	Common	Fair	Fair			1	19
red pine	Pinus resinosa	NSH	Medium	10.5	84.4	5.4	No change	No change	Low	Common	Poor	Poor	Infill +	Infill +	0	20
eastern hophornbeam; ironw	Ostrya virginiana	WSL	Low	29.6	55.9	1.2	Lg. inc.	Lg. inc.	High	Common	Very Good	Very Good			1	21
balsam poplar	Populus balsamifera	NSH	Medium	11.4	37.3	1.9	Lg. dec.	Lg. dec.	Medium	Rare	Very Poor	Very Poor			0	22
American elm	Ulmus americana	WDH	Medium	14.8	36.0	1.3	Lg. inc.	Lg. inc.	Medium	Rare	Good	Good	Infill ++	Infill ++	1	23
pin cherry	Prunus pensylvanica	NSL	Low	30.5	33.4	0.9	Lg. dec.	Very Lg. dec.	Medium	Rare	Very Poor	Lost			0	24
northern red oak	Quercus rubra	WDH	Medium	11.8	29.8	2.0	Lg. inc.	Lg. inc.	High	Rare	Good	Good	Infill ++	Infill ++	1	25
black cherry	Prunus serotina	WDL	Medium	11.8	24.6	1.2	Lg. inc.	Lg. inc.	Low	Rare	Fair	Fair			1	26
silver maple	Acer saccharinum	NSH	Low	0.8	14.4	19.4	Sm. dec.	No change	High	Rare	Poor	Fair		Infill +	2	27
Norway spruce	Picea abies	NSH	FIA	1.6	13.3	5.8	Unknown	Unknown	NA	Rare	NNIS	NNIS			0	28
mountain maple	Acer spicatum	NSL	Low	10.8	10.0	0.7	Lg. dec.	Lg. dec.	High	Rare	Poor	Poor			1	29
jack pine	Pinus banksiana	NSH	Medium	0.1	9.0	2.1	Sm. dec.	Sm. dec.	High	Rare	Poor	Poor			0	30
American basswood	Tilia americana	WSL	Medium	4.3	6.4	0.8	No change	Lg. inc.	Medium	Rare	Poor	Good		Infill ++	2	31
American chestnut	Castanea dentata	NSLX	FIA	0.8	4.1	5.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	32
green ash	Fraxinus pennsylvanica	WSH	Low	1.4	3.6	0.3	Sm. inc.	Lg. inc.	Medium	Rare	Fair	Good		Infill ++	2	33
butternut	Juglans cinerea	NSLX	FIA	0.1	2.5	0.3	Unknown	Unknown	Low	Rare	FIA Only	FIA Only			0	34
chokecherry	Prunus virginiana	NSLX	FIA	1.7	1.6	0.6	Unknown	Unknown	Medium	Rare	FIA Only	FIA Only			0	35
American mountain-ash	Sorbus americana	NSL	Low	0.6	1.4	1.4	Lg. dec.	Lg. dec.	Low	Rare	Very Poor	Very Poor			0	36
serviceberry	Amelanchier spp.	NSL	Low	2.3	1.3	0.6	Sm. dec.	No change	Medium	Rare	Very Poor	Poor		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
boxelder	Acer negundo	WSH	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	39
sweet birch	Betula lenta	NDH	High	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	40
cittamwood/gum bumelia	Sideroxylon lanuginosum ssp.	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown			0	41
American hornbeam; musclev	Carpinus caroliniana	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	42
bitternut hickory	Carya cordiformis	WSL	Low	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +	3	43
pignut hickory	Carya glabra	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +	3	44
shagbark hickory	Carya ovata	WSL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate +	3	45
mockernut hickory	Carya alba	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat			3	46
hackberry	Celtis occidentalis	WDH	Medium	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat			0	47



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flowering dogwood	Cornus florida	WDL	Medium	0	0	0	Unknown	New Habitat	Medium	Absent	Unknown	New Habitat				0	48
common persimmon	Diospyros virginiana	NSL	Low	0	0	0	Unknown	New Habitat	High	Absent	Unknown	New Habitat				0	49
black walnut	Juglans nigra	WDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	50
yellow-poplar	Liriodendron tulipifera	WDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat				3	51
blackgum	Nyssa sylvatica	WDL	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate +		3	52
redbay	Persea borbonia	NSL	Low	0	0	0	Unknown	Unknown	High	Absent	Unknown	Unknown				0	53
sycamore	Platanus occidentalis	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				0	54
white oak	Quercus alba	WDH	Medium	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	55
swamp white oak	Quercus bicolor	NSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	56
scarlet oak	Quercus coccinea	WDL	Medium	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	57
overcup oak	Quercus lyrata	NSL	Medium	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0	58
pin oak	Quercus palustris	NSH	Low	0	0	0	New Habitat	New Habitat	Low	Absent	New Habitat	New Habitat				0	59
chestnut oak	Quercus prinus	NDH	High	0	0	0	New Habitat	New Habitat	High	Absent	New Habitat	New Habitat		Migrate ++		3	60
black oak	Quercus velutina	WDH	High	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat	Migrate +	Migrate ++		3	61
black locust	Robinia pseudoacacia	NDH	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat		Migrate +		3	62
sassafras	Sassafras albidum	WSL	Low	0	0	0	New Habitat	New Habitat	Medium	Absent	New Habitat	New Habitat				3	63